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Industry Profiles

Catalog of Investment Information and Opportunities

Volume VI

Office of Development Finance and Private Enterprise
Agency for International Development
Washington, DC 20523

Catalog of Investment Information and Opportunities
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INDUSTRY PROFILES

STRETCH SOCKS FOR MEN AND CHILDREN

I. P. No. 67251
S. I. C. 2252

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67251
S.I.C. 2252
DECEMBER 1967

STRETCH SOCKS FOR MEN AND CHILDREN

PRODUCT DESCRIPTION

Socks made from stretch yarns. Fewer sizes of socks are required for both men and children since the stretch factor in the yarn compensates for the many sizes required in socks knitted of non-stretch yarns.

A. GENERAL EVALUATION OF PROSPECTS

Prospects for the consumption of stretch socks should be good in all countries where all the population wears shoes and socks. Stretch socks are a relatively new product and, because of the fact that they are made of synthetic fibers, and because of their stretch qualities, they usually outwear most other types of socks. Capital requirements for this industry are fairly moderate in comparison with the gross sales volume and only two skilled workers are required. If adequate gross sales potential exists within the country, this industry should be given full consideration for investment.

B. MARKET ASPECTS

1. USERS

Men and children.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to retail stores and department stores that sell this product. In some cases, sales might be made to wholesalers. The demand for this product depends on the percentage of population that wears shoes and socks. This product is light and well packaged. The potential market should be nationwide if adequate transportation facilities exist. This plant should be able to compete with imported stretch socks particularly if materials are available locally for their manufacture. A plant of this size would find it difficult to compete worldwide with large mass production plants but might be able to export to neighboring countries not having a plant of this kind or capacity.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in devloping countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufacturered product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $180,000.
The total fixed investment, plus working capital, is estimated at $120,600.
The annual gross profit, before Federal taxes, is estimated at $12,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 6.7%.
(A gross profit on sales, before taxes, of 6.7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, would amount to about 10.8%.

5. COST PER MAN EMPLOYED

Eleven direct and five indirect workers, or a total of sixteen workers, are employed.
The total fixed capital investment is estimated at $82,200.
Based on these figures, the fixed investment per man employed would amount to about $5,137.

C. PRODUCTION REQUIREMENTS STRETCH SOCKS FOR MEN AND CHILDREN

I.P. No. 67251
S.I.C. 2252

ANNUAL CAPACITY - ONE SHIFT OPERATION: 34,000 DOZEN PAIRS
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land 10,000 sq. ft.	
Building - 30'x100' one story	
Any suitable local material may be used	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 82,000

Principal items:
12 Knitting Machines, 2 Loopers, 2 Washing and Dyeing Machines, Extractor, 2 Turning Boards, 2 Boarding Tables, Boarding Toes, Racks, Tables, Piping, Wiring, Steam Generator, Chairs, Bins, Trucks, Plant Maintenance Equipment, Printing Dies and Tools

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 38,400

c. Total Capital Requirements $ 120,600

2. MATERIALS AND SUPPLES

a. Direct materials	Annual Requirements	Annual Cost
Stretch yarn	34,000 lbs.	
Dyes	5,000 lbs.	
Finishing materials (Decalcomania & Labels)		
Shipping boxes		
Total direct materials		$ 46,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 2,600

c. Availability of materials & supplies
Stretch yarn may have to be imported if there is no nylon (or other man-made fiber) plant in the country. Needles and dyes may also have to be imported.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - About 25 H.P. connected load	
Fuel - For heating and process steam.	
Water - Small amount for production, sanitation, and fire protection	$ 1,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,700

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager (and clerical)	2	
Maintenance	1	
Janitor	1	
Truck Driver	1	
Total indirect labor	5	$ 28,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	4	
Unskilled workers	5	
Total direct labor	11	$ 52,000

c. Training Needs
The manager must be fully experienced. He and two skilled workers should be able to train the other workers and reach full production in one month.

6. TRANSPORTATION

a. Own transport equipment
Truck

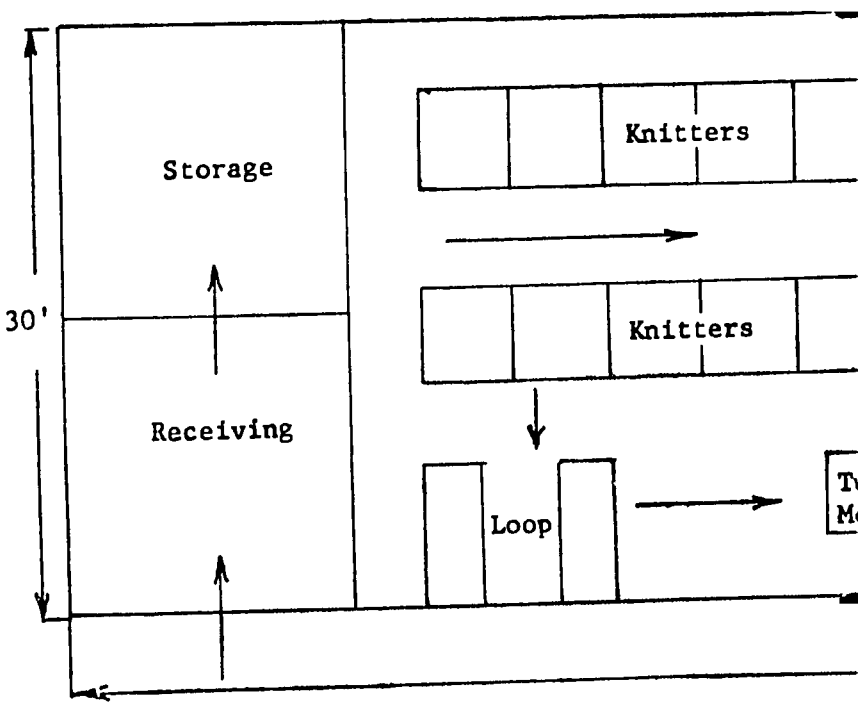
b. External transport facilities
In and out shipments average less than 400 pounds per day.
Good highways should be available.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 46,000	
Direct labor	52,000	
Manufacturing overhead*	39,000	
Total manufacturing cost		$ 137,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 12,700
Sales expense		$ 10,000
Freight-out, travel, discounts, Allowances & bad debts		$ 8,000
Total annual costs		$ 168,000
Annual Gross Profit		$ 12,000
ANNUAL SALES REVENUE		$ 180 000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

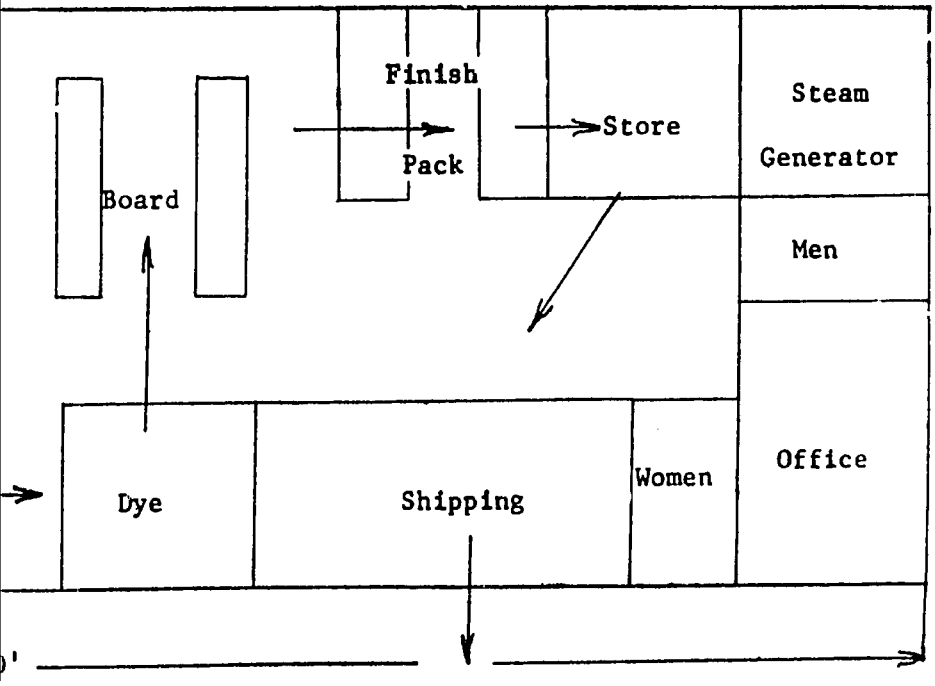
PLANT L



N AND CHILDREN

I. P. NO. 67251
S.I.C. 2252

WORKFLOW



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STRETCH SOCKS FOR MEN AND CHILDREN

SELECTED REFERENCES

TECHNICAL AND TRADE BOOKS

A. Principles of Knitting. Volume I, General. Volume II, Circular. W. E. Shinn. $5.00 each volume.

Textile Book Service
257 Park Avenue, South
New York, New York 10010

B. Warp Knitting Technology. D. F. Paling. $3.25

Textile Book Service
257 Park Avenue, South
New York, New York 10010

Technology of machine warp knitting.

TECHNICAL AND TRADE PERIODICALS

A. Textile World. Monthly. $2.00/year.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Devoted to the textile industry.

B. Apparel Manufacturer. Monthly. $5.00/year.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U.S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each

A. Patent No. 3,196,640. July 1965. 6 p.
Stretch hosiery.

B. Patent No. 3,146,468. September 1964. 3 p.
Sock construction.

C. Patent No. 3,142,947. August 1964. 8 p.
Method of knitting hosiery.

D. Patent No. 3,128,763. April 1964. 4 p.
Stockings with special toe construction.

E. Patent No. 3,015 942. January 1962. 3 p.
Circular knit hosiery and method of forming foot of same.

F. Patent No. 2,987,898. 1961. 10 p.
Circular stocking making machine of the axially opposed double cylinder type.

G. Patent No. 2,979,927. 1960. 10 p.
Knitting machine for circular articles including men's socks.

H. Patent No 2,959,040. 1960. 15 p.
Socks making machine of the superimposed needle cylinder type.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Textile Processors Guild
51 Chambers Street
New York, New York 10007

B. American Apparel Manufacturers Association
2000 "K" Street, N. W.
Washington, D. C.

VI. DIRECTORIES

A. American Apparel Manufacturers Association - Directory of members and associate members. Annual. $15.00

American Apparel Manufacturers Association
2000 "K" Street, N. W.
Washington, D. C. 20006

Data on 500 member firms, personnel, purchasing agents, plants, suppliers to the apparel manufacturing trade.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

TOILET SEATS AND LIDS

I. P. No. 67252
S. I. C. 2499

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The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

TOILET SEATS AND LIDS

PRODUCT DESCRIPTION

Toilet seats and lids, both made of wood, complete with hardware for installation and painted in various colors.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend to a great extent on the water supply available. Where water is available for the operation of toilets, potential sales should exist for this product. The capital requirements for this plant are fairly moderate in comparison with the estimated profits on gross sales. Only two skilled workers are required. Therefore, if an adequate supply of suitable lumber (kiln-dried hardwood) is available locally for manufacturing the seats and water is available for toilet operation, prospects should be good.

B. MARKET ASPECTS

1. USERS

Homes, stores, office buildings, schools, institutions, hotels, public places--wherever toilets are required.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to wholesalers of plumbing supplies. The potential market will depend upon an adequate supply of water and a fairly high per capita income of the local population. In some countries, water may not be available for toilet operation in agricultural areas. In other countries, even urban areas may suffer from inadequate water supplies. This industry cannot successfully be operated on a small basis. Unless other industries within the country are already manufacturing toilet seats and lids, there should be no domestic competition. A plant of the capacity envisioned in this profile would not be able to compete in world markets but export to friendly neighboring countries may prove feasible.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $250,000.
The total fixed investment, plus working capital, is estimated at $127,500.
The annual gross profit, before taxes, is estimated at $18,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.2%.
(A gross profit on sales, before taxes, of 7.2%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 14.1%.

5. COST PER MAN EMPLOYED

Eleven direct and six indirect workers, or a total of seventeen workers, are employed.
The total fixed capital investment is estimated at $85,000.
Based on these figures, the fixed investment per man employed would amount to $5,000.
The cost of tables, benches, bins, racks, hand tools, hand trucks, or pallets required usually may be reduced by making or purchasing such items locally.

C. PRODUCTION REQUIREMENTS TOILET SEATS AND LIDS — I. P. No. 67252
ANNUAL CAPACITY - ONE SHIFT OPERATION : 150,000 WOODEN SEATS WITH LIDS — S.I.C. 2499

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 1 acre	
Building - 60' x 80' or 4,800 sq. ft. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 85,000

Principal Items :

Cut-off Saw, Jointer, Planer, Ripsaw, Glue Jointer, Shaper, Automatic Seat Shaper, Band Saw, Trim Saw, Boring Machine, Blue Reels, 2 Sanders, Glue Pots, Spray Booth, Air Compressor

b. Working Capital (30 days)	
Direct Materials	
Direct Labor	
Manufacturing Overhead	
Administrative Costs	
Sales Costs,	
Freight-out, discounts, bed debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 42,500
c. Total Capital Requirements	$127,500

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Hardwood lumber	500,000 board feet	
Fittings	150,000 sets	
Paint		
Cartons		
Total direct materials		$ 80,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,400

Availability of materials & supplies

All materials should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
a. Electric Power - Yes	
Fuel	
Water	
	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,600

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Foreman	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 43,000
b. Direct Labor		
Skilled workers	2	
Semi-skilled workers	4	
Unskilled workers	5	
Total direct labor	11	$ 50,000

c. Training Needs.

The manager must be fully experienced. He and two skilled workers should be able to train the other workers and reach full production within thirty days.

6. TRANSPORTATION

a. Own Transport Equipment.

Truck

b. External Transport Facilities.

Product is well packaged.
Good highways.
Railroad if possible.

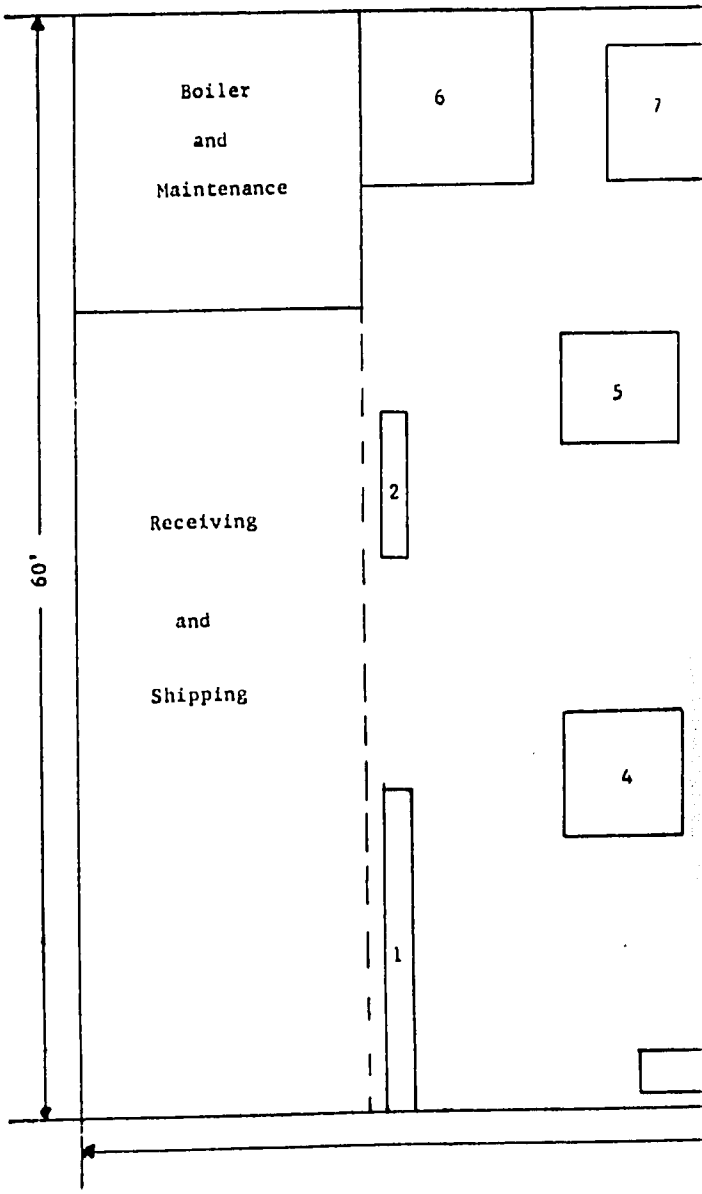
7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 80,000	
Direct labor	50,000	
Manufacturing Overhead*	55,300	
Total manufacturing cost		$185,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 20,700
Sales expense		18,000
Freight-out, travel discounts		
Allowance & bad debts		$ 8,000
Total annual costs		$232,000
Annual Gross Profit		$ 18,000
ANNUAL SALES REVENUE		$250,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect Labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

TOILET SE

PLANT LAYOU

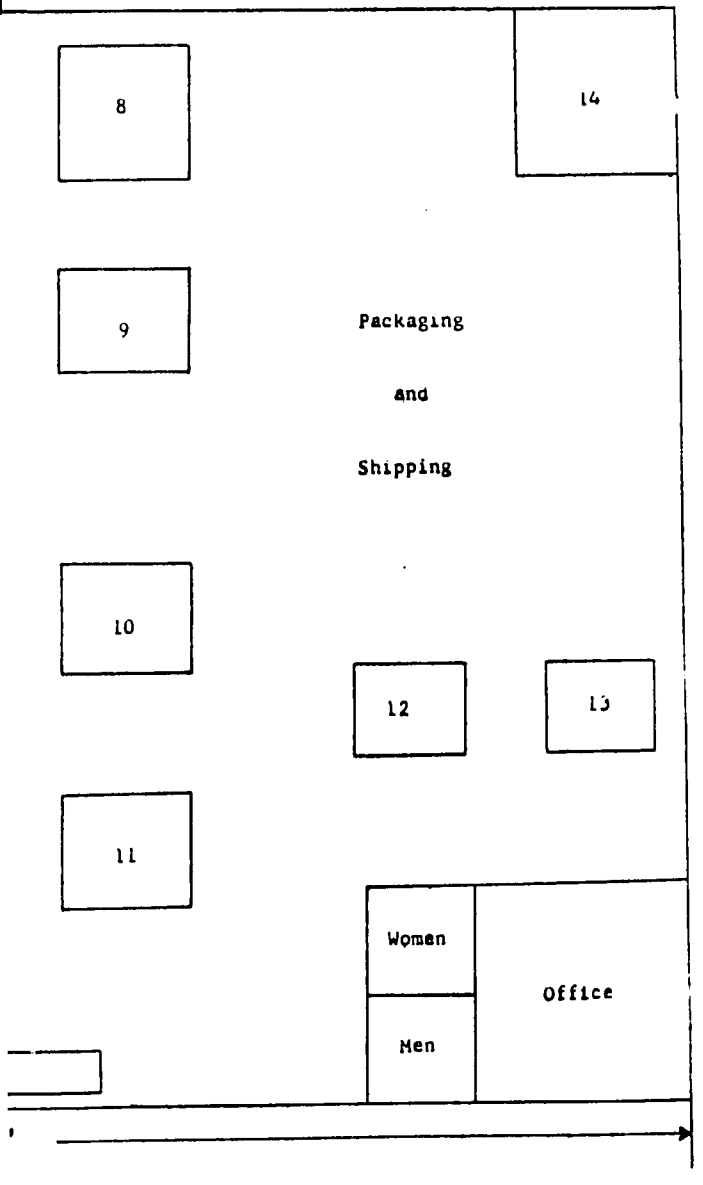


1	Cutoff saw	5	Glue Jointer	9	
2	Jointer	6	Glue Reel	10	
3	Ripsaw	7	Trim Saw	11	
4	Planer	8	Bandsaw	12	

I. P. NO. 67252
S. I. C. 2499

ND LIDS

ORKFLOW



13 Sander
14 Spray Booth

ic Seat Shaper
Machine

I. P. No. 67252
S. I. C. 2499

TOILET SEATS AND LIDS

SELECTED REFERFNCES

I. TECHNICAL AND TRADE BOOKS

A. General Woodworking. 3rd Edition. C. H. Groneman. 1965. 256 pp. Illus. $7.25

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Machine tool processes, hand tool processes, portable tool processes, and related woodworking information.

B. Wood Machining Processes. Peter Koch. 1964. 530 pp. Illus. $15.00

The Ronald Press Company
15 East 26th Street
New York, New York 10010

Guide to basic facts, methods and relationships that govern wood machining processes.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company
Wheaton, Illinois 60188

Covers the major branches of the woodworking industry.

B. Plumbing-Heating-Cooling Business. Monthly. Free to members of :

National Association of Plumbing, Heating, Cooling Contractors
1016, 20th Street, N.W.
Washington, D.C. 20036

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better desisions in the future.

C. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,219,777. October 1965 3 p.
Dual seat assembly for flush type toilet.

B. Patent No. 3,153, 248. October 1964 3 p.
Toilet seat construction.

C. Patent No. 2,928,104. 1960, 3 p.
Antularly adjustable toilet seat.

D. Patent No. 2,839,764. 1958. 3 p.
Toilet seat hinged cover.

E. Patent No. 2,575,208. 1951. 5 P.
Simple Toilet seat.

F. Patent No. 2,550,221. 1951. 4 p.
Toilet Seat.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Woodworking Machinery Manufacturers Association
1900 Arch Street
Philadelphia, Pennsylvania 19103

B. Plumbing Fixture Manufacturers Association
1145 - 19th Street, N. W.
Washington, D. C. 20036

VI. DIRECTORIES

A Hichcock's Woodworking Directory and Handbook. Annual. $15.00
Hichcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers and suppliers for the woodworking industries.

VII. PROFESSIONAL ENGINEERING SERVICE

The Services of the professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice of those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

DEHYDRATED BLACKSTRAP MOLASSES

I. P. No. 67253
S. I. C. 2061

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67253
S.I.C. 2061
DECEMBER 1967

DEHYDRATED BLACKSTRAP MOLASSES

PRODUCT DESCRIPTION

Dehydrated blackstrap molasses.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend on two principal factrs: one, the local availability of blackstrap molasses and, two, the sales potential for the product both locally and in the export market. Blackstrap molasses will not be available unless a sugar refinery exists within the country.

The gross profit before taxes for this plant is good. However, the capital requirements exceed the annual gross sales. A comprehensive survey should be conducted before making an investment in this industry. Only under ideal conditions should an investment in this plant be warranted.

B. MARKET ASPECTS

1. USERS

Other industries, particularly food and confectionary industries.

2. SALES CHANNELS AND METHODS

Sales would be made direct to other industries. Since this product is light and well packaged the extent of the market would be nationwide. Normally a plant of this production capacity would not be able to enter the export market. If exporting is considered, however, a careful study of the world markets available should be undertaken. This industry can be operated on a fairly small scale; therefore, the domestic market could be highly competitive. A survey of the local market should be made.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $85,000.
The annual gross profit, before taxes, is estimated at $7,000.
The total capital requirements, including working capital, amount to $131,300.
Based on these figures, the annual profit on gross sales, before taxes, amounts to about 8.2%.
(A gross profit on sales, before taxes, of 8.2%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)

The annual profit on the total capital requirements, before taxes, amounts to about 5.3%.

5. COST PER MAN EMPLOYED

Three direct workers and three indirect workers, or a total of six workers are employed.
The total fixed capital investment is estimated at $118,000.
Based on these figures, the fixed investment per man employed would amount to about $19,700.

C. PRODUCTION REQUIREMENTS DEHYDRATED BLACKSTRAP MOLASSES
ANNUAL CAPACITY - ONE SHIFT OPERATION : 1,250 METRIC TONS I.P. No. 67253
S.I.C. 2061

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 1 acre	
Building - 6,000 sq. ft. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$118,000

Principal Items :

Drying Chamber, 4 Cyclones, Air Heater, Spray Nozzle Assembly, Piping, Tower Feed Pump, Feed Strainer, Feed Preheater, 2 Centrifugal Fans with Drive, Connecting Duct Work, Instruments

These plants are usually purchased, completely installed, on a turnkey basis.

b. Working Capital (30 days)	
Direct Materials	
Direct Labor	
Manufacturing Overhead	
Administrative Costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 13,300
c. Total Capital Requirements	$131,300

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Blackstrap molasses		
Packaging material		
Total direct materials		$ 8,500

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,400

. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
a. Electric Power - 480 kilowatt hours per day Fuel - 11,250 gallons of light fuel oil required annually Water - Sanitation and fire protection	$ 3,400

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 10,200

5 MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Office	1	
Truck Driver	1	
Total indirect labor	3	$ 21,000
b. Direct Labor		
Skilled workers	1	
Semi-skilled workers	1	
Unskilled workers	1	
Total direct labor	3	$ 15,000

c. Training Needs.

The manager should be fully experienced. He and one skilled worker should be able to train other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own Transport Equipment.

Truck

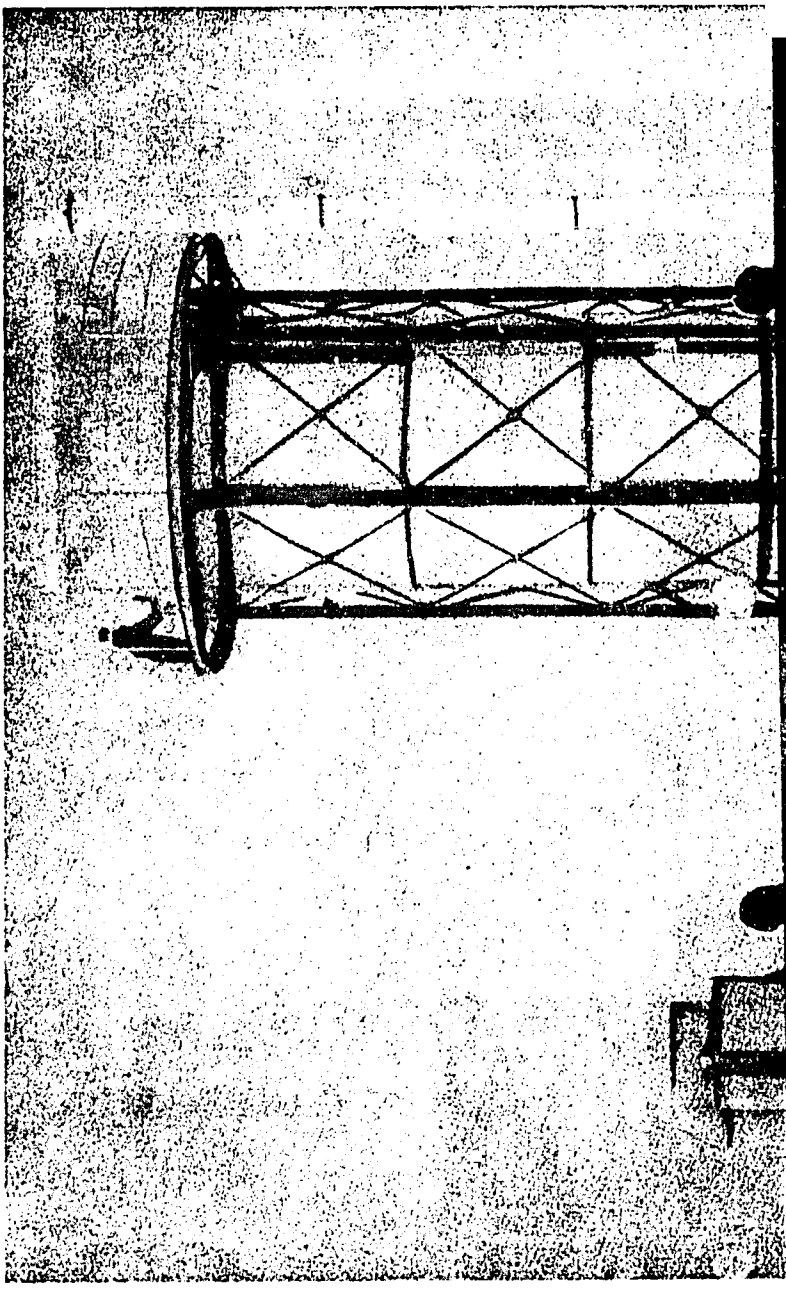
b. External Transport Facilities.

In and out shipments average about 10 tons per day.
Good highways are essential.

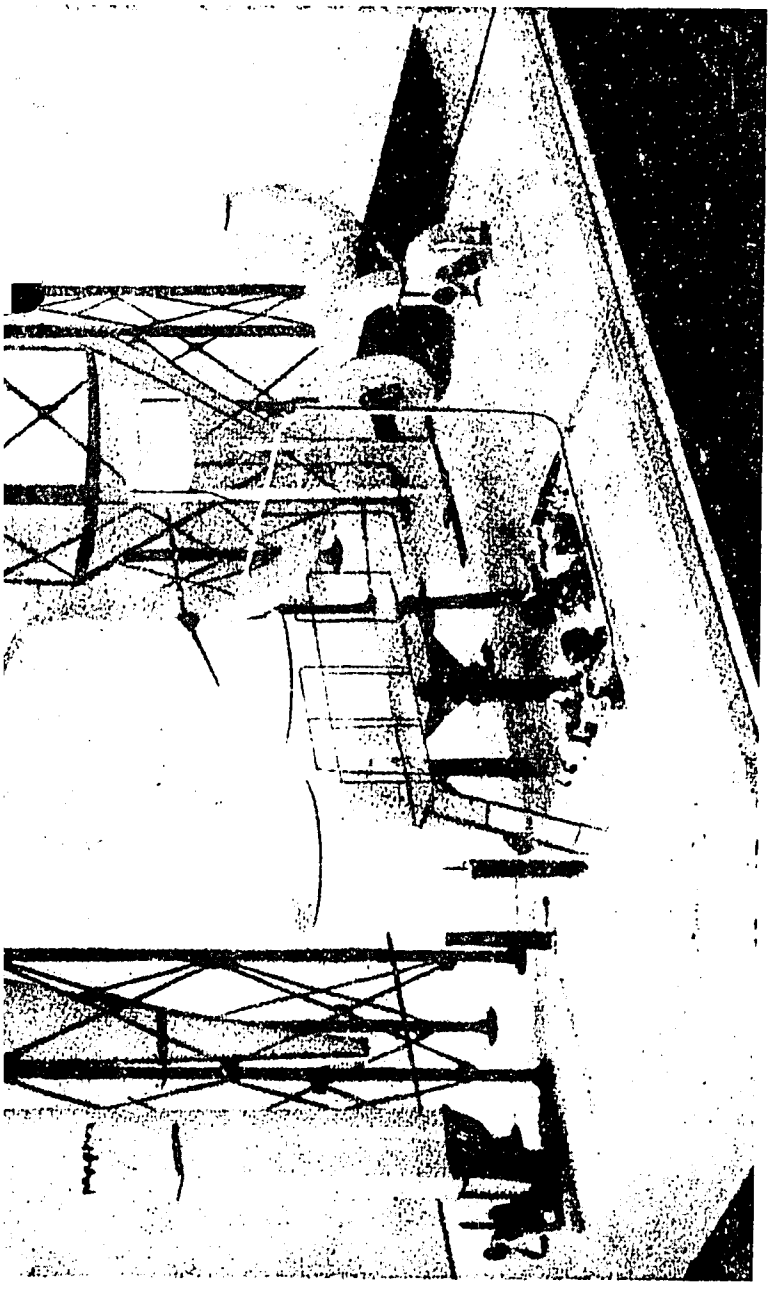
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 8,500	
Direct labor	15,000	
Manufacturing Overhead*	39,000	
Total manufacturing cost		$ 62,500
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 7,500
Sales expense		$ 6,000
Freight-out, travel discounts Allowance & bad debts		$ 2,000
Total annual costs		$ 78,000
Annual Gross Profit		$ 7,000
ANNUAL SALES REVENUE		$ 85,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect Labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.



STRAP MOLASSES



Model of a Spray Dryer

DEHYDRATED BLACKSTRAP MOLASSES
SELECTED REFERENCES

I.P. No. 67253
S.I.C. 2061

I. TECHNICAL AND TRADE BOOKS

A. Food Dehydration. Volume I. Principles. W.B. Van Arsdel. 1963. $10.00. Volume II, Products and Technology. W.B. Van Arsdel and M.H. Copley. 1964. 732 pp. 161 Illus. $22.50.

AVI Publishing Company
P.O. Box 388
Westport, Connecticut 06881

B. Quality Control and Reliability. Norbert L. Enrick. 1966. 5th Ed. 254 pp. $7.50.

The Industrial Press
93 Worth Street
New York, New York 10013

Covers basic quality control applications, methods and reliability.

C. Federal Food, Drug, and Cosmetic Act, as amended. General Regulations for its Enforcement, Title 21, Part 1, $3.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

II. TECHNICAL AND TRADE PERIODICALS

A. Food Engineering. Monthly. $25.00/year.

Chilton Publishing Company
Chestnut & 56th Streets
Philadelphia, Pennsylvania 19139

Devoted to all kinds of food engineering.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20.

Small Business management Series No. 4
U.S. Government Printing Office
Washington, D.C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00.

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Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

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Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisiosn in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,103,439. September 10, 1963 6 p.
Dehydration process and product.

B. Patent No. 2,991,179. July 4, 1961. 4 p.
Method of and means for dehydrating flowable matter.

C. Patent No. 2,801,174. July 30, 1952 2 p.
Process of dehydrating molasses.

D. Patent No. 3,241,981. March 1966. 8 p.
Continuous dehydration of edible liquids.

E. Patent No. 3,209,812. October 1965. 3 p.
Apparatus for removing water from liquid mixtures.

F. Patent No. 3,194,670. July 1965. 3 p.
Method for dehydrating food.

G. Patent No. 2,627,106. 1961. 2 p.
Method of dehydrating viscous materials such as molasses.

H. Patent No. 2,801,174. 1957. 2 p.
Process for dehydrating molasses.

I. Patent No. 2,707,151. 1956. 3 p.
Process for dehydrating molasses.

J. Patent No. 2,556,111. 1951. 3 p.
Process for preparing dried molasses.

K. Patent No. 2,333,638. 1943. 2 p.
Process of packaging dried molasses.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Dehydrators Association
Board of Trade Building
800 W. 47th Street
Kansas City, Missouri 64112

VI. DIRECTORIES

No suitable directory available on the subject of dehydrated molasses.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

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INNERSPRING MATTRESSES AND BOX SPRINGS

I. P. No. 67254
S. I. C. 2515

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I. P. No. 67254
S. I. C. 2515
DECEMBER 1967

INNERSPRING MATTRESSES AND BOX SPRINGS

PRODUCT DESCRIPTION

Innerspring tape edge and rolled edge mattresses and box springs. Each mattress will contain one innerspring unit, two sisal pads and cotton batting. These will be covered with ticking and will be supplied with fittings such as ventilators, handles and button tufts. Each box spring will contain a wooden frame with innersprings fastened to the frame, one sisal pad and cotton batting. The top and sides will be covered with ticking. It will also be supplied with fittings and the bottom will be covered with cambric. Both the mattresses and the box springs will be made in two sizes : 38" x 74" and 54" x 74".

A. GENERAL EVALUATION OF PROSPECTS

The mattresses and springs manufactured in this plant are intended for use by the better hotels and families with substantial income. Both the cotton and the ticking should be available in countries where cotton is grown. The innerspring units may have to be imported. However, these units are shipped in tightly compressed bundles which greatly reduce the freight rates. The gross profit, before taxes, is good in comparison with the capital requirements. Prospects for this industry depend on the sales potential within the country because a plant of this size could not compete with mass-production plants in world markets.

B. MARKET ASPECTS

1. USERS

Better hotels, military officers' quarters, homes of families with high level income.

2 SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to furniture stores, department stores, hotels and the military. The level of income of the local population will determine the size of market. When income is adequate, shipments and sales could be nationwide. Mattresses are bulky and should be packaged well if long-distance shipment is made. The selling price is high enough to permit long-distance transportation. The production of innerspring mattresses and box springs cannot be undertaken without considerable investment in equipment and materials. Unless other plants of this kind are already in operation, no serious domestic competition should exist. If raw materials are available locally, this plant should have no difficulty competing against import.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 440,000.
The total fixed investment, plus working capital, is estimated at $ 182,700.
The annual gross profit, before taxes, is estimated at $ 40,000.
Using these figures, the profit on gross sales, before taxes, amounts to 9.1%.
(A gross profit on sales, before taxes, of 9.1%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 22.37%.

5. COST PER MAN EMPLOYED

Thirteen direct workers and six indirect workers, or a total of nineteen workers, are employed.
The total fixed capital investment is estimated at $ 110,000.
Based on these figures, the fixed investment per man employed would amount to about $ 5,800.

C. PRODUCTION REQUIREMENTS INNERSPRING MATTRESSES AND BOX SPRINGS

I.P. No. 67254
S.I.C. 2515

ANNUAL CAPACITY - ONE SHIFT OPERATION : 6,000 TAPE EDGE MATTRESSES, 6,000 ROLL EDGE MATTRESSES, AND 8,000 BOX SPRINGS

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 1/2 acre	
Building - one story 100' x 100' Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 110,000

Principal items :

Cotton Picker, Carding Machine, Power Filler, Roll Edge Machine, Scales, 2 Tape Edge Machines, Button Tufter, Cutting Table, Sewing Table, 5 Sewing Machines, Electric Cloth Cutter, Electric Cloth Drill, Ticking Racks, 2 Box Spring Tables, Packing Table, Rip Saw, Delivery Truck

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 72,700

c. Total Capital Requirements $ 182,700

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Cotton linters	400,000 lbs.	
Sisal pads	32,000	
Tape edge boxing	8,000 sets	
Ticking	120,000 yds.	
Innerspring units	12,000	
Box spring lumber	72,000 bd. ft.	
Cambric	18,000 yds.	
Fittings		
Packaging		
Box spring units	8,000	
Total direct materials		$ 200,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,800

c. Availability of materials & supplies

Available on world markets if not produced locally.

3. POWER, FUEL AND WATLR

	Annual Cost
Electric Power - 30 H.P. connected load	
Fuel - For heating	
Water - Sanitation and fire protection	
	$ 1,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 8,800

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct labor		
Skilled workers	4	
Semi-skilled workers	5	
Unskilled workers	4	
Total direct labor	13	$ 63,400

c. Training needs

The manager and supervisor should be fully experienced. They, with two skilled workers should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own Transport equipment

Truck

b. External transport facilities

In and out shipments total about 4 tons per day.
Good highways necessary.
Should be on railroad, if possible.

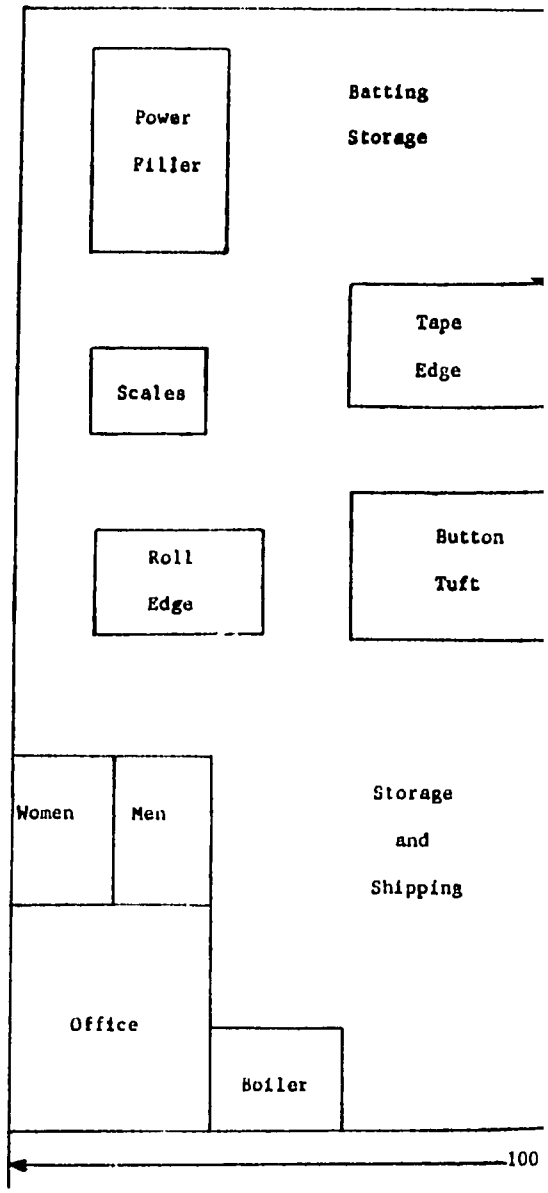
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 200,000	
Direct labor	63,400	
Manufacturing overhead*	58,600	
Total manufacturing cost		$ 322,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 30,000
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$ 400,000
Annual Gross Profit		$ 40,000
ANNUAL SALES REVENUE		$ 440,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

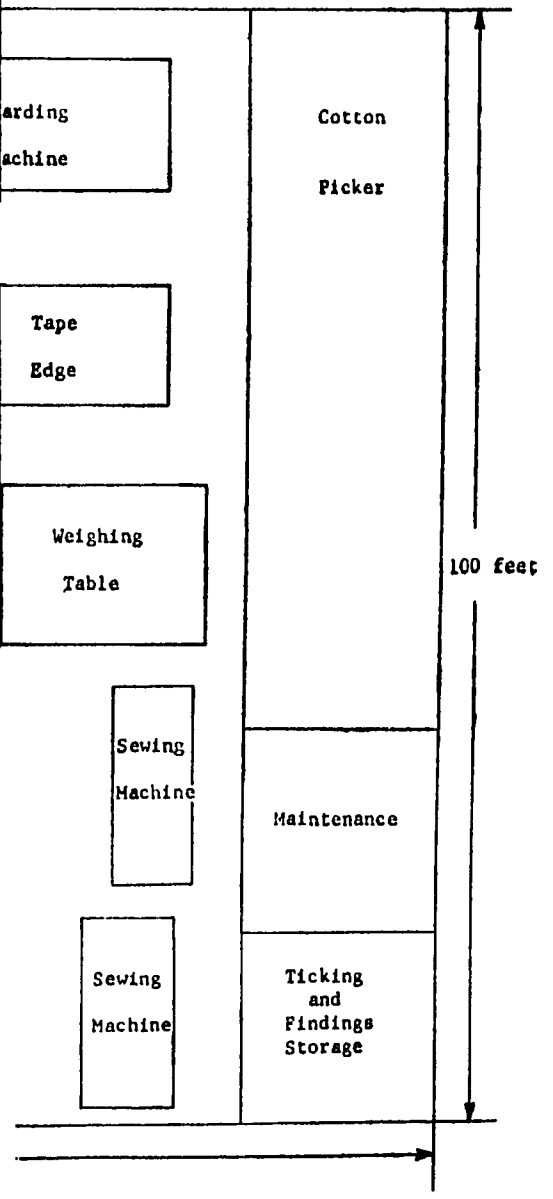
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLA


Power
Filler
Batting
Storage
Tape
Edge
Scales
Roll
Edge
Button
Tuft
Women
Men
Storage
and
Shipping
Office
Boiler
100

I. P. NO. 67254
S.I.C. 2515

UT



INNERSPRING MATTRESSES AND BOX SPRINGS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Manufacturing Processes. 5th Edition. M. L. Begeman. 1947. 612 pp. $9.95

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Discusses the engineering and economic aspects of production processes. Design routing, scheduling, conveyance, and analysis of product, treated from engineering standpoint.

B. Modern Manufacturing Processes. Joe L. Morris. 1955. 533 pp. $9.75.

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Explains present day manufacturing processes in logical sequence and at a fundamental level.

C. Plant Production Control. 3rd Edition. Charles A. Koepke. 1949. 569 pp. Illus. $ 8.95

John Wiley and Sons, Inc.
605 Third Avenue

New York, New York, 10016

An analysis of some production factors, scope and organization of production control.

II. TECHNICAL AND TRADE PERIODICALS

A. Bedding. Monthly. $ 4.00/year U. S. and Canada. $ 6.00/year all other areas.

National Association of Bedding manufacturers
724 - 9th Street, N. W.
Washington, D. C. 20001

News and information on bedding manufacture.

B. Furniture Design and Manufacturing. Monthly. Controlled free distribution.

Graphic Arts Publishing Company
7373 North Lincoln Avenue
Chicago, Illinois 60646

News and information on furniture industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $ 1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,256,535. June 21, 1966. 3 p.
Innerspring mattress construction.

B. Patent No. 3,126,554. March 31, 1964. 4 p.
Box spring mattresses and the like.

C. Patent No. 3,080,578. March 12, 1963. 5 p.
Innerspring mattress construction.

D. Patent No. 2,979,739. April 18, 1961. 4 p.
Innerspring mattress construction.

E. Patent No. 2,945,244. 1960. 7 p.
Box spring mattress construction.

F. Patent No. 2,662,235. 1953. 4 p.
Innerspring mattress and handle therefor.

G. Patent No. 2,617,143. 1952. 3 p.
Box spring mattress and handle therefor.

H. Patent No. 2,274,027. 1942. 3 p.
Innerspring mattress.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Bedding Manufacturers
724 - 9th Street, N. W.
Washington, D. C. 20001

VI. DIRECTORIES

A. Buyers Guide and Composite Catalog. Annual. $3.00.

National Association of Bedding Manufacturers
724 - 9th Street, N. W.
Washington, D. C. 20001

Complete directory of the entire bedding manufacturing industry including suppliers.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advise by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

SHOCK ABSORBERS, AUTOMOBILE AND TRUCK

I. P. No. 67255
S. I. C. 3714

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. NO. 67255
S.I.C. 3714
DECEMBER 1967

SHOCK ABSORBERS, AUTOMOBILE AND TRUCK

PRODUCT DESCRIPTION

Hydraulic type, using hydraulic fluid; made in various sizes depending upon the size and weight of the car or truck.

A. GENERAL EVALUATION OF PROSPECTS

The fixed investment for this industry is relatively small and a good return on the investment is indicated. If a sales volume of 50,000 units is possible, this industry should prove a sound investment. A comprehensive survey should be made before entering into this venture.

B. MARKET ASPECTS

1. USERS

Used only on automobiles and trucks.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are usually made through distributors in cities and through automotive parts stores and garages in small communities. The market for these products will not depend upon population of the country nor upon the per capita income. It will depend entirely on the number of automobiles and trucks that are operating within the country and the possibilities of exporting part of the plant's production to friendly bordering nations. Nationwide domestic distribution is possible and, unless other plants exist in the country, no domestic competition would be encountered. This product cannot be produced profitably on a small-scale basis. But this plant, at the indicated production volume, could not hope to compete in foreign markets against the large producers and exporters.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 220,000.
The total fixed investment, plus working capital, is estimated at $ 119,400.
The annual gross profit, before taxes, is estimated at $ 27,500.
Using these figures, the profit on gross sales, before taxes, amounts to about 12.5%.
(A gross profit on sales, before taxes, of 12.5%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 23%.

5. COST PER MAN EMPLOYED

Ten direct and five indirect workers, or a total of fifteen workers, are employed.
The total fixed capital investment is estimated at $ 83,000.
Based on these figures, the fixed investment per man employed would amount to about $5,525.

C. PRODUCTION REQUIREMENTS SHOCK ABSORBERS, AUTOMOBILE AND TRUCK

I. P. No. 67255
S. I. C. 3714

PRODUCTION CAPACITY 200 UNITS PER 8-HOUR DAY OR 50,000 UNITS ANNUALLY

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. FIXED CAPITAL

	Cost
Land - 1 acre	
Building - one story 50' x 100' Use any suitable local material.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 83,000

Principal Items:

Abrasive Tubing Cutter (Automatic), Punch Press OBI-150 ton, Chucking Machine, Cutoff and Threading Machine, Vertical Honing Machine, Hand Milling Machine, Drill Press, Welding Equipment

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 36,400

c. Total Capital Requirements $ 119,400

2 MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Tubing	115,000 ft.	
Steel rod	6 tons	
Bar steel	4 tons	
Sheet steel	3 tons	
Rubber bushings	100,000	
Springs, nuts and washers		
Packaging materials		
Total direct materials		$ 52,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 13,300

c. Availability of materials & supplies

All available in world market.

3. POWER, FUEL AND WATER

	Annual Cost
a. Electric Power. 70 H. P. connected load Fuel - Building heat and hot water Water - Production, sanitation and fire protection	$ 2,200

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,300

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Supervisor	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct Labor		
Skilled workers	3	
Semi-skilled worker	4	
Unskilled workers	3	
Total direct labor	10	$ 48,800

c. Training needs

The manager and skilled workers must be fully experienced. They should reach full production in less than thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Products well packaged.
Good highways essential.
Plant should be located on railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

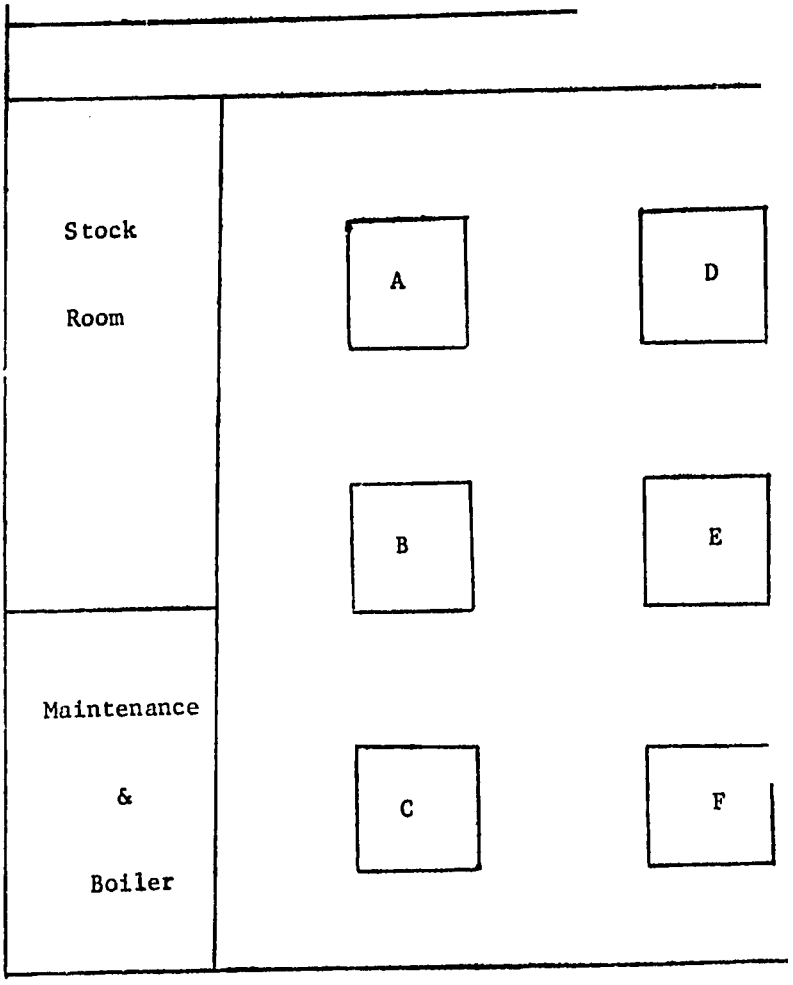
Direct materials	$ 52,000	
Direct labor	48,800	
Manufacturing overhead*	59,800	
Total manufacturing cost		$160,600
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 12,900
Sales expense		$ 10,000
Freight-out, travel discounts Allowances & bad debts		$ 9,000
Total annual costs		$192,500
Annual Gross Profit		$ 27,500
ANNUAL SALES REVENUE		$220,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT

SHOCK A



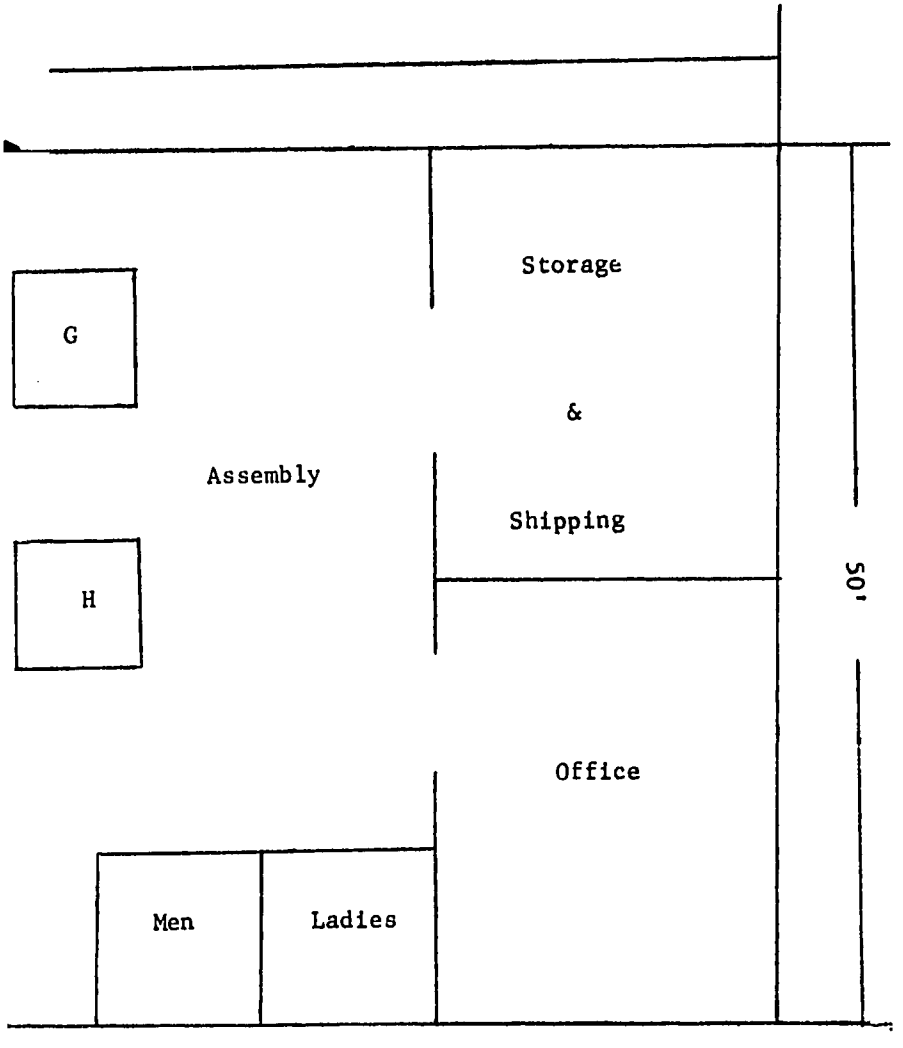
A - Abrasive - Tubing -
B - Punch Press
C - Chucking Machine
D - Cut Off and Thread

BILE AND TRUCK

I. P. NO. 67255
S I.C. 3714

PUT

BERS



E - Vertical Honing
F - Hand Milling
G - Drill Press
H - Welding

SHOCK ABSORBERS, AUTOMOBILE AND TRUCK

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Machining Principles and Cost Control. Bob Brierly and H. J. Deikmann. 1964. 254 pp. 218 Illus. $ 11.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Down to earth treatment of the fundamentals of machining. Supplies a special slide rule for cost control.

B. Machine Shop Theory and Practice. 1961. Illus. $ 1.75

St. Martin's Press, Inc.
175 Fifth Avenue
New York, New York 10010

No technical or trade books available dealing exclusively with the subject of shock absorbers.

II. TECHNICAL AND TRADE PERIODICALS

A. Mechanical Engineering. Monthly. $ 7.00/year

American Society of Mehanical Engineers
345 East 47th Street
New York, New York 10017

Has sections on metals and production engineering; also articles on the most recent developments in metals processing.

B. Automotive World. Monthly. Controlled Free Distribution.

Johnston International Publishing Corporation
386 Park Avenue, South
New York, New York 10016

International news of auto work and repairs.

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Insights and clues concerning the entire process of small business formation, growth and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,232,390. February 1966. 4 p.
Shock absorber including spring loaded valve in piston.

B. Patent No. 3,216,535. November 1965. 4 p.
Direct acting hydraulic shock absorber.

C. Patent No. 3,213,972. October 1956. 4 p.
Hydraulic, double direct acting shock absorbers.

D. Patent No. 3,207,270. September 1956. 5 p.
Hydraulic shock absorber having metering orifice means.

E. Patent No. 3,190,400. June 1965. 3 p.
Direct acting hydraulic shock absorber and air cooled bearing equipment.

F. Patent No. 3,187,847. May 1965. 4 p.
Double acting hydraulic shock absorber.

G. Patent No. 3,184,011. May 1956. 6 p.
Hydraulic direct acting shock absorber

H. Patent No. 3,154,177. October 1964. 4 p.
Hydraulic plunge type shock absorber.

I. Patent No. 3,154,177. October 1964. 4 p.
Telescopic hydraulic shock obsorber having spring biased jounce and reformed valve.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

No trade association or technical institute could be found that is devoted exclusively to shock absorbers.

VI. DIRECTORIES

A. Ward's Automotive Yearbook. Annual. $ 10.00

Powers and Company
550 West Fort Street
Detroit, Michigan 48226

Free to subscribers to Ward's Automotive Reports. Lists 600 automotive equipment and accessory companies and executives.

VII. PROFESSIONAL ENGINEERING SERVICES

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

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INDUSTRIAL HAND TRUCKS AND SKIDS

I P. No. 67256
S. I. C. 3537

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INDUSTRIAL HAND TRUCKS AND SKIDS

I. P. NO. 67256
S.I.C. 3537
DECEMBER 1967

PRODUCT DESCRIPTION

Hand trucks are flat bed trucks with two side wheels, two end wheels and four posts. Skids are flat bed skids that are moved with either a hydraulic lift truck or a fork lift truck.

A. GENERAL EVALUATION OF PROSPECTS

This plant can make other kinds of industrial trucks such as box trucks, large flat trucks for lumber, rack trucks, etc. Such items as shelving, wall racks and other wooden parts for industry could be made. The prospects for this industry will depend on the industrial activities within the country. Some industries use very few trucks while other industries use a large number of trucks and/or skids. Some warehouses and freight depots use many trucks and skids. In the average industrial plant or warehouse, trucks and skids normally last for a long period of years before they must be replaced. Therefore, unless there are a large number of existing plants to be served, there would have to be an expansion of existing industries or new industries to support the production of this plant.

B. MARKET ASPECTS

1. USERS

Industrial plants would be the principal customers. Others would use hand trucks but usually not for the skids. These include stores, warehouses, depots, wholesale establishments.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to industrial plants and any other large users. Sales would also be made to supply houses for resale to stores, warehouses, depots etc., that may need only a few at a time. The market for these items cannot be measured in terms of population but on the country's present industrial capacity and future expansion possibilities. This industry can be operated on a very small basis and with small capital investment. Skids can be made with a minimum of material and equipment. If castings can be purchased locally in small lots, the hand trucks can also be manufactured in a small plant. If such small plants already exist, competition from domestic producers can be keen but these are not export products so no competition should come from imported items.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $500,000.
The total fixed investment, plus working capital, is estimated at $158,300.
The annual gross profit, before taxes, is estimated at $48,000.
Using these figures, the profit on gross sales, before taxes, amounts to 9.6%.
(A gross profit on sales, before taxes, of 9.6% while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 30.4%.

5. COST PER MAN EMPLOYED

Twelve direct and six indirect workers, or a total of eighteen workers, are employed.
The total fixed capital investment is estimated at $ 77,000.
Based on these figures, the fixed investment per man employed would amount to about $4,300.

C. PRODUCTION REQUIREMENTS INDUSTRIAL HAND TRUCKS AND SKIDS — I.P. No. 67256 S.I.C. 3537

ANNUAL CAPACITY - ONE SHIFT OPERATION: 12,500 HAND TRUCKS AND 12,500 FACTORY SKIDS

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land. 1 acre.	
Building. 80'x50' or 4,000 sq. ft.	
Local materials may be used.	
Equipments, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 77,000

Principal items:
Cutoff Saw
Trim Saw
Ripsaw
Jointer
Planer
Sticker
Boring Machine
Spray Booth

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 81,300
c. Total Capital Requirements	$ 158,300

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Lumber - board feet	1,625,000	
Hardware		
Castings		
Shellac and lacquer		
Total direct materials		$ 280,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,200

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 50 H. P. connected load	
Fuel - Scrap wood used	
Water - Sanitation and fire protection	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,300

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Supervisor	1	
Office	2	
Manitenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	4	
Unskilled workers	6	
Total direct labor	12	$ 53,600

c. Training needs

The manager must be fully experienced. He, and two skilled workers, should be able to train other workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Product is bulky and heavy.
Good highways essential.
Access to railroad, if possible.

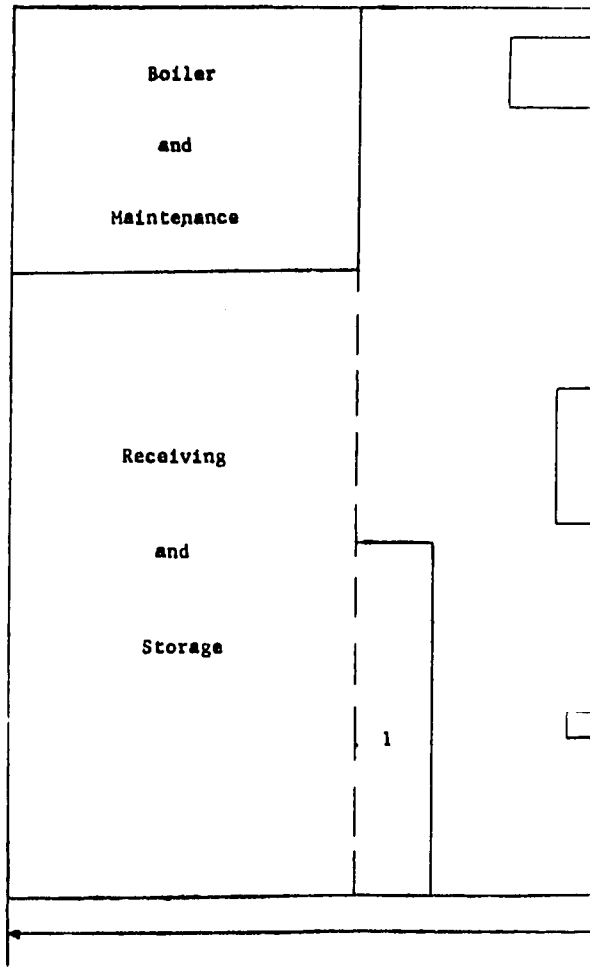
7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 280,000	
Direct labor	53,600	
Manufacturing overhead*	57,800	
Total manufacturing cost		$ 391,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 26,600
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 10,000
Total annual costs		$ 452,000
Annual Gross Profit		$ 48,000
ANNUAL SALES REVENUE		$ 500,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

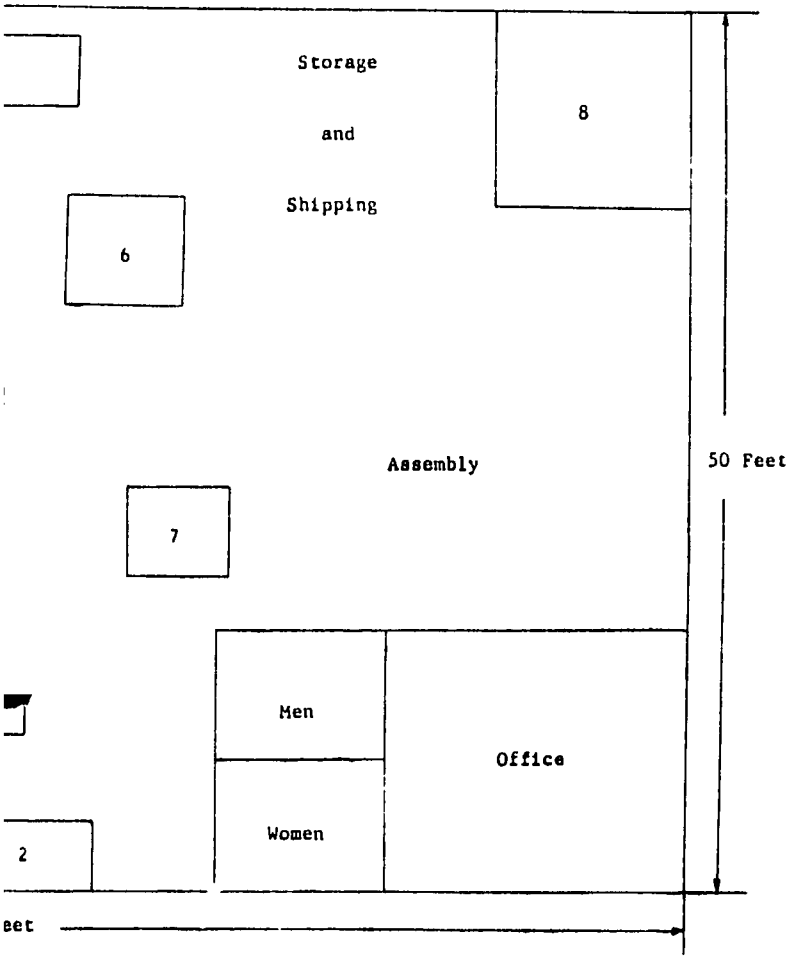
1 Cutoff Saw
2 Ripsaw
3 Jointer
4 Planer
5 Sticker
6 Trim Saw
7 Boring
8 Spray Booth



UCKS AND SKIDS

I. P. NO. 67256
S. I. C. 3537

YOUT



INDUSTRIAL HAND TRUCKS AND SKIDS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. General Woodworking. 3rd Edition. C. H. Groneman. 1965. 256 pp. Illus. $7.25

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Machine tool processes, hand tool processes, portable tool processes, and related woodworking information.

B. Carpentry Book. Charles H. Hayward. 1955. Illus. $5.95.

D. Van Nostrand & Company
120 Alexander Street
Princeton, New Jersey 08540

II. TECHNICAL AND TRADE PERIODICALS

A. Wood Working Digest. Monthly. $5.00/year.

Hitchcock Publishing Company
Wheaton, Illinois 60188
Covers the major branches of the wood working industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Sperintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

D. Starting and Managing a Small Business of Your Own. Wendell O. Metcalf. 49 pp. 1962. $.25. Vol. I (2nd Edition) of the Starting and Managing Series of the Small Business Administration, Washington, D. C.

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Pitfalls usually encountered when entering a new business. Sources of additional information given.

IV. REPRESENTATIVE U.S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,137,250 June 16, 1964. 7 p.
Material handling device.

B. Patent No, 3,179,270. April 20, 1965. 4 p.
Apparatus for use in supporting and transporting a plurality of articles.

C. Patent No. 3,104,890. Sepember 24, 1963 6 p.
Utility cart having telescopic tubular frame members.

D. Patent No. 3,064,989. November 20, 1962 3 p.
Convertible dolly type vehicle.

E. Patent No. 2,984, 499. May, 16, 1961 5 p.
Cart selectively adaptable to multiple uses.

F. Patent No. 2,869,886. 1959. 4 p.
Hand truck for stacked articles.

G. Patent No. 2,738,983. 1956. 5 p.
Hand truck for moving heavy articles.

H. Patent No. 2,662,777. 1953. 3 p.
Two-wheeled hand cart.

I. Patent No. 2,605,117. 1952. 5 p.
Warehouse and factory hand truck.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Wooden Pallet Manufacturers Association
1619 Massachusetts Avenue, N. W.
Washington, D. C. 20036

B. Industrial Truck Association
250 Gateway Towers
Pittsburgh, Pennsylvania 15222

VI. DIRECTORIES

A. Materials Handling Handbook. Annual. $2.00

Maclean Hunter Publishing Co.
481 University Avenue
Toronto 2, Canada

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

STANDARD SPORTS STOCKINGS

I. P. No. 67257
S. I. C. 2252

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67257
S.I.C. 2252
DECEMBER 1967

STANDARD SPORTS STOCKINGS

PRODUCT DESCRIPTION

Cotton stockings, knitted without feet, for baseball and soccer players. The average weight per pair is 4 1/4 ounces.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend largely on the sports activities within the country. Stockings of this kind are worn only by people who play baseball, soccer or similar games. The capital requirements for this plant are moderate in comparison with the sales volume and estimated profits. If adequate sales for this product are apparent, this industry should represent a satisfactory investment.

B. MARKET ASPECTS

1. USERS

Used only by amateur and professional baseball, soccer or similar sports players.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to retail stores, department stores and sporting goods stores. In some cases sales might be made to wholesalers. A comprehensive survey should be made to determine the sales potential. This product is light and well packaged. The potential market should be nationwide if sufficient transportation facilities exist. The plant should be able to compete with imported products provided the potential sales are sufficient for continuous operation. A plant of this capacity could not compete with large, mass production plants in worldwide markets but could export to neighboring counties if the same product is not already manufactured there.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrials products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $280,000.
The total fixed investment, plus working capital, is estimated at $147,100.
The annual gross profit before taxes, is estimated at $ 26,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.3%.
(A gross profit on sales, before taxes, of 9.3%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 17.6%.

5. COST PER MAN EMPLOYED

Twelve direct and six indirect workers, or a total of eighteen workers, are employed.
The total fixed capital investment is estimated at $ 100,000.
Based on these figures, the fixed investment per man employed would amount to about $5,550.

C. PRODUCTION REQUIREMENTS STANDARD SPORT STOCKINGS I. P. No, 67257
ANNUAL CAPACITY - ONE SHIFT OPERATION: 30,000 DOZEN PAIRS S.I.C. 2252
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. FIXED CAPITAL

	Cost
Land - 10,000 square feet of level, well drained land.	
Building - one story, 30' x 128' Local materials may be used,	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$100,000

Principal Items :

20 Knitting Machines with Elastic Top Attachments and 20 Packing Charges, Motor and Transmissions, 2 Loopers and Motor, 25-pound Capacity Rotary Die Vat and Motor, 30-inch Extractor and Motor, Turning Board, Boarding Table, 2 Sewing Machines, Racks, Tables, Baskets, Work Bench, Small Tools, Truck, Chairs

b. Working Capital (30 days)

Direct Materials	
Direct Labor	
Manufacturing Overhead	
Administrative Costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 47,100

c. Total Capital Requirements $147,100

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Cotton yarn	In quantities and weights as needed	
Chemicals, dyes		
Cartons		
Boxes		
Total direct materials		$ 85,700

b. Supplies

Lubricants & hand tools	
Gas, oil and maintenance of truck	
Maintenance & spare parts	
Office supplies	
Total supplies	$ 2,800

c. Availability of materials & supplies

The chemicals, dyes, and needles may have to imported. Other materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
a. Electric Power - about 30 H. P. connected load	
b. Fuel - For production and heating.	
c. Water - For production sanitation and fire protection.	$ 1,150

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,350

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Office	2	
Maintenance	1	
Clerk	1	
Truck Driver	1	
Total indirect labor	6	$ 40,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	9	
Unskilled workers	2	
Total direct labor	12	$ 58,200

c. Training needs

The manager should be fully experienced. He and one skilled worker should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

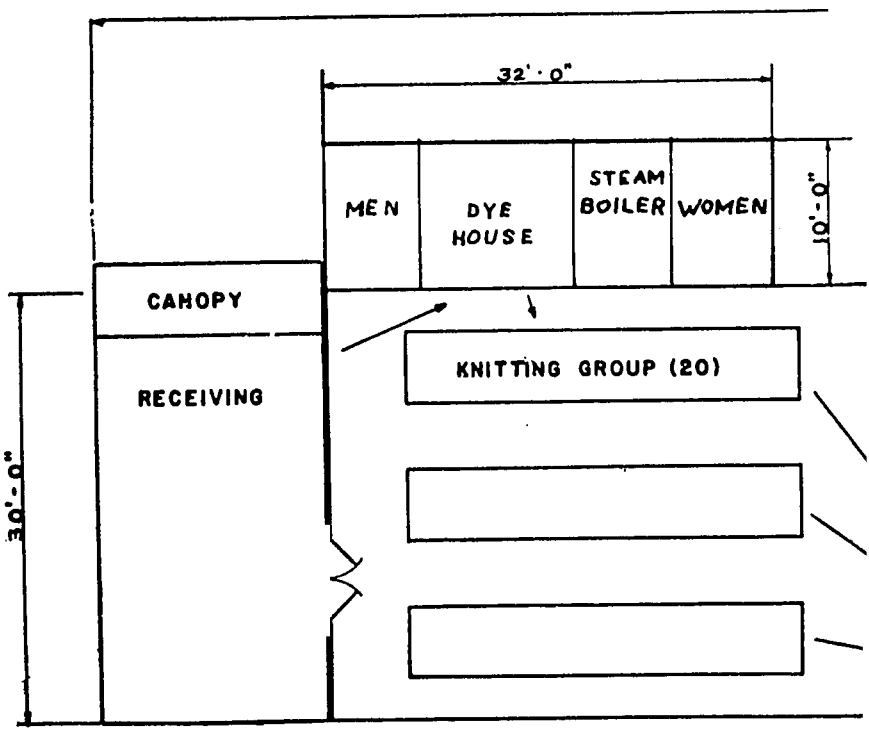
In and out shipments amount to less than one ton per day.
Good highways should be available.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 85,700	
Direct labor	58,200	
Manufacturing Overhead*	53,300	
Total manufacturing cost		$ 197,200
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 22,300
Sales expense		$ 22,000
Freight-out, travel discounts Allowance & bad debts		$ 12,500
Total Annual costs		$ 254,000
Annual Gross Profit		$ 26,000
ANNUAL SALES REVENUE		$ 280,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

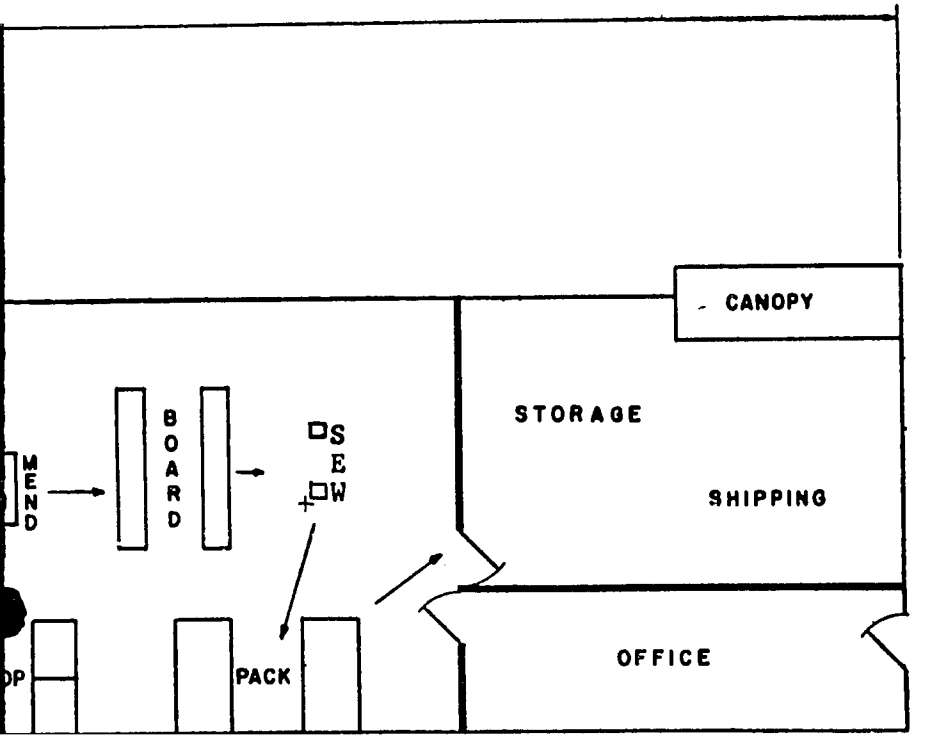
PLANT LA


32'-0"
MEN
DYE HOUSE
STEAM BOILER
WOMEN
10'-0"
CANOPY
RECEIVING
KNITTING GROUP (20)
30'-0"

STOCKINGS

I. P. NO. 67257
S. I. C. 2252

WORKFLOW



I.P. No. 67257
S.I.C. 2252

STANDARD SPORTS STOCKINGS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Principles of Knitting. Volume I, General. Volume II, Circular. W. E. Shinn. $ 5.00 each volume.

Textile Book Service
257 Fourth Avenue
New York, New York 10010

Volume II covers the knitting of socks.

B. Warp Knitting Technology. D. F. Paling. $3.25

Textile Book Service
257 Park Avenue, South
New York, New York 10010

Technology of machine warp knitting.

II. TECHNICAL AND TRADE PERIODICALS

A. Textile World. Monthly. $2.00/year.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Devoted to the textile industry.

B. Textile Industries. Monthly. $2.00/year.

W.R.C. Smith Publishers
806 Peachtree Street, N. E.
Atlanta, Georgia 30309

Devoted to the textile industry.

C. Apparel Manufacturer. Monthly. $5.00/year.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
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Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.25 each

A.	Patent No. 3,217,336 Knitted footwear.	November 17, 1965	6 p.
B.	Patent No. 3,196,640 Hosiery.	July 27, 1965	4 p.
C.	Patent No. 3,146,468 Sock construction.	September 1, 1964	3 p.
D.	Patent No. 3,142,974 Method of knitting hosiery.	August 4, 1964	8 p.
E.	Patent No. 3,132,497 Knitted elastic footwear.	May 12, 1964	9 p.
F.	Patent No. 3,090,963 Circular knit hosiery.	May 28, 1963	6 p.
G.	Patent No. 3,015,942 Circular knit hosiery.	January 9, 1962	3 p.
H.	Patent No. 2,987,898 Circular stocking making machine of the axially opposed double cylinder type.	1961	10 p.
I.	Patent No. 2,980,917 Circular knit hosiery.	April 25, 1961	6 p.
J.	Patent No. 2,979,927 Knitting machine for circular articles including men's socks.	1960	10 p.
K.	Patent No. 2,959,040 Sock making machine of the superimposed needle cylinder type.	1960	15 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Apparel Manufacturers Association
2000 "K" Street, N. W.
Washington, D. C. 20006

B. Textile Research Institute
Box 625
Princeton, New Jersey 08540

VI. DIRECTORIES

A. American Apparel Manufacturers Association Directory of Members. Annual. $15.00

American Apparel Manufacturers Association
2000 "K" Street, N. W.
Washington, D. C. 20006

Lists 500 members and associate members, personnel, purchasing agents, suppliers to the apparel manufacturing trade.

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GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

BOOKCASES, CORNER CABINETS AND SECRETARIES

I. P. No. 67258
S. I. C. 2511

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67258
S. I. C. 2511
DECEMBER 1967

BOOKCASES, CORNER CABINETS AND SECRETARIES

PRODUCT DESCRIPTION

(1) The bookcases are 80" high and have glass in the doors. (2) The corner cabinets are designed to fit into the corner of a room. They are 80" high and have glass in the doors. (3) The secretaries are 80" high with a writing desk that closes. Each one has a bookcase over the desk and drawers below the desk.

A. GENERAL EVALUATION OF PROSPECTS

The total capital requirements are fairly moderate in comparison with the estimated sales volume and profits. The prospects for this industry will depend to a great extent upon the per capita income and the kind of furniture generally used by upper income level families. In many countries, these products may not be used extensively except in urban areas. The availability of a local supply of suitable lumber is also an important factor. A comprehensive survey should be conducted relative to the availability of a potential sales volume and sources of raw materials to determine whether a profitable investment can be made.

B. MARKET ASPECTS

1. USERS

These products would be used principally in homes, hotels and clubs.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to retail furniture stores and department stores. These products are well packaged and the selling price would permit nationwide shipment and distribution. But in many countries the bulk of the sales would be made in urban areas to higher-income level customers. This industry cannot operate successfully on a small volume basis. Unless other plants of the same type are already in existance in the country, no domestic competition should be encountered. A plant of this capacity would not be able to compete in world markets. Usually special designs are needed for successful export sales. If raw materials are available locally and if the plant is well-run, this industry should be able to meet competition from similar imported products successfully.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United State of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have, widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $400,000.
The total fixed investment, plus working capital, is estimated at $186,900.
The annual gross profit, before taxes, is estimated at $28,000.
Using these figures, the profit on gross sales, before taxes, amounts to 7%.
(A gross profit on sales, before taxes, of 7% while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 15%.

5. COST PER MAN EMPLOYED

Twelve direct and six indirect workers, or a total of eighteen workers, are employed.
The total fixed capital investment is estimated at $120,000.
Based on these figures, the fixed investment per man employed would amount to about $6,670.

C. PRODUCTION REQUIREMENTS BOOKCASES, CORNER CABINETS AND SECRETARIES — I.P. No. 67258 S.I.C. 2511

ANNUAL CAPACITY - ONE SHIFT OPERATION : 6,000 BOOKCASES, 6,000 CORNER CABINETS, 6,000 SECRETARIES

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 2 acres	
Building - one story 80'x100' Dry kiln. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 120,000

Principal items:

Cutoff Saw, Jointer, Ripsaw, Planer, Two Trim Saws, Glue Jointer, Glue Reel, Shaper, Two Boring Machines, Three-drum Sander, Table Sander, Assembly Presses, Glue Pots, Spray Booth, Compressor

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 66,900
c. Total Capital Requirements	$ 186,900

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Lumber	1,580,000 board feet	
Glass	100,000 square feet	
Lacquer		
Hardware		
Packaging		
Total direct materials		$ 190,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,600

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Costs
Electric Power - 70 H. P. connected load	
Fuel - Scrap wood is used	
Water - Production, sanitation and fire protection	$ 2,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,900

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Supervisor	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct Labor		
Skilled workers	4	
Semi-skilled workers	4	
Unskilled workers	4	
Total direct labor	12	$ 58,400

c. Training needs

The manager and supervisor must be fully experienced. They, with 3 skilled workers, should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

These products are well packaged.
Good highways are essential.
Plant should be on a railroad if possible.

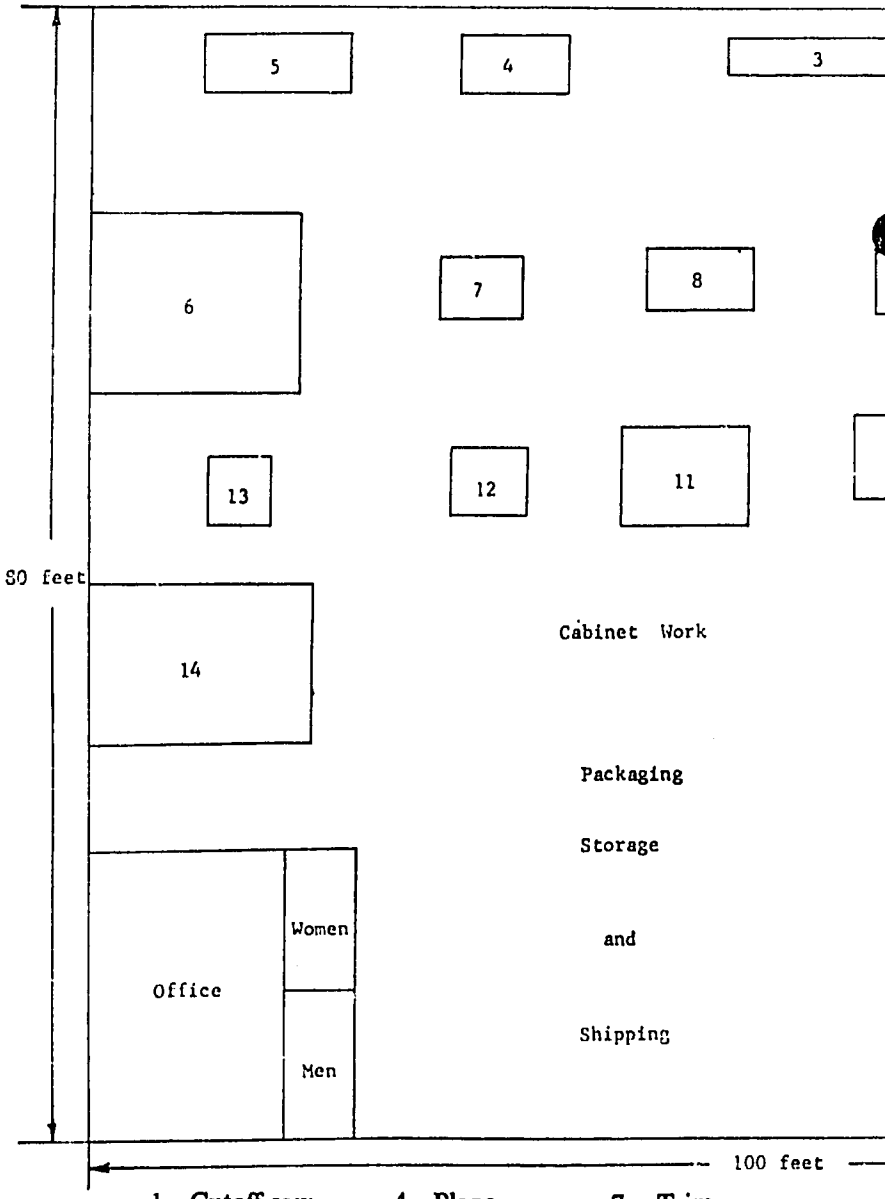
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct Materials	$ 190,000	
Direct labor	58,400	
Manufacturing overhead*	62,200	
Total manufacturing cost		$ 310,600
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 31,400
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 6,000
Total annual costs		$ 372,000
Annual Gross Profit		$ 28,000
ANNUAL SALES REVENUE		$ 400,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

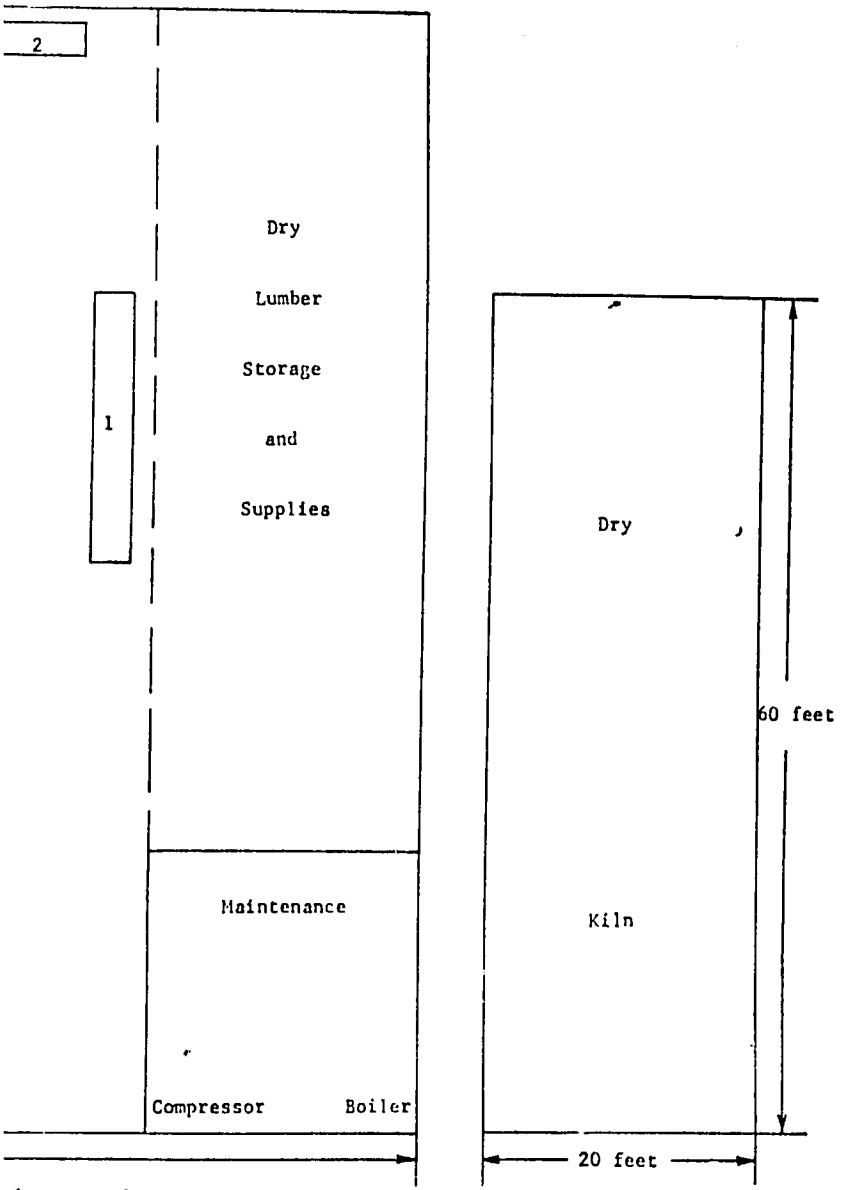
PLANT LAYO



1 Cutoff saw
2 Jointer
3 Ripsaw
4 Planer
5 Glue jointer
6 Glue Reel
7. Trim saw
8. Shaper
9. Boring machine

I.P. NO. 67258
S.I.C. 2511

WORKFLOW



ee-drum sander
le sander
m Saw
13 Boring machine
14 Spray booth

I. P. NO. 67258
S. I. C. 2511

BOOKCASES, CORNER CABINETS AND SECRETARIES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener 1966. 474 pp. 1550 Illus. $6.96

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equipment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp. 275 Illus. 2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete information on basic woodworking from raw materials through finished product.

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $ 5.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joint, workshop practice, drawers, bookcases, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.
Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188

Devoted to coverage of industrial woodworking.

B, Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes, marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,243,245 March 1966 7 p.
Frame structure and joining of members.

B. Patent No. 3,219,400 November 1965 3 p.
Improvement in bookcase structure.

C. Patent No, 3,125, 387 March 1964 16 p.
Conference tables, bookcases and credenzas.

D. Patent No, 2,768,045 1956 3. p.
Corner cabinet.

E. Patent No. 2,520,566 1950 8 p.
Corner cabinet.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Furniture Manufacturers
666 Lake Shore Drive
Chicago, Illinois 60611

B. Furniture Manufacturers Association
103 Pearl Street, N. W.
Grand Rapids, Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers and suppliers for the woodworking industries.

/II. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one of which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

POULTRY FARM (EGG PRODUCTION)

I. P. No. 67259
S. I. C. 0133

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I. P. NO. 67259
S.I.C. 0133
DECEMBER 1967

POULTRY FARM (EGG PRODUCTION)

PRODUCT DESCRIPTION

Poultry farm devoted to the production of eggs. Hens are sold for meat only after they have passed their peak of egg production.

A. GENERAL EVALUATION OF PROSPECTS

There are so many large poultry farms in the United States that a farm of the capacity described in this profile could not be operated in the U.S. at a profit. There are almost no small poultry farms operating in the United States at present and virtually none as small as the farm described here. Many countries endeavoring to develop industry have done very little about the poultry industry. There is a definite need for breed improvement and greater egg production in countries where the hens and eggs are small. While this profile is intended for use in countries other than the United States, the cost of buildings, equipment, materials and labor are based on average costs in the U.S. at the present time. The sales values given in this profile are higher than those presently prevailing in the U.S. because U.S. egg prices today are lower than they have been in many years. A plant of the size indicated in this profile would be a profitable investment in many countries and would be a means of upgrading the existing poultry stock. When the laying hens have passed their production peak, they are sold. Funds received from the sale of hens will provide feed for the new chicks until they reach laying age. For culling purposes, 10% extra, or 1,100 chicks, are purchased to provide 1,000 good laying hens.

B. MARKET ASPECTS

1. USERS

Bakeries, restaurants, private homes for food consumption.

2. SALES CHANNELLS AND EXTENT OF MARKET

Sales are made direct to consumers. The domestic market should comprise a radius of 15 miles. The size and quality of eggs produced should eliminate domestic competition. This plant will produce about 700 eggs per day and a relatively small population, close to the poultry farm, should consume the plant's entire output. This farm is too small to consider exporting any part of the plant's production. No competition from imported products should be experienced.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United State of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit magings such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 14,000.
The total fixed investment, plus working capital, is estimated at $ 17,100.
The annual gross profit, before taxes, is estimated at $ 1,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.1%.
(A gross profit on sales, before taxes, of 7.1%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 5.8%.

5. COST PER MAN EMPLOYED

One direct and one indirect worker, or a total of two workers, are employed.
The total fixed capital investment is estimated at $ 14,800.
Based on these figures, the fixed investment per man employed would amount to $ 7,400.

C. PRODUCTION REQUIREMENTS - POULTRY FARM (EGG PRODUCTION) S.I.C. 0133

ANNUAL CAPACITY - 1,000 LAYERS: 22,000 DOZEN EGGS

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - one acre	
Building - 40' x 60'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 14,800

Principal items:

14 High stand feeders 8' long
4 Automatic water units 8' long
4 Grit and oyster shell boxes
20 10-hole metal nests
1 Time clock
2 Egg baskets
1 Egg inspection equipment

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 2,300
c. Total Capital Requirements	$ 17,100

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Chicks	1,100	
Feed	40 tons	
Grit and oyster shells		
Chemicals, medicinals and insecticides		
Egg cartons		
Total direct materials		$ 4,900
b. Supplies		
Lubricants & hand tools		
Cutting tools & abrasives		
Maintenance & spare parts		
Office supplies		
Gas, oil and maintenance of truck		
Total supplies		$ 500

c. Availability of materials & supplies

All available locally except chicks.

3. POWER, FUEL AND WATER

Electric Power - lights	Annual Cost
Fuel - none required	
Water - must be potable	
	$ 290

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 1,410

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Owner	1	
Total indirect labor	1	$ 4,000
b. Direct labor		
Skilled workers	0	
Semi-skilled workers	0	
Unskilled workers (part-time)	1	
Total direct labor	1	$ 400

c. Training needs

Owner will train the part-time worker to assist in cleaning the building. Owner will drive the delivery truck or will train part-time worker.

6. TRANSPORTATION

a. Own transport equipment

Truck.

b. External transport facilities

None required.
Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

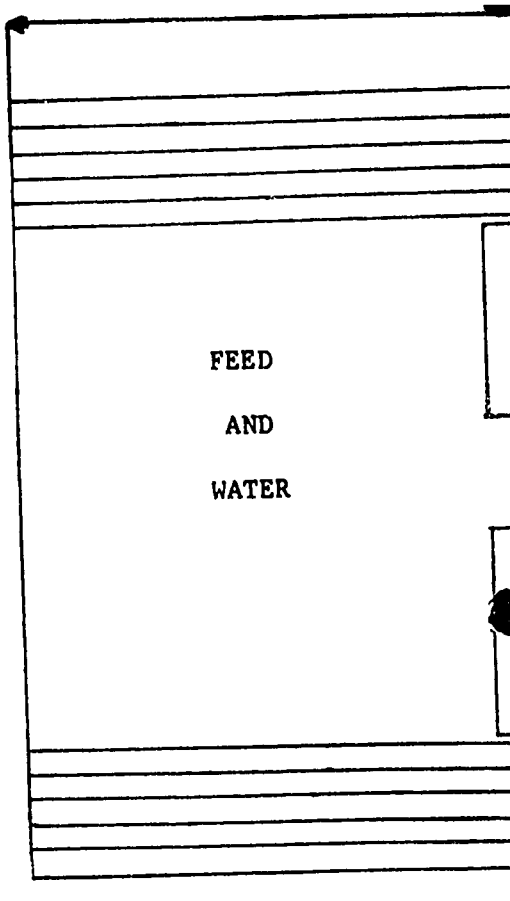
Direct materials	$ 4,900	
Direct labor	400	
Manufacturing overhead*	6,200	
Total manufacturing cost		$ 11,500
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		1,100
Sales expense		0
Freight-out, travel discounts Allowances & bad debts		400
Total annual costs		$ 13,000
Annual Gross Profit		$ 1,000
ANNUAL SALES REVENUE		$ 14,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

POULTRY F

P L



EGG INSPECTION AND PAC

GG PRODUCTION)

I. P. NO. 67259
S. I. C. 0133

LAYOUT

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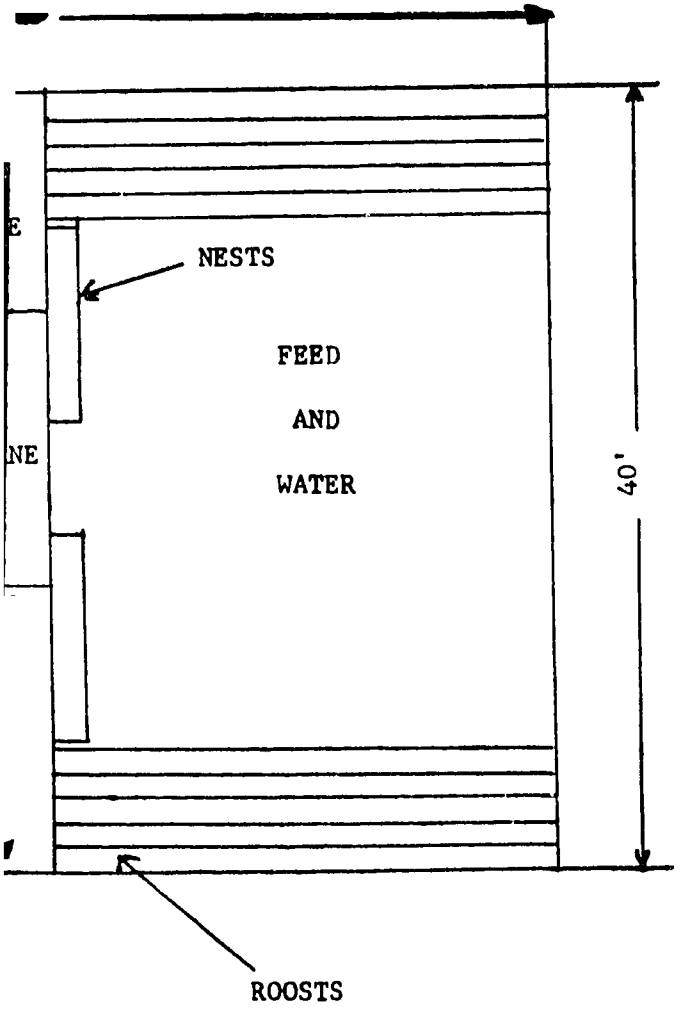

I. P. NO. 67259
S.I.C. 0133

POULTRY FARM (EGG PRODUCTION)

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Marketing Poultry Products. E. W. Benjamin and others. 5th Edition. 1960. 327 p.p. Illus. $7.95

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

B. Poultry Production. C. E. Bundy and R. V. Diggins. 1960. 370 pp. $8.04

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Deals with the operation of poultry farming.

C. Farm Poultry Management. Sept. 1966. $.15. Farmers' Bulletin No. 2197. U.S. Department of Agriculture.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

II. TECHNICAL AND TRADE PERIODICALS

A. Everybody's Poultry Magazine. Monthly. $.50/year.

Everybody's Poultry Magazine Publishing Company
Hanover, Pennsylvania 17331

Deals exclusively with the poultry industry.

B. Poultry and Eggs. Weekly Newspaper. $2.00/year.

Packer Publishing Company
201 Delaware Street
Kansas City, Missouri 64105

Deals exclusively with the poultry industry.

III. BUSINESS MANAGEMENT MATERIALS

A. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

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Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,148,649. September 1964 6 p.
Method of treating eggs.

B. Patent No. 3,123,045. March 1964 4 p.
Vacuum process for treating hatching eggs.

C. Patent No. 3,120,834. February 1964. 4 p.
Method of introducing adjuvants into avian egg interiors.

D. Patent No. 3,123,044 March 1964. 5 p.
Apparatus for recording poultry egg production.

E. Patent No. 3,071,110. January 1963. 3 p.
Animal actuated poultry nest appliance.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Poultry and Hatchery Association
521 East 63rd Street
Kansas City, Missouri 64110

B. Poultry Breeders of America
521 East 63rd Street
Kansas City, Missouri 64110

VI. DIRECTORIES

A. Who's Who in the Egg and Poultry Industry. Annual. $15.00

Watt Publishing Company
Sandstone Building
Mount Morris, Illinois 61054

Firms manufacturing poultry equipment and supplies, egg and poultry processors, wholesalers, jobbers, brokers, exporters, Federal agencies, associations.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of a private professional engineer are not likely to be needed to establish a poultry farm since the equipment needed to operate an egg production plant can usually be obtained, on lease, from the manufacturer. Manufacturers of equipment employ specialists familiar with the design and installation of their specialized products. These manufacturers usually give prospective customers the benefit of technical advice by their engineers or specialists in determining the suitability of their equipment for the enterprise in question.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

CAST IRON SOIL PIPE

I. P. No. 67260
S. I. C. 3321

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67260
S.I.C. 3321
DECEMBER 1967

CAST IRON SOIL PIPE

PRODUCT DESCRIPTION

Cast iron soil pipe with bell and spigot ends. The pipe is in five-foot lengths of 2, 3, 4, 5 and 6-inch diameter. Other sizes in length and diamater can be produced.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry depend to a great extent on the local availability of pig iron soil pipe required within the country. The estimated capital investments are relatively low in comparison with the annual gross sales. Normally, the sale of cast iron pipe depends on the construction activities within a country. If the raw materials are available locally and the sales potential is adequate, this industry should represent a good investment.

B. MARKET ASPECTS

1. USERS

Construction contractors, industries, public works and agricultural enterprises.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales will normally be made to wholesalers for distribution to retailers and direct to large users such as construction contractors, industries and public works enterprises. Cast iron soil pipe is bulky and heavy but it does not require packaging. The pipe is not difficult to transport and the transportation costs should not be exorbitant in comparison with the selling price. The market required for this product depends on the developing of construction public works projects, industry and agriculture. A comprehensive survey should be made to determine the sales potential of cast iron soil pipe. If things look favorable, nationwide distribution should be considered. This pipe cannot be produced at a profit on a small scale. Unless other industries exist within the country, no domestic competition should be encountered. A plant of the size indicated in this profile cannot expect to compete in international market although exports of cast iron soil pipe to neighboring nations without this plant's capability can be considered.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $625,000.
The total fixed investment, plus working capital, is estimated at $386,500.
The annual gross profit, before taxes, is estimated at $ 75,000.
Using these figures, the profit on gross sales, before taxes, amounts to 12%.
(A gross profit on sales, before taxes, of 12%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 19.4%.

5. COST PER MAN EMPLOYED

Sixteen direct and eight indirect workers, or a total of twenty-four workers, are employed.
The total fixed capital investment is estimated at $284,000.
Based on these figures, the fixed investment per man employed would amount to about $11,825.

C. PRODUCTION REQUIREMENTS CAST IRON SOIL PIPE — I.P. No. 67260
ANNUAL CAPACITY - ONE SHIFT OPERATION: 2, 3, 4, 5, AND 6 INCH DIAMETER PIPE, 5 FEET LONG. 6,000 TONS — S.I.C. 3321
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 2 acres	
Building - 100' x 200'. 20,000 sq. ft.	
Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 284,000

Principal items:
Cupola, 4 Pin Lift Molding Machines, Sand Slinger, Weighing Scales, 4 Ladles, 4 Table Refractories, 4 Core Mandrils, 12 Flasks, Muller, Air Compressor, Monorail Hoist, 4 Tumbling Barrels, Hoist for Dipping, Dip Tank, Fork-Lift Truck, Wheel Barrows, Hand Lift Truck, Scrap Breaking Equipment, Holding Ladle, Shake out Barrel, Electric Welder, Platform Scales, Core Arbor, Core Ovens

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 102,500
c. Total Capital Requirements	$ 386,500

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Pig iron	1,600 tons	
Scrap iron	5,000 tons	
Coke	360 tons	
Air dry Japan for dipping		
Total direct materials		$ 294,200

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts incl. refractories	
Office supplies	
Welding rods	
Molding and core sand	
Gas, oil and maintenance for truck	
Total supplies	$ 18,000

c. Availability of materials & supplies

Pig iron and refractories may have to be imported. All other materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 100 H.P. connected lead	
Fuel - Heating	
Water - Sanitation and fire protection	$ 2,400

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 23,100

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Supervisor	1	
Office	2	
Maintenance	2	
Receiving & Shipping	1	
Truck Driver	1	
Total indirect labor	8	$ 57,000
b. Direct labor		
Skilled workers	4	
Semi-skilled workers	4	
Unskilled workers	8	
Total direct labor	16	$ 72,800

c. Training needs

The manager and supervisor should be fully experienced. They, with two skilled workers, should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments amount to about 50 tons per day.
Plant should be located on a railroad.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 294,200	
Direct labor	72,800	
Manufacturing overhead*	100,500	
Total manufacturing cost		$ 467,500
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 38,500
Sales expense		$ 32,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 550,000
Annual Gross Profit		$ 75,000
ANNUAL SALES REVENUE		$ 625,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

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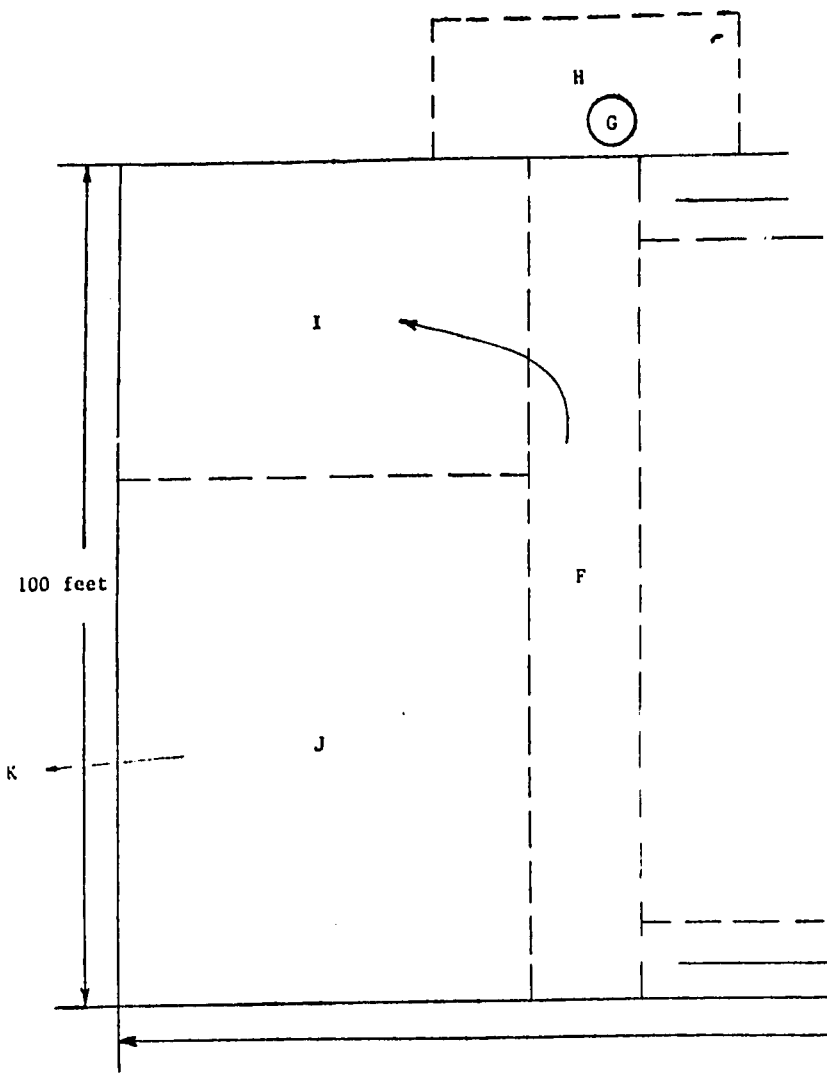


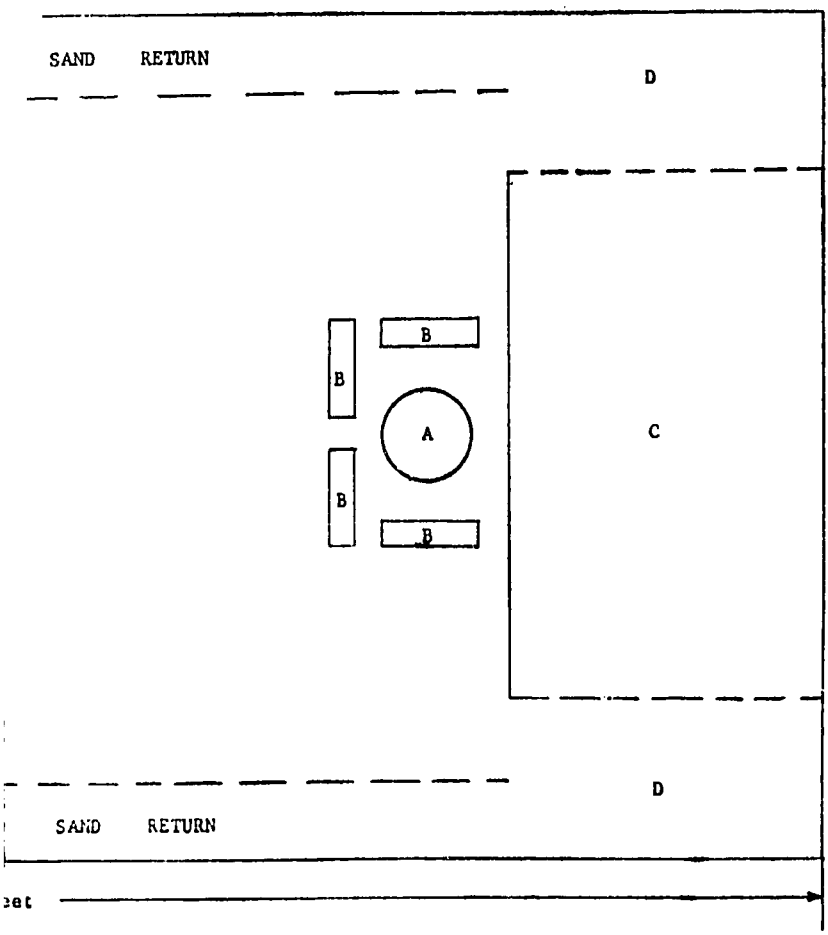
A Sand Slinger
B Pin Lift Molding Machines
C Core Making Area
D Core Drying Area
E Mold Storage Area
F Pouring and Shake Out Area

G Cupola
H Melting R
I Cleaning R
J Dipping, I
K Yard Stora
L Storage --

IL PIPE

I.P. NO. 67260
S.I.C. 3321

WORKFLOW



and Supplies

CAST IRON SOIL PIPE

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Introduction of Foundry Technology. D. C. Ekey and W. P. Winter. 1958. 296 pp. $7.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036
Devoted to foundry technology and methodology of various foundry processes.

B. Foundry Practices. S. E. Rusinoff. 1955. 261 pp. $ 6.50

American Technical Society
848 East 58th Street
Chicago, Illionis 60637

Presents practical treatment of foundry practices.

C. Principles of Metal Casting. R. W. Heine and P. C. Rosenthal. 2nd Edition. 639 pp. Illus. $ 9.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036
Patterns, molding processes, materials, molding equipment, sands and cores.

II. TECHNICAL AND TRADE PERIODICALS

A. Foundry. Monthly. $ 10.00/year

The Penton Publishing Company
Penton Building
Cleveland, Ohio 44113

Primarily for management, production, technical and purchasing personnel.

B. Modern Castings. Monthly. $ 60.0/year.

American Foundrymen's Society
Golf and Wolf Roads
Des Plaines, Illinois 60016
News of interest to foundrymen.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,239,906 Apparatus and process for manufacturing pipe	March 15, 1966	6 p.
B.	Patent No. 3,206,811 Mold and core arrangement for casting Hollow elongated bodies.	September 21, 1965	5 p.
C.	Patent No. 3,174,199 Method for centrifugal casting and apparatus for practicing it.	March 23, 1965	13 p.
D.	Patent No, 3,171,171 Mold forming and centrifugal casting apparatus.	March 2, 1965	7 p.
E.	Patent No. 3,128,765 Automatic core setters for centrifugal pipe casting machines.	February 9, 1965	6 p.
F.	Patent No. 3,077,013 Centrifugal casting of pipe.	February 12, 1963	7 p.
G.	Patent No. 3,072,980 Centrifugal casting apparatus for manufacture of pipe.	January 15, 1963	16 p.
H.	Patent No. 2,779,075 Cast article and method of making.	1957	6 p.
I.	Patent No. 2,294,170 Casting of iron.	1942	13 p.
J.	Patent No. 2,294,169 Casting of iron or steel.	1942	4 p.
K.	Patent No. 2,248,628 Method of casting metal bodies.	1941	5 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Cast Iron Soil Pipe Institute
1824-26 Jefferson Place, N. W.
Washington, D. C. 20036

VI. DIRECTORIES

A. ASHRAE Guide and Data Book. Annual. $15.00

American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
345 East 47th Street
New York, New York 10017

In addition to the annual directory, the Society also publishes a monthly journal.

VII. PROFESSIONAL ENGINEERING SERVICES.

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in the Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

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FIG AND DATE PROCESSING

I. P. No. 67261
S. I. C. 2034

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I.P. No. 67261
S.I.C. 2034

FIG AND DATE PROCESSING

PRODUCT DESCRIPTION

Figs and dates, dried and packaged.

A. GENERAL EVALUATION OF PROSPECTS

This plant is of moderate size and will operate three months out of the year during the fig and date seasons. The processing of figs and dates consists of a series of operations which includes sun drying, fumigating, cleaning, cooking sorting and packaging. Figs are processed with a hot water cleaning, or for extra fancy packs, they may be further cooked in a pressure retort.

In the cleaning and processing of dates, no water is used as moisture promotes mold growth. In some cases, if dates are very hard and dry, they may be steamed to hydrate and soften the fruit, but excessive moisture must be avoided. If an adequate supply of figs and dates are available, a plant of this size should prove to be a profitable investment, providing an adequate volume of annual sales is available.

B. MARKET ASPECTS

1. USERS

Households, restaurants, hotels, military services, institutions of various kinds.

2. SALES CHANNELS AND METHODS

Sales are generally made to wholesalers and the larger retail establishments. Some sales may be made direct to large users, e.g., the military services.

3. GEOGRAPHICAL EXTENT OF MARKET

(a) Domestic : This product is well packaged and the value is fairly high in relation to the weight. Distribution should be on a national scale.

(b) Export : An export market should exist for this product in countries where figs and dates are not grown.

4. COMPETITION

(a) Domestic Market : Where these products are grown the major competition would come from fresh figs and dates during the harvesting season.

(b) Export Market : This plant should have no difficulty in competing in the export market.

5. MARKET NEEDED FOR PLANT DESCRIBED

Since there is a very large export market for these products, an urban population of 300,000 should be sufficient to consume the output of this plant that is not exported.

6. GROSS PROFITS

The annual gross sales revenue is estimated at $320,000.
The total fixed investment, plus working capital, is estimated at $161,800.
The annual gross profits, before taxes, is estimated at $95,000.

Based on these figures, the profit on gross sales, before taxes, amounts to about 29.7%.

The annual profit on the total capital requirements, before taxes, would amount to about 58.7%.

7. COST PER MAN EMPLOYED

Forty direct workers and four indirect workers, or a total of 44 workers, are employed.

The total fixed capital investment is estimated at $138,000.

Based on these figures, the fixed investment per man employed would amount to about $3,100.

C. PRODUCTION REQUIREMENTS FIG AND DATE PROCESSING I. P. No. 67261
ANNUAL CAPACITY - ONE SHIFT OPERATION: 160 TONS FIGS, 400 TONS DATES - 3 MONTHS PER YEAR S.I.C. 2034

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES

1. CAPITAL REQUIREMENTS

a. Fixed Capital

		Cost
Land One acre		$ 1,000
Building - 70'x90'		36,000
Equipment, furniture & fixtures		
Prodn. tools & equipment	$ 98,000	
Other tools & equipment	2,000	
Furniture & fixtures	1,000	
Transportation equipment		101,000
Total fixed capital		$ 138,000

Principal items:

7,500 cu. ft. fumigating and storage chamber
2 bucket elevators
grinder
receiving shaker
rotary washer
shaker with drain
traveling basket processor
sorting belt
fig slicer
fig and date grinder
2 date cleaners and seeders
packing table
power press
20 hand presses
2 fumigant dispensers
scales and packing equipment steam boiler (low pressure)

b. Working Capital

	No. of days	
Direct materials	15	$ 5,200
Direct labor	15	1,200
Manufacturing overhead	15	1,300
Administrative costs	15	700
Sales costs	15	1,000
Freight-out, discounts bad debts & allowances	15	500
Sales revenue	15	13,300
Training costs	15	600
Total working capital		$ 23,800

c. Total Capital Requirements $ 161,800

2. MATERIALS AND SUPPLIES

a. Direct materials

	Annual Requirements	Annual Cost
Figs	500 tons	$ 32,500
Dates	500 tons	81,000
Packing materials		11,500
Total direct materials		$ 125,000

b. Supplies

Lubricants & hand tools	50
Cutting tools & abrasives	50
Maintenance & spare parts	1,500
Office supplies	200
Total supplies	$ 1,800

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 50 h.p. connected load	$ 500
Fuel - Production	$ 800
Water - Production and sanitation	$ 200

4. DEPRECIATION

	Yrs. life	Amount
Building	20	$ 1,800
Prodn. tools & equipment	10	4,400
Other tools & equipment	10	200
Furniture & fixtures	10	100
Total depreciation		$ 6,500

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	10,000
Supervisor	2	8,000
Office	1	5,000
Total indirect labor	4	$ 23,000
b. Direct labor		
Skilled workers	4	$ 4,800
Semi-skilled workers	6	5,800
Unskilled workers	30	21,600
Total direct labor	40	$ 32,200

c. Training Needs

Manager and 2 supervisors should be able to train all workers and reach full production in 2 weeks.

6. TRANSPORTATION

a. Own transport equipment

None

b. External transport facilities

Good highways essential.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 125,000	
Direct labor	32,200	
Manufacturing overhead*	32,800	
Total manufacturing cost		$ 190,000
Interest on loans	$ 5,000	
Insurance	400	
Legal	500	
Audit	600	
Contingencies	10,500	
Total administrative cost		$ 17,000
Sales expense		12,000
Freight-out, travel discounts Allowances & bad debts		$ 6,000
Total annual costs		$ 225,000
Annual Gross Profit		$ 95,000
ANNUAL SALES REVENUE		$ 320,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

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I. P. NO. 67261
S. I. C. 2034

OCESSING

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WASHING, FIGS ONLY)

SSING (FIGS ONLY)

SEEDING (DATES ONLY)

SLICING AND GRINDING

FIG AND DATE PROCESSING

SELECTED REFERFNCES

I. TEXTBOOKS

A. Food Dehydration. W. B. Van Arsdel, Volume I--Principles. 196 pp. $11.00.

A. V. I. Publishing Company
Westport, Connecticut 06880

Technology of food preservation.

B. Dehydration of Food. T. N. Morris. 1948. 174 pp. $5.50.

D. Van Nostrand Co., Inc.
120 Alexander Street
Princeton, New Jersey 08540

Deals with the dehydratien of foods.

II. PERIODICALS

A. Food Processing. Monthly. $7.00/year.

Putman Publishing Company
111 East Delaware Place
Chicago, Illinois 60611

B. Food Engineering. Monthly. $20.00/year.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Deals in engineering for the food industry.

III. GOVERNMENT PUBLICATIONS, U. S.

A. Federal Food, Drug, and Cosmetic Act, as amended,
General Regulations for its Enforcement, Title 21, Part 1, $3.00.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

IV. OTHER PUBLICATIONS

A. Food Dehydration. 1964. Vol. II. 732 pp. 161 illus. W. B. Van Arsdel. $24.50.

A. V. I. Publishing Company
Westport, Connecticut 06880

Processing methods of dehydration.

V. TECHNICAL PAPERS

A. Nutritive Value of Foods, Home & Garden Bulletin No. 72. $.25.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by the United States Department of Agriculture.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,249,466 Method for drying at ultra high frequencies.	May 1966	6 p.
B.	Patent No. 3,235,971 Method and apparatus for drying foodstuffs.	February 1966	6 p.
C.	Patent No. 3,224,866 Method for preparing improved preserved fruit.	December 1965	5 p.
D.	Patent No. 3,199,700 Method of process and drying.	January 1965	2 p.
E.	Patent No. 3,197,312 Apparatus for dehydration of figs and dates.	July 1965	5 p.
F.	Patent No. 3,194,670 Method and apparatus for processing figs and dates.	July 1965	3 p.
G.	Patent No. 3,170,803 Provision of dehydrated foods of enhanced flavor.	February 1965	6 p.
H.	Patent No. 3,139, 345 Dehydration of dried fruit.	June 1964	4 p.

VII. TRADE ASSOCIATIONS

No Trade Association could be located which deals exclusively in figs and dates.

National Food Brokers Association
1916 M Street, N. W.
Washington, D. C. 20006

Covers all types of foods.

VIII. ENGINEERING COMPANIES

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IX. DIRECTORIES

A. National Food Brokers Association. Biennially, odd years.
Free of charge to bussiness firms.

National Food Brokers Association
1916 M Street, N. W.
Washington, D. C. 20006

Index of 1,920 member firms, listing their executive personnel.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

WOODEN WARDROBES

I. P. No. 67262
S. I. C. 2511

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. NO. 67262
S.I.C. 2511
DECEMBER 1967

WOODEN WARDROBES

PRODUCT DESCRIPTION

Wooden wardrobe with sliding doors, a hat rack at the top, a shoe rack at the bottom. Size : 6 feet high by 3 1/2 feet wide x 2 feet deep. Other sizes can be made in this plant.

A. GENERAL EVALUATION OF PROSPECTS

The total capital requirements are fairly moderate in comparison with the estimated sales volume and profits. Prospects will depend to a great extent upon the per capita income and whether homes built in the area are designed with ample closet space. Wooden wardrobes are usually used where closet space is insufficient. The local supply of suitable lumber is also an important factor. A comprehensive study should be conducted to determine the existing sales potential and the lumber availability. If results of the survey are favorable, prospects for this industry are good.

B. MARKET ASPECTS

1. USERS

This product would be used principally in homes and hotels with a possible small market in offices and other places of business.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to retail furniture stores and department stores. Sales might be made direct to large hotels. The market for this product will be chiefly in the urban areas and will depend on the per capita income of the families in those areas. This industry requires an investment that will not allow small size operations. Therefore, unless there are other industries within the country that manufacture this product, no domestic competition should exist. This product is well packaged and the selling price would permit nationwide shipping. The bulk of the sales will probably be in urban areas to customers in high income brackets. If suitable raw materials are available locally at reasonable prices, this industry should experience no difficulty in competing with imported products. A plant of this size would not be able to compete in world markets with large, mass production plants.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 300,000.
The total fixed investment, plus working capital, is estimated at $ 146,000.
The annual gross profit, before taxes, is estimated at $ 24,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 8%.
(A gross profit on sales, before taxes, of 8%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 16.4%.

5. COST PER MAN EMPLOYED

Ten direct and six indirect workers, or a total of sixteen workers, are employed.
The total fixed capital investment is estimated at $ 96,000.
Based on these figures, the fixed investment per man employed would amount to about $ 6,000.

C. PRODUCTION REQUIREMENTS WOODEN WARDROBES

I. P. No. 67262
S. I. C. 2511

ANNUAL CAPACITY - ONE SHIFT OPERATION: 10,000 WARDROBES, 72" x 42" x 24"

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. FIXED CAPITAL

	Cost
Land - 2 acres	
Building - one story 60' x 100' with dry kiln. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 96,000

Principal items:

Cutoff Saw, Jointer, Ripsaw, Planer, Trim Saw, Glue Jointer, Glue Reel, Shaper, Boring Machine, Three-drum Sander, Table Sander, Assembly Press, Glue Pots, Spray Both, Compressor

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 50,000

c. Total Capital Requirements $ 146,000

2 MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Lumber	1,180,000 board feet	
Lacquer		
Hardware		
Packaging materials		
Total direct materials		$ 119,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,400

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power. 60 H. P. connected load	
Fuel - Scrap wood is used.	
Water - Production, sanitation and fire protection	$ 1,900

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 8,500

5. MANPOWER

	Number	Annual Cost
a Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct Labor		
Skilled workers	4	
Semi-skilled workers	4	
Unskilled workers	2	
Total direct labor	10	$ 51,200

c. Training needs

The manager should be fully experinced. He and three skilled workers should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Product is well packaged.
Good highways are essential.
Plant should be on railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

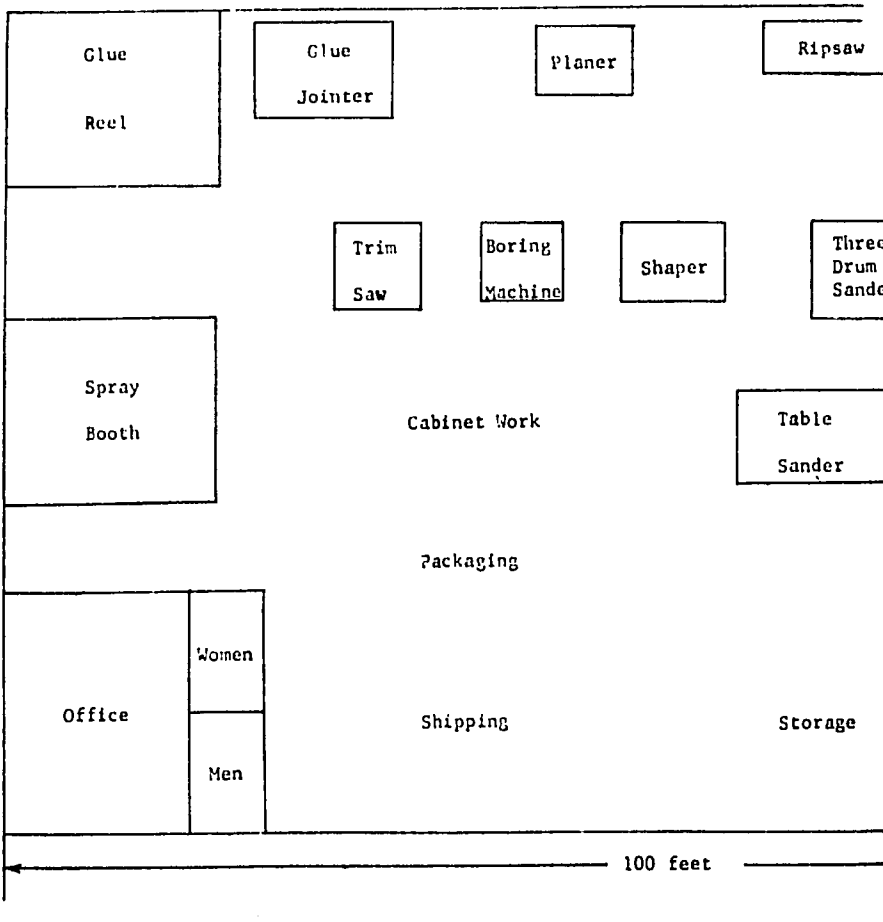
Direct materials	$ 119,000	
Direct labor	51,200	
Manufacturing overhead*	59.800	
Total manufacturing cost		$230,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 24,000
Sales expense		$ 12,000
Freight-out, travel discounts		
Allowances & bad debts		$ 10,000
Total annual costs		$276,000
Annual Gross Profit		$ 24,000
ANNUAL SALES REVENUE		$300,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

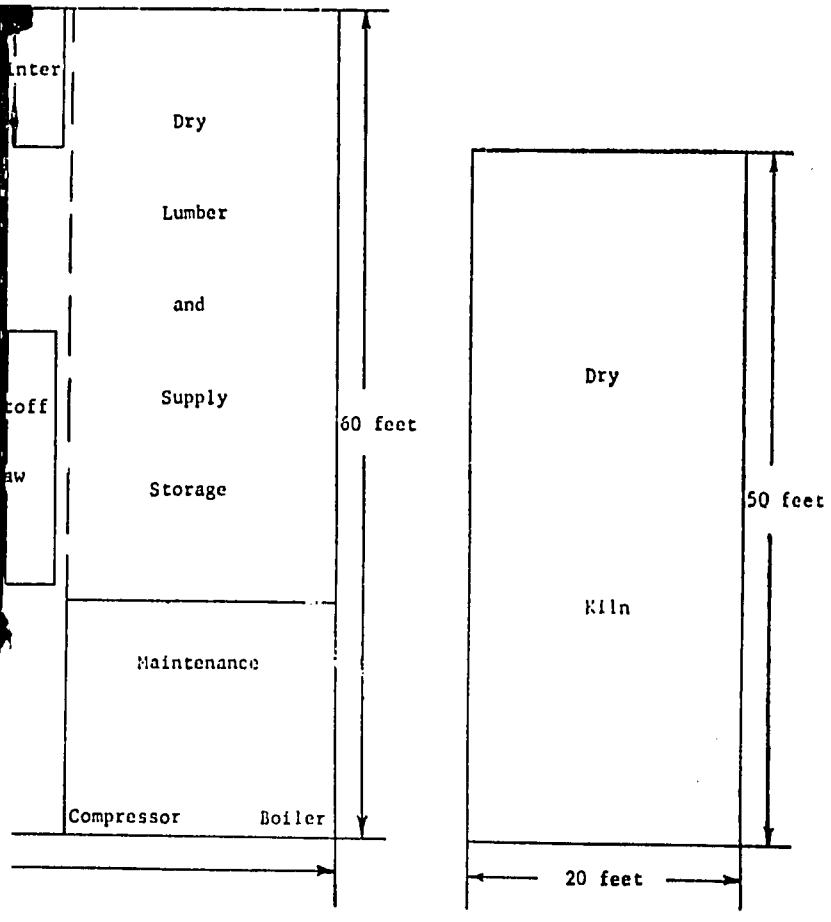
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

WOODEN

PLAN


Glue
Reel
Glue
Jointer
Planer
Ripsaw
Trim
Saw
Boring
Machine
Shaper
Three
Drum
Sande
Spray
Booth
Cabinet Work
Table
Sander
Packaging
Office
Women
Men
Shipping
Storage
100 feet

I. P. NO. 67262
S.I.C. 2511



I.P. No. 67262
S.I.C. 2511

WOODEN WARDROBES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. General Woodworking. 3rd Edition. C. H. Groneman. 1965. 256 pp. Illus. $7.25

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Machine tool processes, hand tool processes, portable tool processes and related woodworking information

B. Wood Machining Processes. Peter Koch. 1964. 530 pp. Illus. $15.00.

The Ronald Press Company
15 East 26th Street
New York, New York 10010

II. TECHNICAL AND TRADE PERIODICALS

A. Wood Working Digest. Monthly. $5.00/year.

Hitchcock Publishing Company
Wheaton, Illinois 60188

Covers the major branches of the wood working industry.

B. Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes and marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $ 1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 197,100. December 1963. 1 p.
Combined storage cabinet and display rack for clothes.

B. Patent No. 188,499. August 1960. 2 p.
Design for a wardrobe type cabinet.

C. Patent No. 188,498. August 1960. 1 p.
Design for a wardrobe type cabinet.

D. Patent No. 186,448. October 1959. 1 p.
Cabinet design with ornamental decoration.

E. Patent No. 180,589. July 1957. 9 p.
Combined wardrobe and clothes rack.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Woodworking Machinery Manufacturers Association
1900 Arch Street
Philadelphia, Pennsylvania 19103

B. National Association of Furniture Manufacturers
666 Lake Shore Drive
Chicago, Illinois 60611

VI. DIRECTORIES

A. Hitchcock's Wood Working Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60187

Lists manufacturers and suppliers for the wood working industries.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

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INDUSTRY PROFILES

DRYERS, LAUNDRY, HOUSEHOLD

I. P. No. 67263
S. I. C. 3633

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Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67263
S.I.C. 3633
DECEMBER 1967

DRYERS, LAUNDRY, HOUSEHOLD

PRODUCT DESCRIPTION

Electric clothes dryer for home use. This dryer is intended to dry 14 pounds of clothing at one time. It has a lint trap in the machine and a vent which blows the hot air outside the house.

A. GENERAL EVALUATION OF PROSPECTS

Electricity is required for the operation of this dryer. Some areas of some countries do not have electric power. And, in many rural areas that have electricity, the per capital income is not high enough to afford this luxury item. The majority of sales for electric dryers will be made in urban areas where per capita income is higher and where electric power is available.

B. MARKET ASPECTS

1. USERS

Households; a larger dryer would be required for commercial purposes.

2. SALES CHANNELS AND EXTENT OF MARKET

These products are usually sold direct to retail stores. Electric clothes dryers cannot be made in small plants Their production requires a fairly large investment in buildings, equipment and materials. The plant described in this profile is intended mainly as an assembly plant. Most of the material needed will be purchased ready for assembly. This includes the motors, completed wiring, switches, nuts and bolts and enamel. Dryers are shipped in cardboard cartons and are easily transported. If sales potential exists nationwide, national distribution should be undertaken. It is mandatory that a thorough anaysis of the potential market be made before establishing this operation. The plant described here should be able to compete against imported washing machines since it will have the advantages of freedom from import taxes and lower freight costs. But a plant of this size could not compete in international markets against large mass producers of dryers.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $350,000.
The total fixed investment, plus working capital, is estimated at $176,200.
The annual gross profit, before Federal taxes, is estimated at $32,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.2%.
(A gross profit on sales, before taxes, of 9.2%, while reflecting U.S. experience should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 18.2%.

5. COST PER MAN EMPLOYED

Eighteen direct and six indirect workers, or a total of twenty-four workers, are employed.
The total fixed capital investment is estimated at $118,000.
Based on these figures, the fixed investment per man employed would amount to about $4,900.

C. PRODUCTION REQUIREMENTS DRYERS, LAUNDRY, HOUSEHOLD I.P. No. 67263
ANNUAL CAPACITY - ONE SHIFT OPERATION : 5,000 UNITS S.I.C. 3633
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital — Cost

Land - one acre
Building - 100' x 100'
Equipment, furniture & fixtures
Prodn. tools & equipment
Other tools & equipment
Furniture & fixtures
Transportation equipment
Total fixed capital — $ 118,000

Principal items :

Square Shear, Punch Press, Milling Machine, Grinding Machine, Screw Machine, Spray Booth, Sheet Metal Brake, Lathes, Drill Press, Arbor Press, Welding Equipment

b. Working Capital (30 days)

Direct materials
Direct labor
Manufacturing overhead
Administrative costs
Sales costs
Freight-out, discounts, bad debts & allowances
Sales revenue
Training costs
Total working capital — $ 176,200

c. Total Capital Requirements — $ 294,200

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Sheet Steel	300 tons	
Motors		
Castings, bolts & nuts		
Wiring & switches		
Enamel		
Cartons		
Total direct materials		$ 115,000

b. Supplies

Lubricants & hand tools
Cutting tools & abrasives
Maintenance & spare parts
Office supplies
Gas, oil and maintenance for truck
Total supplies — $ 4,000

c. Availability of materials & supplies

All should be available locally.
All are available in world markets.

3. POWER, FUEL AND WATER

Annual Cost

Electric Power - 36 H.P. connected load
Fuel - heat as required
Water - sanitation and fire protection
$ 1,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,300

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct labor		
Skilled workers	4	
Semi-skilled workers	5	
Unskilled workers	9	
Total direct labor	18	$ 85,000

c. Training needs

The manager, with the supervisor and 2 skilled workers, should be able to train all workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own Transport equipment

Truck.

b. External transport facilities

The in and out shipments will run about 2 tons per day.

Good highways and railroad, if posible.

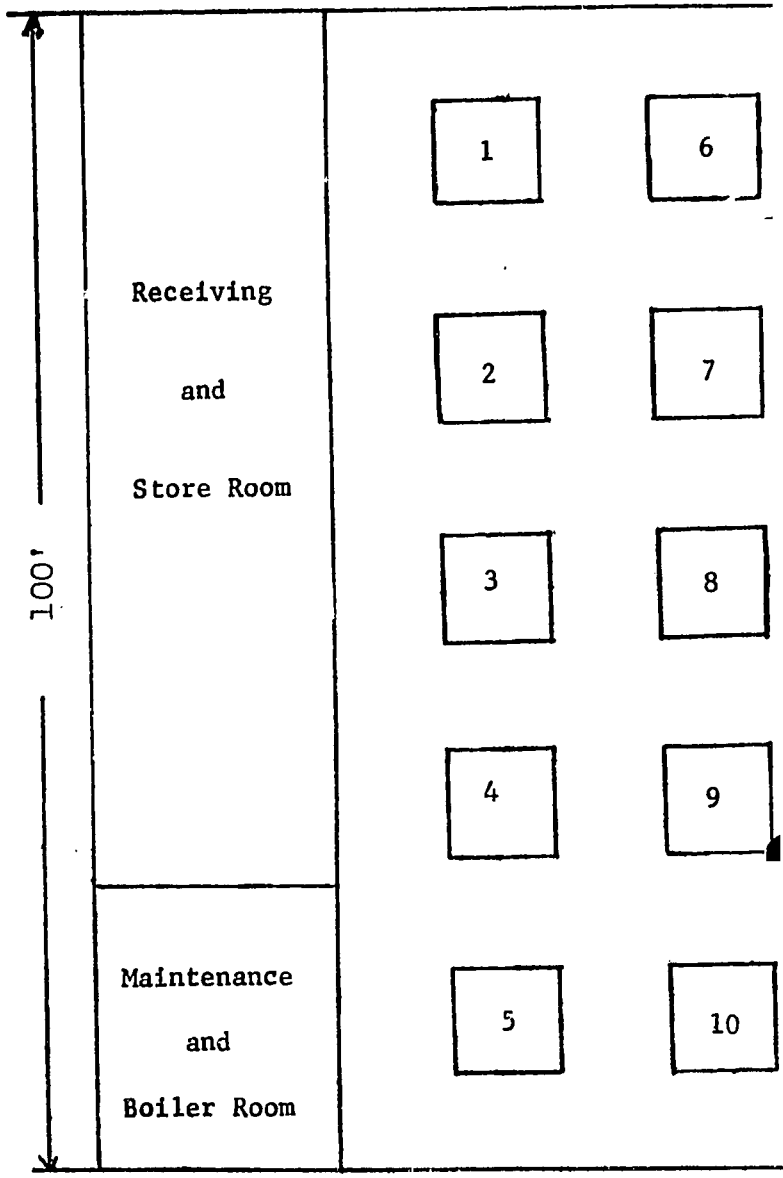
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 115,000	
Direct labor	85,000	
Manufacturing overhead*	60,000	
Total manufacturing cost		$ 260,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 36,000
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 10,000
Total annual costs		$ 318,000
Annual Gross Profit		$ 32,000
ANNUAL SALES REVENUE		$ 350,000

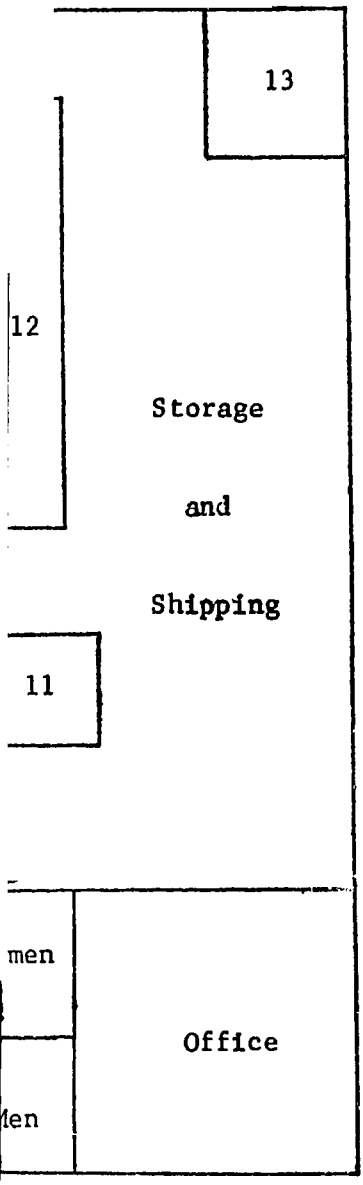
*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

DRYERS, LAUNDRY, HOUSE

PLANT LAYOUT AND WORK



I. P. NO. 67263
S. I. C. 3633



WORK FLOW

1. Square Shears
2. Sheet Metal Brake
3. Punch Press
4. Lathe
5. Milling Machine
6. Drill Press
7. Grinding Machine
8. Arbor Press
9. Keyway Miller
10. Saw Machine
11. Welding Equipment
12. Assembly Conveyor
13. Spray Booth

DRYERS, LAUNDRY, HOUSEHOLD

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. The New American Machinists' Handbook. Report Le Grand. 1,572 pp. 1,000 Illus. $15.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Answers to practical problems in metal working are brought together to aid machinists, designers, draftsmen, and engineers.

B. Machine Tool Operation, Part 1, 5th Edition. Henry D. Burghardt and Aaron Axelrod. 1959. 585 pp. 500 Illus. $8.75

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Deals with the machinists' trade, safety, measuring tools and machine shop operations.

C. Metal Machining and Forming Technology. J. P. Vidosic. 1964. 558 pp. Illus. $11.00

The Ronald Press Company
15 East 26th Street
New York, New York 10010

The fundametals of machine tools and metal cutting processes.

II. TECHNICAL AND TRADE PERIODICALS

A. Machine and Tool Blue Book. Monthly. $5.00/year.

Hitchcock Publishing Company
Wheaton, Illinois 60188

Completely blankets U. S. metal working machinery field.

B. Western Machinery and Steel World. Monthly. $8.00/year.

R. J. Cardinal
43, Cleveland Street
San Francisco, California 94103

Devoted to steel and machinery.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each

A. Patent No. 3,248,799. May 3, 1966 7 p.
Automatic dryer control circuit.

B. Patent No. 3,242,585. March 29, 1966. 6 p.
Automatic dryer control system.

C. Patent No. 3,238,636. March 8, 1966 7 p.
Automatic dryer control system.

D. Patent No. 3,229,380. January 18, 1966 8 p.
Automatic dryer control circuit.

E. Patent No. 3,229,379. January 18, 1966 9 p.
Control system for fabric dryer.

F. Patent No. 3,205,590. September 14, 1965 7 p.
Humidity responsive dryer and control.

G. Patent No. 3,192,642. July 6, 1965 8 p.
Automatic fabric drying machine and control means.

H. Patent No. 3,186,105. June 1, 1965 4 p.
Automatically operated clothes dryer.

I. Patent No. 3,186,104. June 1, 1965 21 p.
Clothes dryer with variable speed centrifuge and heat supply.

J. Patent No. 3,100,144. August 6, 1963. 5 p.
Dryer and method of operation.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Home Laundry Manufacturers Association
20 North Wacker Drive
Chicago, Illinois 60606

Manufacturers of home laundry equipment including washers, dryers, ironers.

B. Association of Home Appliance Manufacturers
20 North Wacker Drive
Chicago Illinois 60606

VI. DIRECTORIES

A. Metal Finishing Guidebook Directory. Annual. No price given

Metals and Plastics Publications
99 Kindermack Road
Westwood, New Jersey 07675

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

BENTWOOD CHAIRS

I. P. No. 67264
S. I. C. 2511

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. NO. 67264
S.I.C. 2511
DECEMBER 1967

BENTWOOD CHAIRS

PRODUCT DESCRIPTION

This chair is made completely of round bentwood with a plastic seat.

A. GENERAL EVALUATION OF PROSPECTS

Altough all pieces of wood in these chairs are bent, only two skilled workers are required since the bending is done in specially prepared forms. The assembly of these chairs does not require highly skilled workers. The chairs are attractive but are not expensive. The total fixed investment for this industry is modest in relation to the annual gross sales and the annual gross profits and the cost per man employed is not excessive. If an adequate supply of wood suitable for bending is available, the prospects for this industry should be favorable.

B. MARKET ASPECTS

1. USERS

Households, hotels, clubs and institutions.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are usually made direct to retail stores, hotels, clubs and institutions. The market for these chairs cannot usually be measured by the total population since low incomes in rural areas may prohibit the purchase of bentwood chairs. The market potential in most countries lies in the urban areas. These products are well crated and the price permits nationwide distribution. Some competition may be expected from small work shops in low-wage countries, particularly from metal or rattan chair producers. Bentwood chairs are not considered an export item and no competition should be encountered from imports.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $120,000.
The total fixed investment, plus working capital, is estimated at $111,800.
The annual gross profit, before taxes, is estimated at $ 8,400.
Using these figures, the profit on gross sales, before taxes, amounts to 7%.
(A gross profit on sales, before taxes, of 7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 7.5%.

5. COST PER MAN EMPLOYED

Eight direct and four indirect workers, or a total of twelve workers, are employed.
The total fixed capital investment is estimated at $ 91,000.
Based on these figures, the fixed investment per man employed would amount to about $7,600.

C. PRODUCTION REQUIREMENTS BENTWOOD CHAIRS
ANNUAL CAPACITY - ONE SHIFT OPERATION: 10,000 CHAIRS
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

I.P. No. 67264
S.I.C. 2511

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 1/2 acre	
Building - 60'x80' and 20'x20' Lean-to shed for vats.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 91,000

Principal items:
Bending Equipment, Radial Saw, Ripsaw, Four-side Molder, Trimsaw, Chucking Machine, Sander, Table Sander, two Boring Machines, Drum Sander, Boiler Assembly Frames.
Spray Booth

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 20,800
c. Total Capital Requirements	$ 111,800

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Lumber	70,000 board feet	
Plastic seats		
Bolts, screws & nails		
Lacquer		
Crating		
Total direct materials		$ 12,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,700

c. Availability of materials & supplies

All should be available locally. All available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 40 H.P. connected load	
Fuel - Scrap wood used	
Water - Sanitation and fire protection	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 8,400

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Foreman	1	
Office	1	
Truck Driver	1	
Total indirect labor	4	$ 31,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	2	
Unskilled workers	4	
Total direct labor	8	$ 36,400

c. Training Needs

The manager and two skilled workers should be able to train all workers and reach full production in two weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

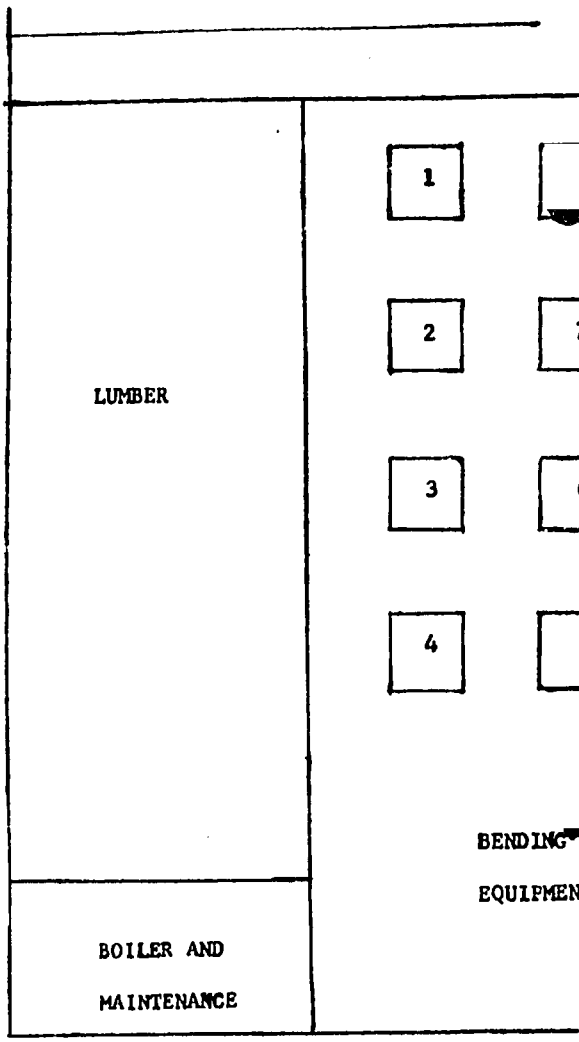
Good highways

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 12,000	
Direct labor	36,400	
Manufacturing overhead*	44,400	
Total manufacturing cost		$ 92,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 9,800
Sales expense		$ 6,000
Freight-out, travel discounts		
Allowances & bad debts		$ 3,000
Total annual costs		$ 111,600
Annual Gross Profit		$ 8,400
ANNUAL SALES REVENUE		$ 120,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLAN



1. Radial Saw
2. Ripsaw
3. Four Side Molder
4. Trim Saw
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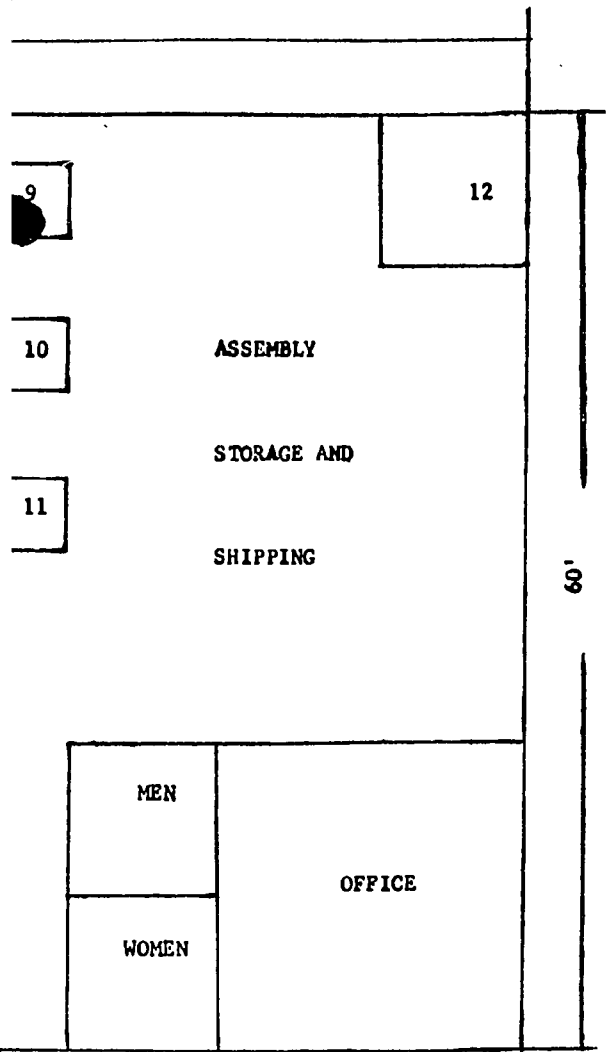
6. Tu
7. Sa
8. Bo

HAIRS

I. P. NO. 67264
S. I. C. 2511

YOUT



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9. Boring Machine
10. Table Sander
11. Drum Sander
12. Spray Booth

I. P. NO. 67264
S. I. C. 2511

BENTWOOD CHAIRS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener. 1966. 474 pp. 1550 Illus. $6.96

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equiqment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp, 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete information on basic woodworking from raw materials through finished product.

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $5.95

D. Van Nostrand Company, Inc.
120 Alexandar Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joints, workshop practice, drawers, bookcases, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company Inc.
Wheaton, Illinois 60188

Devoted to coverage of industrial woodworking.

B. Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes, marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of Small Business Administration, Washington, D. C.

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sideny Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,188,693 June 1965. 9 p.
Joint Construction for furniture.

B. Patent No, 3,152,836. October 13, 1964. 5 p.
Chair Construction.

C. Patent No. 3,131,970. May 5, 1964 5 p.
Seat construction.

D. Patent No. 3,063,483. November 13, 1962 5 p.
Method and process for wood forming.

E. Patent No. 2,948, 323. August, 9, 1960 4 p.
Method and process for wood bending.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Furniture Manufacturers
666 Lake Shore Drive
Chicago, Illinois 60611

B. Furniture Manufacturers Association
103, Pearl Street, N.W.
Grand Rapids. Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188

Lists manufacturers of woodworking machinery and equipment, trade names, trade associations, and other data.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

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BATHROBES

I. P. No. 67265

S. I. C. 2384

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I. P. No. 67265
S. I. C. 2384
DECEMBER 1967

BATHROBES

PRODUCT DESCRIPTION

Bathrobes for both men and women made from skein rayon fiber.

A. GENERAL EVALUATION OF PROSPECTS

Embarking upon a new venture such as this presents no serious problems on a technical level. Little skilled labor is required to produce bathrobes, materials are easily procured. If need be, supplies can be imported. The demand for utilities and transportation is minimal, capital requirements are relatively modest. For these reasons, bathrobe production appears well suited to conditions in many countries seeking to industrialize. Moreover, the factory described in this profile could easily produce other types of clothing such as dresses, blouses and shirts, or it could produce any other items sewn from fabric.

B. MARKET ASPECTS

1. USERS

Men and women.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made mainly to wholesalers for distribution to retail stores and, sometimes, direct to large stores. The market for this product will depend upon the purchasing power of the population. If the per capita income is low in rural areas, the principal market will be in the urban areas. Competition can come from small, one-man shops having only one sewing machine and from that segment of the population that sews clothing in the home. This factory should be able to compete successfully against imported products since it has the advantage of lower transportation costs and freedom from import duties. If possible, these products should be distributed nationally.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 280,000.
The total fixed investment, plus working capital, is estimated at $ 76,800.
The annual gross profit, before taxes, is estimated at $ 20,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.2%.
(A gross profit on sales, before taxes, of 7.2%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 26%.

5. COST PER MAN EMPLOYED

Nineteen direct and five indirect workers, or a total of twenty four workers, are employed.
The total fixed capital investment is estimated at $ 28,000.
Based on these figures, the fixed investment per man employed would amount to about $ 1,200.

C. PRODUCTION REQUIREMENTS - BATHROBES

I.P. No. 67265
S.I.C. 2384

ANNUAL CAPACITY: ONE SHIFT OPERATIONS - 100,000

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land. 5,000 sq. ft.	
Building - one story 30' x 80'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 28,000

Principal items:

Cloth Spreader
Cutting table
Electric cutter
Electric drill
16 Sewing machines
Work tables
Chairs
Steam pressing iron

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 48,800
c. Total Capital Requirements	$ 76,800

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Spun rayon fabric (yds.)	360,000	
Thread	Quantities as required	
Total direct materials		$ 102,000

b. Supplies	
Lubricants & hand tools	
Gas, oil and maintenance for truck	
Maintenance & spare parts	
Office supplies	
Patterns	
Total supplies	$ 2,800

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 20 H. P. connected load Fuel - Heating, as required Water - Sanitation and fire protection	$ 1,175

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 2,725

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Office	2	
Machine Fixer	1	
Truck Driver	1	
Total indirect labor	5	$ 35,000

b. Direct labor		
Skilled workers	1	
Semi-skilled workers	2	
Unskilled workers	16	
Total direct labor	19	$ 73,600

c. Training needs

The manager with one skilled worker should be able to train all workers and reach full production in three weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

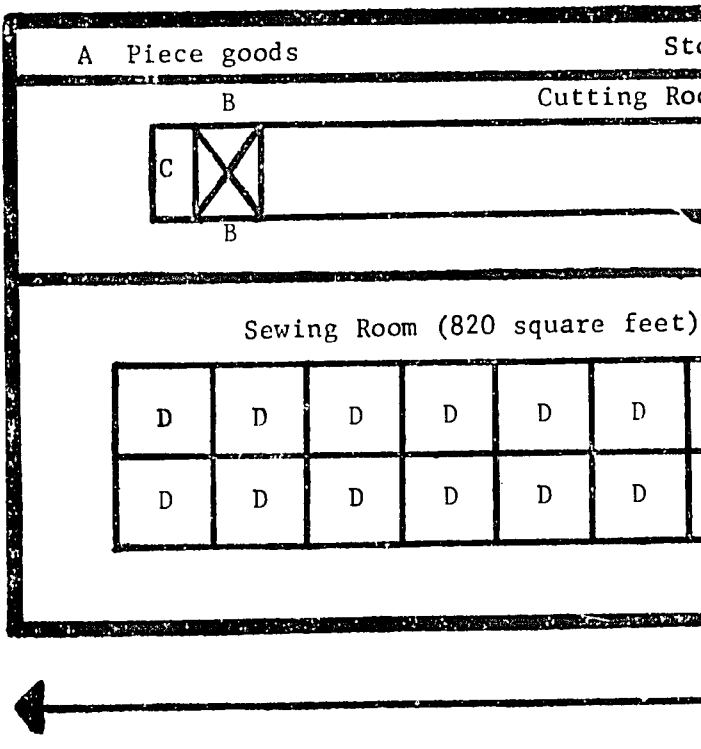
Good highway

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 102,000	
Direct labor	73,600	
Manufacturing overhead*	41,700	
Total manufacturing cost		$ 217,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 24,700
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 6,000
Total annual costs		$ 260,000
Annual Gross Profit		$ 20,000
ANNUAL SALES REVENUE		$ 280,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.


A Piece goods
St
B
Cutting Ro
C
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Sewing Room (820 square feet)
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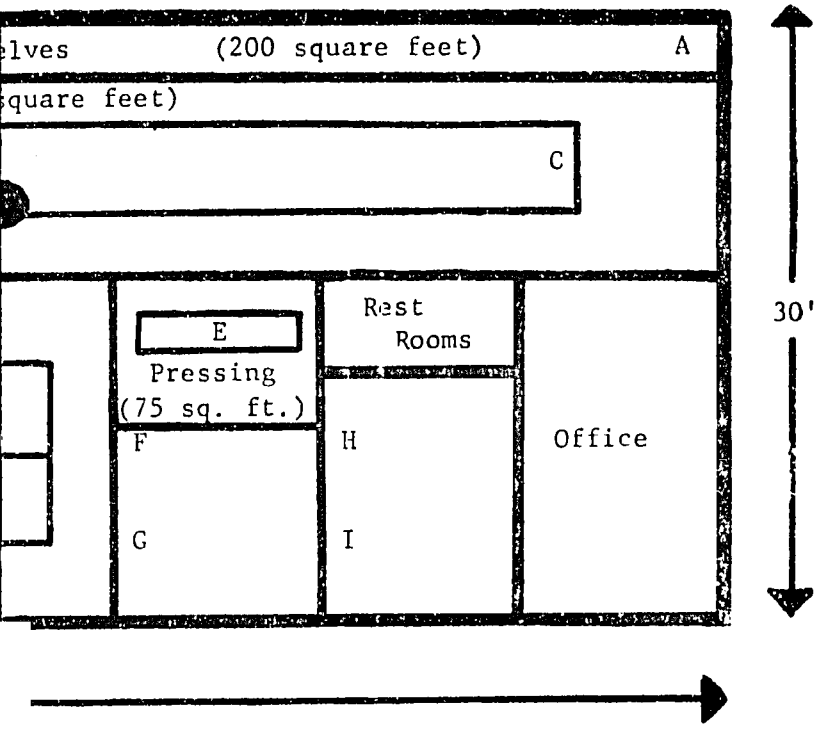
I. P. NO. 67265
S.I.C. 2384



goods
spreader
ng table
th spreading, marking, cutting and assembly
g Machines
ng, Steam Iron
ning
ge of Finished Goods
ng
ge

BATHROBES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Apparel Manufacturing Analysis. Jacob Solinger. 1961. 800 pp. Illus. $25.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Nature and scope of apparel production including raw materials, design, cutting, sewing production equipment and machine operation, molding production, packaging, time and motion study, plant layout, organization, wages, sales engineering and cost controls.

B. Clothing Construction. E. A. Mansfield. 1953. 454 pp. Illus. $7.50

Houghton Mifflin Company
2 Park Street
Boston, Massachusetts 02108

Covers all types of clothing manufacture.

II. TECHNICAL AND TRADE PERIODICALS

A. Apparel Manufacturer. Monthly. $5.00/year

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Information about the apparel manufacturing industry; new processes, equipment, products.

B. The Bobbin Magazine. Monthly. $4.00

Needle Trades Publishing Company
P. O. Box 1354
Columbia, South Carolina 29202

Management magazine for needle trades industries.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

C. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

V. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,176,315. April 6, 1965. 3 p.
Combination beach robe and blanket.

B. Patent No. 3,065,471. November 27, 1962. 4 p.
Garment.

C. Patent No. 2,973,523. March 7, 1961. 2 p.
Garment.

D. Patent No. 2,691,167. October 12, 1954. 3 p.
Dressing gown.

E. Patent No. 2,616,085. November 4, 1952. 5 p.
Protective garment.

F. Patent No. 2,603,789. July 22, 1952. 3 p.
Bed jacket and similar wearing apparel.

G. Patent No. 2,555,962. June 5, 1951. 3 p.
Protective gown.

VI. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Apparel Manufacturers Association, Inc.
2,000 'K" Street, N. W.
Washington, D. C. 20006

B. Manufacturers Association of Robes, Leisurewear, Shirts & Rainwear
331 Madison Avenue
New York, New York 10017

VII. DIRECTORIES

A. Apparel Manufacturers Directory. Annual. $3.00.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists 5,000 supplies of garment industry fabrics, trimmings, machinery and equipment.

VIII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

COFFEE TABLES, END TABLES AND BED STANDS

I. P. No. 67266
S. I. C. 2511

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67266
S.I.C. 2511
DECEMBER 1967

COFFEE TABLES, END TABLES AND BED STANDS

PRODUCT DESCRIPTION

Various designs and sizes of coffee tables, end tables and bed stands.

A. GENERAL EVALUATION OF PROSPECTS

The total capital requirements of this industry are fairly moderate in comparison with the estimated sales volume and profits. The prospects for this industry will depend to a great extent upon the per capita income and the kind of furniture generally used by upper income level families in the country's urban areas. The availability of a local supply of suitable lumber is also an important factor. A comprehensive survey should be conducted to ascertain the sales potential for these products; the availability of the raw materials and, if the results look promising, this industry should represent a profitable investment.

B. MARKET ASPECTS

1. USERS

These products will be used principaIly in homes, hotels and clubs.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to retail furniture stores, department stores and, in some cases, direct to hotels. The market for these products, in many countries, will be chiefly in the urban areas and will depend on a relatively high per capita income of families in those areas. These products are well packaged and the selling price would permit nationwide distribution. However, since sales potential is concentrated in the cities, national distribution may not be necessary. This industry cannot be operated successfully on a small volume basis. Therefore, unless other plants exist within the country manufacturing the same products, large volume production and small competition can be expected. If the raw materials are readily available and the plant is efficiently managed and operated, this industry should be able to compete with imported products. A plant of this size could not compete in international market because special designs are usually required for success in furniture exporting.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $270,000
The total fixed investment, plus working capital, is esimated at $177,600.
The annual gross profit, before taxes, is estimated at $20,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.4%.
(A gross profit on sales, before taxes, of 7.4%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 11.3%.

5. COST PER MAN EMPLOYED

Fourteen direct and six indirect workers, or a total of twenty workers, are employed.
The total fixed capital investment is estimated at $132,000.
Based on these figures, the fixed investment per man employed would amount to $6,600.

C. PRODUCTION REQUIREMENTS COFFEE TABLES, END TABLES AND BED STANDS — I.P. NO. 67266 S.I.C. 2511

ANNUAL CAPACITY - ONE SHIFT OPERATION: 7,000 COFFEE TABLES, 8,000 END TABLES, 7,000 BED STANDS

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 2 acres	
Building - 100' x 100' -- one story and dry kiln. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 132,000

Principal items:

Cutoff Saws, Ripsaw, Jointer, Planer, 2 Trim Saws, Glue Jointer, Glue Reel, Shaper, 2 Boring Machines, Turning Lathe, Three-drum Sander, Turning Sander, Table Sander, Chucking Machine, Assembly Presses, Glue Pots, Spray Booth, Compressor

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 45,600

c. Total Capital Requirements $ 177,600

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Lumber	400,000 bd. ft.	
Lacquer		
Packaging material		
Total direct materials		$ 79,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 5,000

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 70 H.P. connected load	
Fuel - Scrap wood used	
Water - Production, sanitation and fire protection	$ 2,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,900

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager & Supervisor	2	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 44,000
b. Direct labor		
Skilled workers	5	
Semi-skilled workers	4	
Unskilled workers	5	
Total direct labor	14	$ 68,000

c. Training needs

The manager and supervisor must be fully experienced. They, with three skilled workers, should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Products are well packaged.
Good highways essential.
Plant should be located on railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES

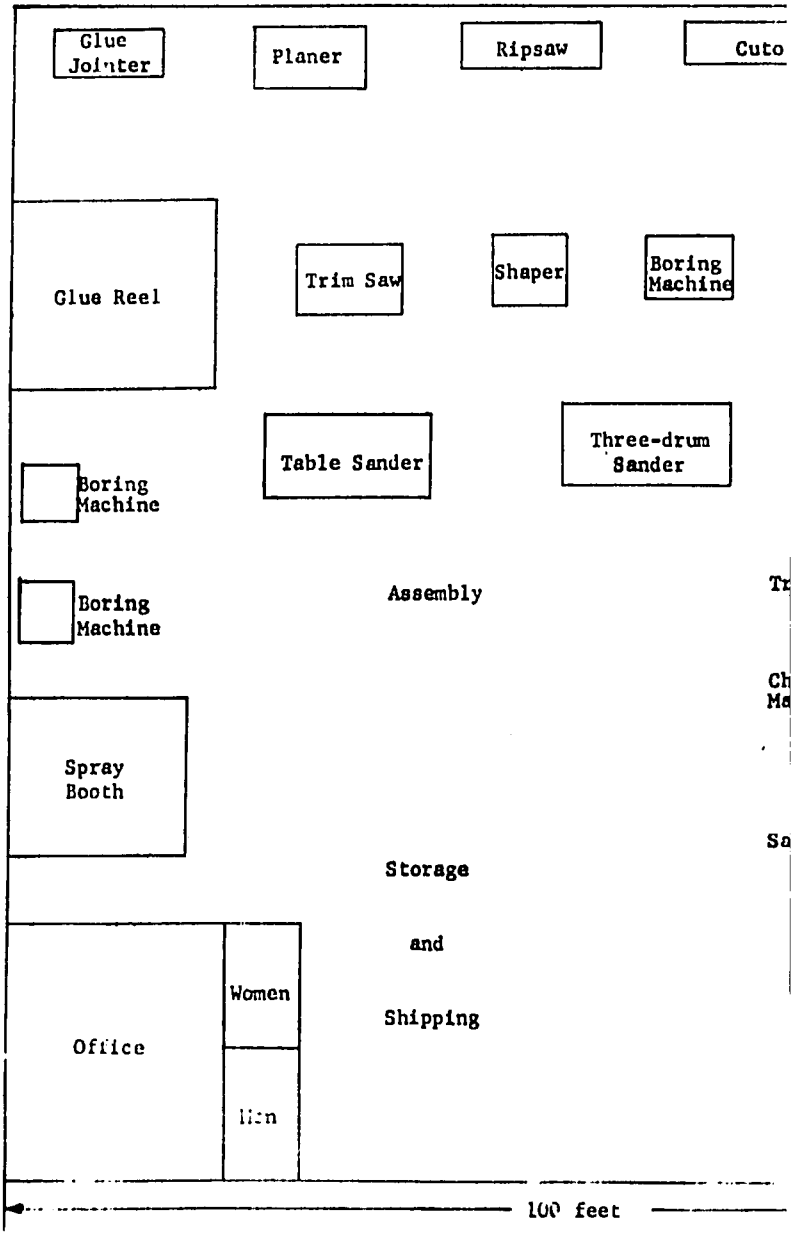
REVENUE		
Direct materials	$ 79,000	
Direct labor	68,000	
Manufacturing overhead*	59,600	
Total manufacturing cost		$ 206,600
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 19,400
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 250,000
Annual Gross Profit		$ 20,000
ANNUAL SALES REVENUE		$ 270,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

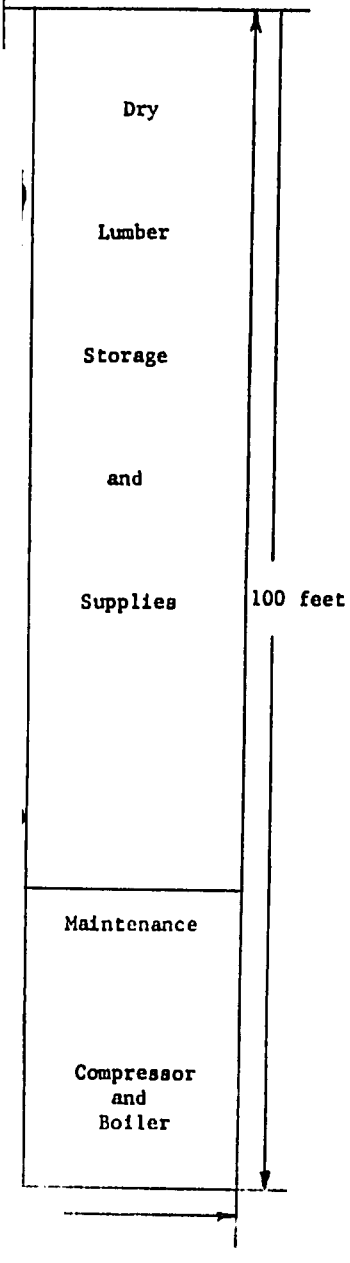
COFFEE TABLES, END

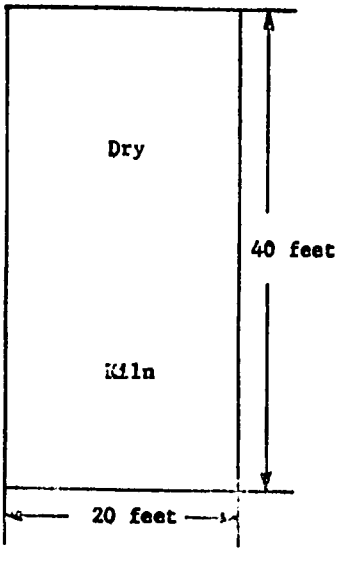
PLANT LAY



I. P. NO. 67266
S.I.C. 2511

WORKFLOW





COFFEE TABLES, END TABLES AND BED STANDS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener. 1966. 474 pp. 1550 Illus. $6.96.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equipment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp. 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete information on basic woodworking from raw materials through finished product

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $5.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joints, workshop practice, drawers, bookcases, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188
Devoted to coverage of industrial woodworking.

B. Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes, marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

IV. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,166,013 Furniture construction of disassembled furniture.	January 19, 1965	5 p.
B.	Patent No. 2,915,350 Table construction constructed for rapid and easy assembly.	December 1, 1959	4 p.
C.	Patent No. 2,717,815 Coffee table.	1955	3 p.
D.	Patent No. 2,386,739 Coffee table.	1945	3 p.
E.	Des. No. 204,990 Design of end table.	June 7, 1966	1 p.
F.	Des. No. 204,989 Design for coffee or lunch type table.	June 7, 1966	2 p.
G.	Des. No. 203,453 Design of modern style coffee table.	June 11, 1966	1 p.
H.	Des. No. 203,451 Design of a coffee table.	January 11, 1966	1 p.
I.	Des. No. 203,448 Design of a coffee type table.	January 11, 1966	1 p.
J.	Des. No. 196,240 Design for a night table.	September 10, 1963	1 p.
K.	Des. No. 196,844 Chair side table	November 12, 1963	1 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Furniture Manufacturers
666 Lake Shore Drive
Chicago, Illinois 60611

B. Furniture Manufacturers Association
103, Pearl Street, N. W.
Grand Rapids, Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00
Hitchcock Publishing Company
Wheaton, Illinois 60188
Lists manufacturers and suppliers for the woodworking industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

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INDUSTRY PROFILES

LADIES COTTON BROADCLOTH DRESSES

I. P. No. 67267
S. I. C. 2335

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

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LADIES COTTON BROADCLOTH DRESS

PRODUCT DESCRIPTION

Woman's dresses made from cotton broadcloth.

A. GENERAL EVALUATION OF PROSPECTS

The machinery and equipment used to produce ladies' dresses is the type used generally throughout the clothing manufacture business. Therefore, it is possible for this plant to make other kinds of clothing or other items made from fabric. The amount of capital required is relatively modest and if the domestic market can produce the sales required and the plant is efficiently operated and managed well, prospects for this industry should be very good.

B. MARKET ASPECTS

1. USERS

Ladies and teenage girls will use this product.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to large stores and to wholesale houses for distribution to small retail outlets. The market needed will depend to a great extent upon the purchasing power of the local population. Competition would arise from other plants, similar to this, producing ladies cotton dresses, and from that part of the populatien which does sewing in the home. These products should be distributed nationally. Competition from imported cotton broadcloth dresses should be negligible.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and speciallized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4- SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $400,000.
The total fixed investment, plus working capital, is estimated at $118,100.
The annual gross profit, before taxes, is estimated at $36,000.
Using these figures, the profit on gross sales, before taxes, amount to 9%.
(A gross profit on sales, before taxes, of 9%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 30.5%.

5. COST PER MAN EMPLOYED

Twenty-four direct and five indirect workers, or a total of twenty-nine workers, are employed.
The total fixed capital investment is estimated at $31,500.
Based on these figures, the fixed investment per man employed would amount to about $1,100.

C. PRODUCTION REQUIREMENTS LADIES COTTON BROADCLOTH DRESSES

I. P. No. 67267
S.I.C. 2335

ANNUAL CAPACITY : ONE SHIFT OPERATION: 72,000 DRESSES
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a FIXED CAPITAL

	Cost
Land - 8,000 square feet	
Building - one story, 30' x 80' May use any suitable material	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 31,500

Principal Items :

Cloth Spreader
Cutting Table
Cutting Machine
Marking Drill
20 Sewing Machines
Steam Iron
Work Tables
Stands
Racks

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 86,600

c. Total Capital Requirements $118,100

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Broadcloth, combed	Material in types and quantities as required	
Thread		
Hooks & eyes		
Zippers		
Trimming		
Boxes		
Total direct materials		$144,600

b. Supplies

Lubricants & hand tools	
Gas, oil and maintenance of truck	
Maintenance & spare parts	
Office supplies	
Total supplies	$ 3,100

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - About 22 H. P. connected load Fuel - Heating Water - sanitation and fire protection.	$ 1,350

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 2,950

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Office	2	
Machine Fixer	1	
Truck Driver	1	
Total indirect labor	5	$ 34,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	20	
Unskilled workers	2	
Total direct labor	24	$ 119,200

c. Training needs

The manager, machine fixer, and two skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments about one ton per day.

Good highways.

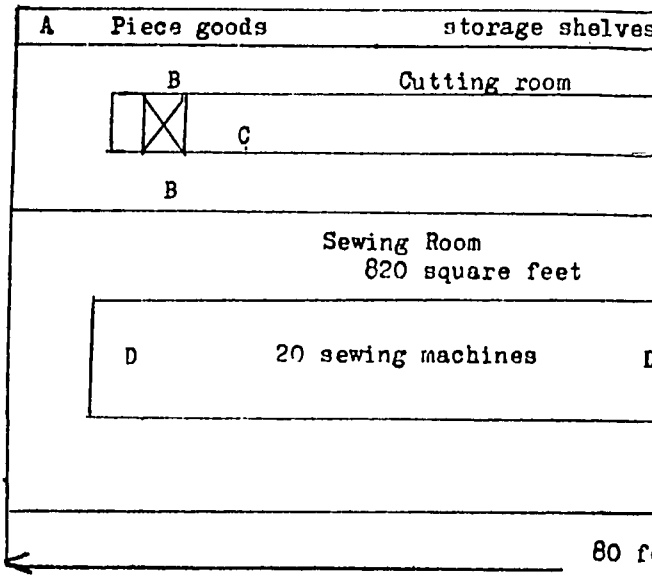
7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$144,600	
Direct labor	119,200	
Manufacturing overhead*	41,400	
Total manufacturing cost		$ 305,200
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 28,800
Sales expense		$ 18,000
Freight-out, travel discounts Allowance & bad debts		$ 12,000
Total annual costs		$ 364,000
Annual Gross Profit		$ 36,000
ANNUAL SALES REVENUE		$ 400,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

LADIES COTTON

PLANT LAYOU

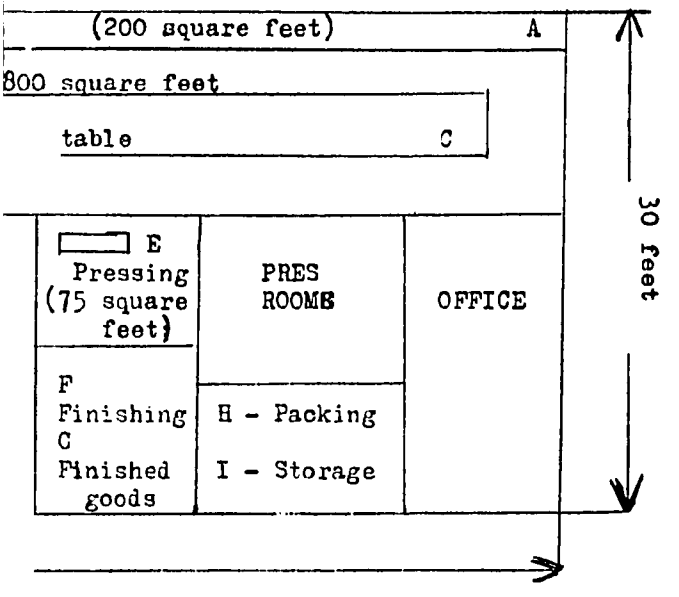


A -- A. Piece goods
B — B. Cloth spreader
C — C. Cutting table
cloth spread
D — D. Sewing machines
E. Steam iron, pressi
F. Finishing
G. Finished goods, st
H. Packing
I. Storage

CLOTH DRESSES

I. P. NO. 67267
S.I.C. 2335

WORK FLOW



cutting and assembly

I. P. No. 67267
S. I. C. 2335

LADIES' COTTON BROADCLOTH DRESSES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. The Progressive Sewing Room. B. Frank. 1957. $6.00

Fairchild Publications, Inc.
7 East 12th Street
New York, New York 10003

Progressive sewing techniques in the garment industry.

B. Apparel Manufacturing Analysis. Jacob Solinger. 1961. 800 pp. Illus. $25.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Nature and scope of apparel production including raw materials, design, cutting, sewing production equipment and machine operation, molding production, packaging, time and motion study, plant layout, organization, wages, sales engineering and cost controls.

C. Clothing Construction. E. A. Mansfield. 1953. 454 pp. Illus. $7.50

Houghton Miflin Company
2 Park Street
Boston, Massachusetts 02108

Covers all types of clothing manufacture.

II. TECHNICAL AND TRADE PERIODICALS

A. Women's Wear Daily. $20.00/year outside U. S.

Fairchild Publications, Inc.
7 East 12th Street
New York, New York 10003

News and information concerning styles, markets, source of supplies and management in the women's wear industry.

B. Apparel Manufacturer. Monthly. $5.00/year

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Information about the apparel manufacturing industry; new processes, equipment, products.

C. The Bobbin Magazine. Monthly. $4.00.

Needle Trades Publishing Company
P. O. Box 1354
Columbia, South Carolina 29202

Management magazine for the needle trades industries.

III. BUSINESS MANAGEMENT MATERIALS

A. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESSENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,261,024 Skirt.	July 1966	7 p.
B.	Patent No. 3,025,577 Dress.	March 1966	3 p.
C.	Patent No. 2,875,445 Garment.	March 1959	3 p.
D.	Patent No. 2,849,716 Dress.	September 1958	5 p.
E.	Patent No. 2,835,897 Garment.	May 1958	4 p.
F.	Patent No. 2,665,428 Garment.	January 1954	7 p.

V. TECHNICAL INSTITUES AND TRADE ASSOCIATIONS

A. American Apparel Manufacturers Association, Inc.
2000 "K" Street, N. W.
Washington, D. C. 20006

VI. DIRECTORIES

A. Apparel Manufacturers Directory. Annual. $3.00

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists 5,000 suppliers of garment industry fabrics, trimmings, machinery and equipment.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

MEN'S WASH AND WEAR PANTS

I. P. No. 67268
S. I. C. 2327

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67268
S.I.C. 2327
DECEMBER 1967

MEN'S WASH AND WEAR PANTS

PRODUCT DESCRIPTION

Men's pants made from wash and wear materials; four pockets; waist sizes 28 to 44 inches; length from 30 to 36 inches.

A. GENERAL EVALUATION OF PROSPECTS

Wash and wear pants are readily marketable because they are low-priced compared with slacks. The investment needed to establish this plant is small when compared with the number of men employed and the gross profit estimate is favorable. The machinery and equipment used to produce men's pants is of the same type used in the apparel industry to manufacture other types of clothing. Therefore, this plant could manufacture other wearable items or products of any kind that are made from fabric.

B. MARKET ASPECTS

1. USERS

Men and teenagers in all walks of life.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made directly to large stores and to wholesalers for resale to small retailers. The domestic rate of consumption of men's wash and wear pants will depend primarily upon wage levels and clothing habits of the population. The product is well packaged in cardboard boxes and can be transported easily anywhere within the country. Some export sales to neighboring nations not having a factory producing wash and wear pants might be possible. These pants should prove popular to men and boys since dry cleaning is not necessary. The relatively small size of this plant will prevent it from competing with large mass producers of men's pants in the international market.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $500,000.
The total fixed investment, plus working capital, is estimated at $153,000.
The annual gross profit, before taxes, is estimated at $ 48,000.
Using these figures, the profit, on gross sales, before taxes, amounts to about 9.6%.
(A gross profit on sales, before taxes, of 9.6%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 31.5%.

5. COST PER MAN EMPLOYED

Twenty-nine direct and eight indirect workers, or a total of thirty-seven workers, are employed.
The total fixed capital investment is estimated at $ 74,000.
Based on these figures, the fixed investment per man employed would amount to about $2,000.

C. PRODUCTION REQUIREMENTS - MEN'S WASH AND WEAR PANTS — I.P. No. 67268
ANNUAL CAPACITY - ONE SHIFT OPERATION : 15,000 DOZEN — S.I.C. 2327

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - about 1/2 acre	
Building - one story, 60'x100'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 74,000

Principal items:

Cutting tools	2 Trim masters
Cloth spreader	Turning stands
Cloth unwinder	3 Hand trucks
Electric knives	Stacker
Electric drill	Chairs
28 sewing machines	Racks
Folding machine	Benches
Presser	

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 79,000
c. Total Capital Requirements	$ 153,000

2. MATERIALS AND SUPPLIES

Direct Materials	Annual Requirements	Annual Cost
Drill	In quantities needed	
Thread		
Zippers		
Size tags (paper)		
Table woven		
Boxes		
Shipping cartons		
Total direct materials		$ 152,000

b. Supplies	
Lubricants & hand tools	
Gas, oil and maintenance of truck	
Maintenance & spare parts	
Office supplies	
Total supplies	$ 2,800

c. Availability of materials & supplies

All should be available locally.
All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 100 H. P. connected load	
Fuel - any suitable local bark	
Water - Sanitation and fire protection	$ 3,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 6,100

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager & 3 Supervisors	4	
Office	2	
Machine Fixer	1	
Truck Driver	1	
Total indirect labor	8	$ 64,000
b. Direct Labor		
Skilled workers	3	
Semi-skilled workers	24	
Unskilled workers	2	
Total direct labor	29	$ 145,200

c. Training needs

Manager, 3 supervisors and 2 skilled workers should be able to train all workers and reach full production after thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments less than one ton per day.

Good highway.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct Materials	$ 152,000	
Direct labor	145,200	
Manufacturing overhead*	76,600	
Total manufacturing cost		$ 373,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 30,200
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$ 452,000
Annual Gross Profit		$ 48,000
ANNUAL SALES REVENUE		$ 500,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

MEN'S WAS

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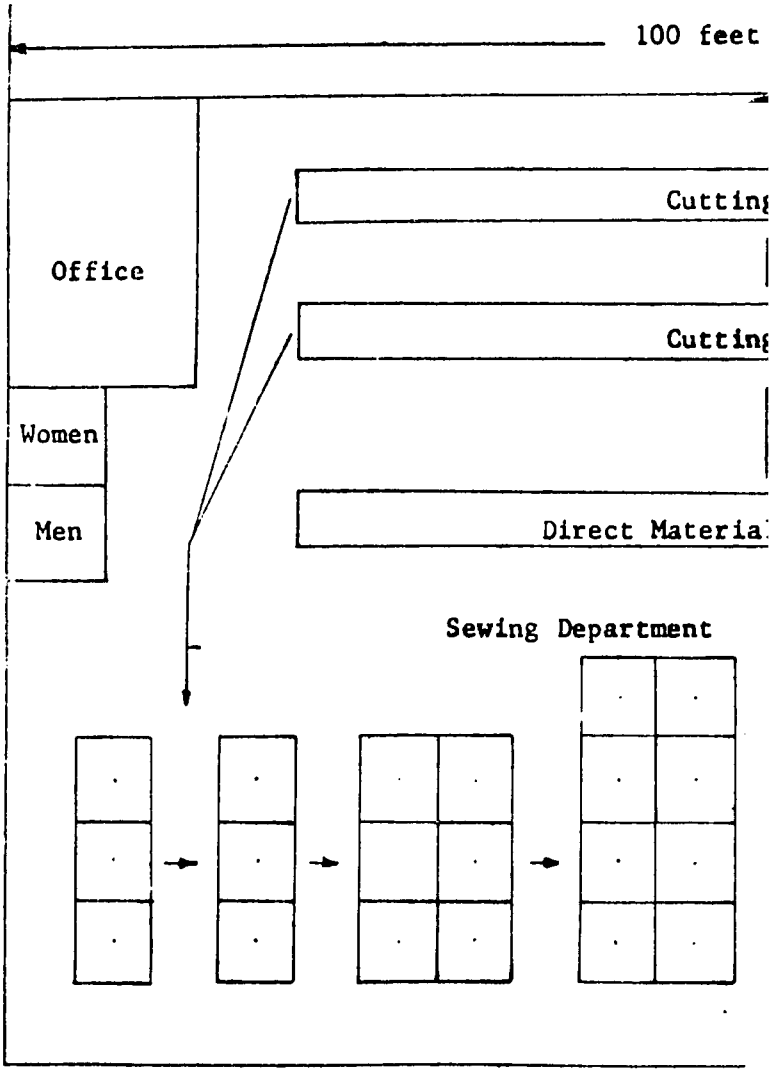
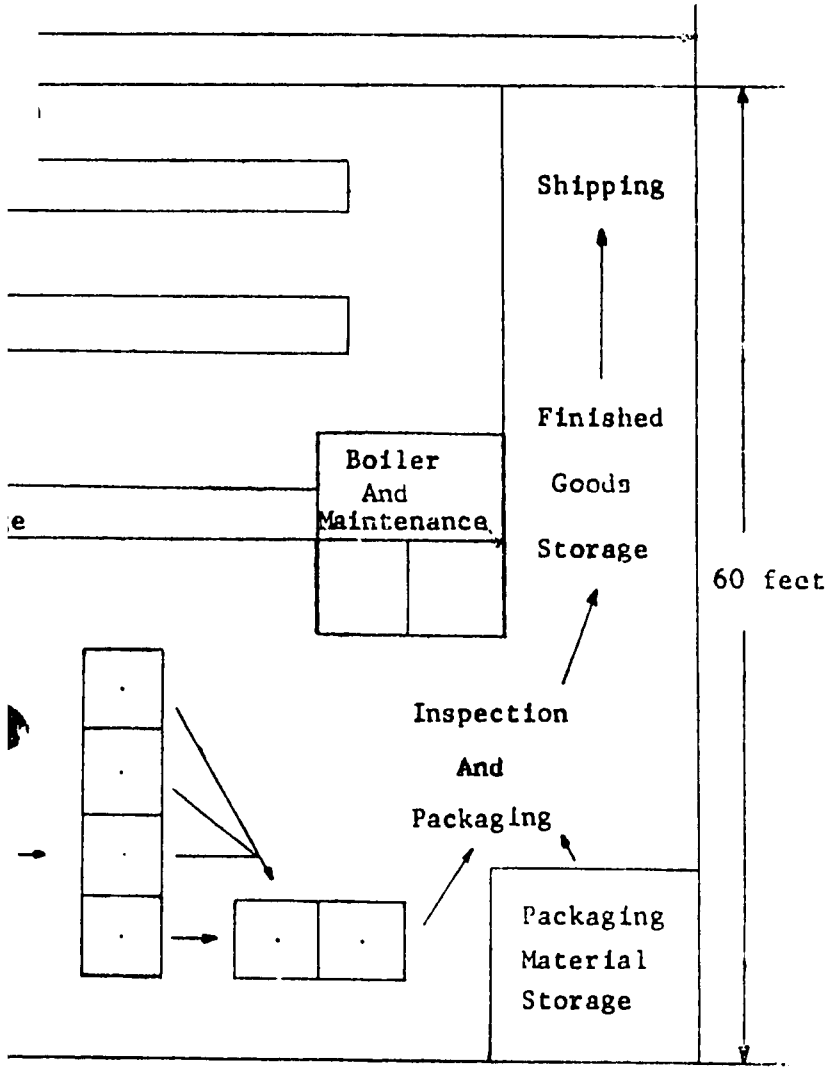


WEAR PANTS

I.P. NO. 67268
S.I.C. 2327

ND WORKFLOW



I.P. No. 67268
S.I.C. 2327

MEN'S WASH AND WEAR PANTS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Apparel Manufacturing Analysis. Jacob Solinger. 1961. 800 pp. Illus. $25.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Nature and scope of apparel production including raw materials, design, cutting, sewing, production equipment and machine operation, molding production, packaging, time and motion study, plant layout, organization, wages, sales engineering and cost controls.

B. Clothing Construction. E. A. Mansfield. 1953. 454 pp. Illus. $7.50

Houghton Mifflin Company
2 Park Street
Boston, Massachusetts 02108

Covers all types of clothing manufacture.

II. TECHNICAL AND TRADE PERIODICALS

A. Men's Wear. Semi-monthly. $5.00/year

Fairchild Publications, Inc.
7 East 12th Street
New York, New York 10003

Contemporary survey of the men's wear industry.

B. Apparel Manufacturer. Monthly. $5.00/year.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

C. The Bobbin Magazine. Monthly. $4.00

Needle Trades Publishing Company
P. O. Box 1354
Columbia, South Carolina 29202

Management magazine for the needle trades industries.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C.

A.	Patent No. 3,246,342 Wearing apparel.	April 19, 1966	5 p.
B.	Patent No. 3,214,770 Garment, trouser type.	November 2, 1965	4 p.
C.	Patent No. 2,977,601 Men's pants for work or sports.	1961	3 p.
D.	Patent No. 2,883,674 Onsiam garment construction.	April 28, 1959	4 p.
E.	Patent No. 2,778,026 Making men's work pants and pockets thereof.	1957	3 p.
F.	Patent No. 2,755,481 Men's work pants with aajustable waist and seat.	1956	4 p.
G.	Patent No. 2,742,647 Trousers and support therefor.	April 24, 1956	7 p.
H.	Patent No. 2,714,720 Trouser leg construction.	April 9, 1955	2 p.
I.	Patent No. 2,702,545 Trouser leg construction.	Februery 22, 1955	5 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Apparel Manufacturers Association, Inc.
2000 "K" Street, N. W.
Washington, D. C. 20006

B. National Outerwear and Sportswear Association
347 Fifth Avenue
New York, New York 10016

C. Trouser Institute of America
347 Fifth Avenue
New York, New York 10016

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INDUSTRY PROFILES

CASTOR OIL AND MEAL

I. P. No. 67269
S. I. C. 2093

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I.P. No. 67269
S.I C. 2093
DECEMBER 1967

CASTOR OIL AND MEAL

PRODUCT DESCRIPTION

Castor oil is extracted from castor beans, leaving a by-product of castor meal.

A. GENERAL EVALUATION OF PROSPECTS

It is the current custom to contract with the farmer in advance for the growing of castor beans. This should be given consideration in evaluating the prospects for this plant. The fixed investment is slightly more than half of the gross sales and a very good profit is shown on the capital requirements as well as on the gross sales. Since the oil is used principally for medical and lubricating purposes, a comprehensive study should be made to determine the potential sales volume for both the oil and the meal.

B. MARKET ASPECTS

1. USERS

This product is used by other industries for medicinal and lubricating purposes.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to other industries. The product is well packaged in drums and in 100 pound bags; therefore, with good highways, the product could be distributed nationally. Castor oil cannot be produced profitably on a small scale since a large investment is required. The only domestic competition would come frorm other large castor oil plants. Castor beans are raised principally in tropical climates and castor oil is a natural export of tropical countries. If this plant is well managed and efficiently operated, it should have no difficulty in competing in world markets. A comprehensive market survey should be conducted, however.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $1,050,000.
The total fixed investment, plus working capital, is estimated at $767,600.
The annual gross profit, before taxes, is estimated at $130,000.
Using these figures, the profis on gross sales, before takes, amounts to about 12.4%.

(A gross profit on sales, before taxes, of 12.4%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)

The annual profit on the total capital requirements, before taxes, is estimated at 16.9%.

5. COST PER MAN EMPLOYED

Twelve direct and fourteen indirect workers, or a total of twenty-six workers, are employed.
The total fixed capital investment is estimated at $601,000.
Based on these figures, the fixed investment per man employed would amount to $23,100.

C. PRODUCTION REQUIREMENTS - CASTOR OIL AND MEAL I.P. NO. 67269
ANNUAL CAPACITY - THREE-SHIFT OPERATION: 2,250 TONS OIL, 2,750 TONS MEAL S.I.C. 2093

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - one acre	
Building 20'x100'x20' & 20'x40'x20' to 20'x30'x20' storage tanks & elevators	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 601,000

Principal items:

Storage	Steam generator
Scale	Cooling tower
Cleaner	Meal bagging scale
Cooker	Huller
Oil expeller	
Tanks	
Pumps	
Heat exchangers	
Agitators	
Filter	
Press-cake coller	
Conveyors	
Bucket elevators	

b. Working Capital (30 Days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 166,600

c. Total Capital Requirements $ 767,600

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Castor beans	5,000 short tons	
Drums		
Bags 100 lbs.		
Total direct materials		$ 573,000

b. Supplies

Lubricants & hand tools
Gas, oil and maintenance of truck
Maintenance & spare parts
Office supplies
Chemicals and detergents

Total supplies $ 11,000

c. Availability of materials & supplies

All should be available locally.
All are available on world market.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 2160 KWH per day	
Fuel - Bunker oil	
Water - Production, sanitation and fire protection	$ 10,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 41,800

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager & 3 supervisors	4	
Office	3	
Shift clerks	3	
Maintenance	3	
Truck driver	1	
Total indirect labor	14	$ 98,000
b. Direct labor		
Skilled workers	3	
Semi-skilled workers	3	
Unskilled workers	6	
Total direct labor	12	$ 54,600

c. Training needs

Manager and three supervisors should be able to train all workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transportation equipment

One truck.

b. External transport facilities

In and out shipments 40 tons per day. Good highway and railroad siding.

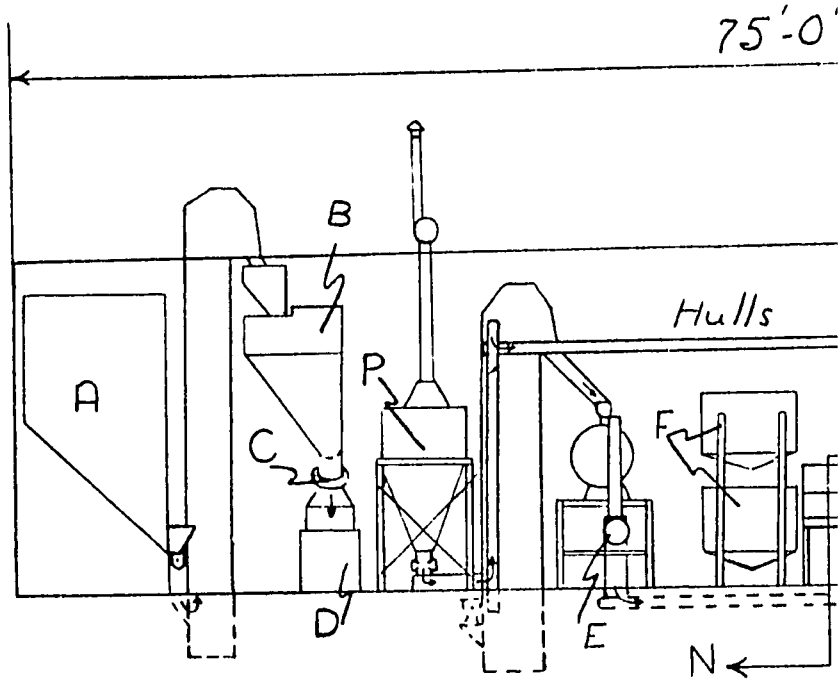
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 573,000	
Direct labor	54,600	
Manufacturing overhead*	161,500	
Total manufacturing cost		$ 789,100
Interest on loans		
Insurance		
Legal		
Audit		
Contigencies		
Total administrative cost		$ 70,900
Sales expense		$ 36,000
Freight-out travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$ 920,000
Annual Gross Profit		$ 130,000
ANNUAL SALES REVENUE		$ 1,050,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

CASTOR OI

ELEVATION OF CASTOR OIL EXPRESSION PL

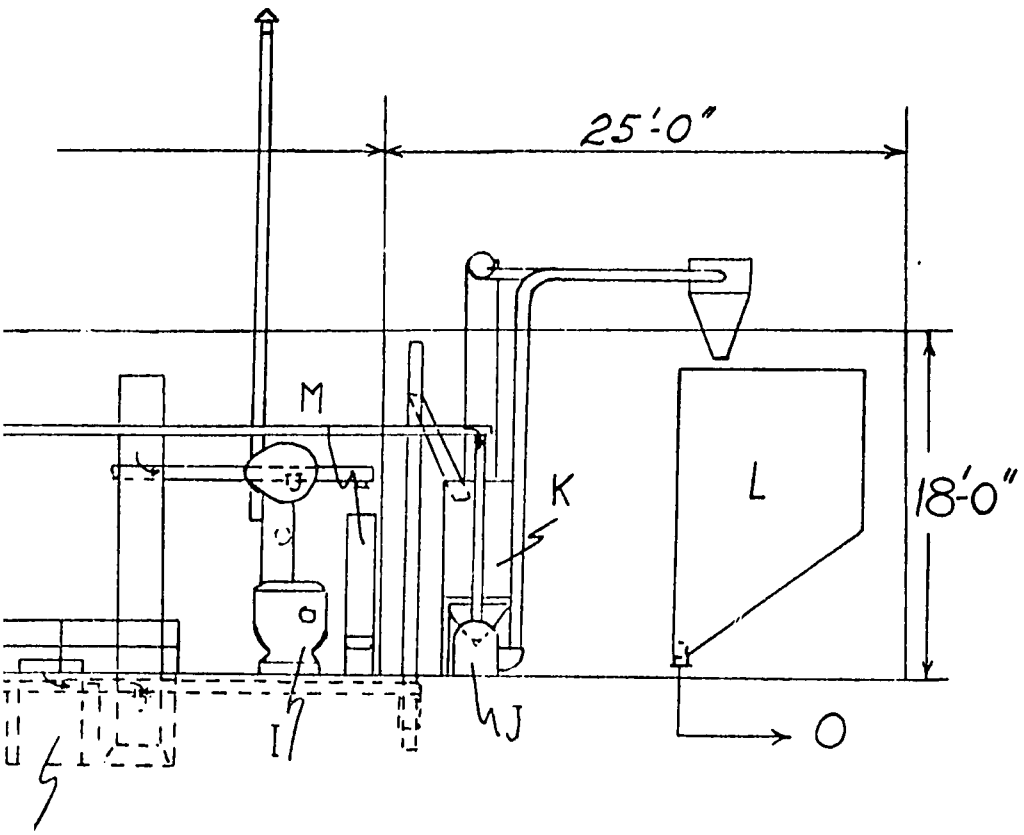


KEY

A. Days Run Bin
B. Batching Scale
C. Magnetic Cleaner
D. Screening Cleaner
E. Cooker-Dryer
F. Pressed Oil Tanks
G. Pressed Oil Filter Pre
H. Oil Screening Tank

MEAL

I. P. NO. 67269
S.I.C. 2093



I. Expeller
J. Hull & Cake Grinder
K. Press-Cake Cooler
L. Meal Bin
M. Overflow Bin
N. to Oil Storage
O. to Bagging & Storage
P. Huller & Aspirator

I.P. No. 67269
S.I.C. 2093

CASTOR OIL AND MEAL

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. The Essential Oils. Ernest Guenther. In six volumes, $90.00 the set. Volume I - Origin and Development of the Essential Oil Industry. 1949. 458 pp $13.50
Volume II - Constituents of Essential Oils. 1949. 868 pp. $17.50
Volume III, IV, V and VI deal with the essential oils of the various plant families.

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

B. Bailey's Industrial Oil and Fat Products. 3rd Edition. Edited by Daniel Swern. 1964. 1103 pp. $25.00

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

C. Federal Food, Drug, and Cosmetic Act, as amended. General Regulations for its Enforcement, Title 21, Part 1. $3.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

II. TECHNICAL AND TRADE PERIODICALS

A. Oil, Paint and Drug Reporter. Weekly. $7.00/year.

Schnell Publishing Company, Inc.
100 Church Street
New York, New York 10007

Current reporting on prices of chemicals and allied materials.

B. Journal of the American Oil Chemists' Society. Monthly. $12.00/year.

American Oil Chemists' Society
35 East Wacker Drive
Chicago, Illinois 60601

III. BUSINESS MANAGEMENT MATERIALS

B. The First Two years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,255,220 June 7, 1966 8 p.
Pre-treatment of oliaginous plant materials.

B. Patent No. 3,189,987 August 10, 1965 4 p.
Process for rendering fatty materials.

C. Patent No, 3,131,202 April 28,1964 13 p.
Process and apparatus for the continuous extraction of oils and soluble substances from solid materials.

D. Patent No, 3,099,649 July 30, 1963 3 p.
Process for refining of vegetable protein.

E. Patent No. 3,083,365 March 26, 1963 3 p.
Process of removing oils from seeds, etc., meats of nuts, beans, etc.

F. Patent No. 2,615,905 October 28, 1952 4 p.
Recovering valuable components from oil bearing seeds.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. International Castor Oil Association
216 Montclair Avenue
Upper Montclair, New Jersey 07043

B. Essential Oil Association
2 Lexington Avenue
New York, New York 10010

VI. DIRECTORIES

No directories available which are devoted exclusively to the castor oil industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

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GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

LAWN FURNITURE

I. P. No. 67270
S. I. C. 2511

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67270
S. I. C. 2511
DECEMBER 1967

LAWN FURNITURE

PRODUCT DESCRIPTION

Wooden lawn furniture including chairs, settees, tables and benches. The chairs and the settees have wooden seats and backs.

A. GENERAL EVALUATION OF PROSPECTS

These products are intended for use by families in the middle and upper income brackets. They might also be used as house furniture by families in the low income bracket. The capital requirements are fairly moderate and only two skilled workers are needed. The prospects for this industry depend on two factors: (1) the local availability of suitable lumber at reasonable price; and (2) an adequate local market for the products. A comprehensive study of these and other factors should be made to determine actual local conditions.

B. MARKET ASPECTS

1. USERS

These products would be used principally in homes as lawn and porch furniture. In some instances, they may be used in homes as house furnishings. They might also be used in parks, camps, at sea shores and other outdoor places and resort areas.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would usually be made direct to stores that sell furniture and to stores that sell camping equipment. The market for these items depends upon the family living habits of the country, the existence of parks, camps and other places where these items are used and on the per capita income of the population. These products can be produced on a very small scale with portable hand tools, especially if the lumber is purchased on a dimension lumber basis. Any good carpenter can make lawn furniture in a small shop. Domestic competition, therefore, might be very keen. Investigate the possibility of this kind of competition carefully. No competition can be expected from imported items. Lawns furniture is not an export item. The domestic sales of these products should be nationwide.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $260,000.
The total fixed investment, plus working capital, is estimated at $99,300.
The annual gross profit, before taxes, is estimated at $18,200.
Using these figures, the profit on gross sales, before taxes, amounts to 7%.
(A gross profit on sales, before taxes, of 7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 18.3%.

5. COST PER MAN EMPLOYED

Sixteen direct and five indirect workers, or a total of twenty-one workers, are employed.
The total fixed capital investment is estimated at $55,000.
Based on these figures, the fixed investment per man employed would amount to about $2,620.

C. PRODUCTION REQUIREMENTS LAWN FURNITURE

ANNUAL CAPACITY - ONE SHIFT OPERATION : 6,000 EACH OF CHAIRS, SETTEES, AND TABLES, AND 12,000 BENCHES

I.P. No. 67270
S.I.C. 2511

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 2 acre	
Building - one story 60' x 80'	
May use local materials	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 55,000

Principal Items :

Radial Arm Saw, Planer, Rip Saw with Power Feed Attachment, Band Saw with Safety Equipment, Boring Machine, Trim Saw, Spray Booth, Air Compressor

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 44,300

c. Total Capital Requirements $ 99,300

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Lumber	540,000 bd ft.	
Hardware		
Paint		
Package lumber		
Total direct materials		$ 68,500

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,600

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
a. Electric Power - 50 H.P. connected load Fuel - Scrap wood used Water - Sanitation and fire protection	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 4,500

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	5	$ 34,000
b. Direct Labor		
Skilled workers	3	
Semi-skilled workers	5	
Unskilled workers	8	
Total direct labor	16	$ 71,800

c. Training Needs.

The manager should be fully experienced. He and the two skilled workers should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own Transport Equipment.

Truck

b. External Transport Facilities.

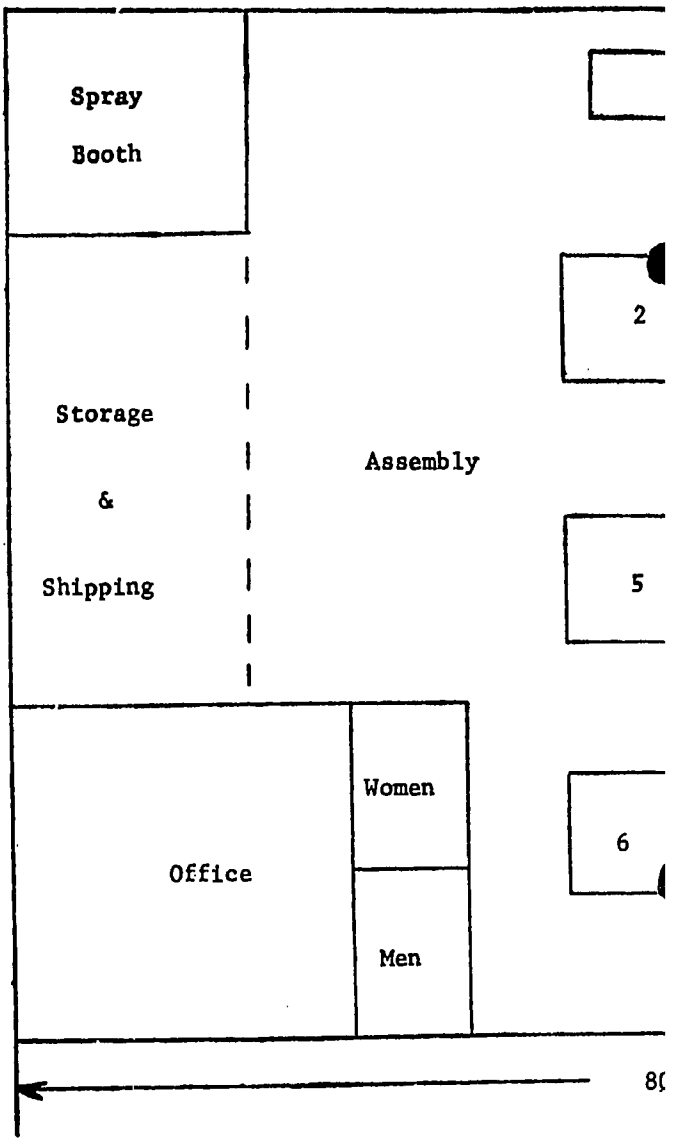
Product is bulky and heavy. Good highways essential. Railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 68,500	
Direct labor	71,800	
Manufacturing overhead*	44,400	
Total manufacturing cost		$184,700
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 21,100
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$241,800
Annual Gross Profit		$ 18,200
ANNUAL SALES REVENUE		$260,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect Labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

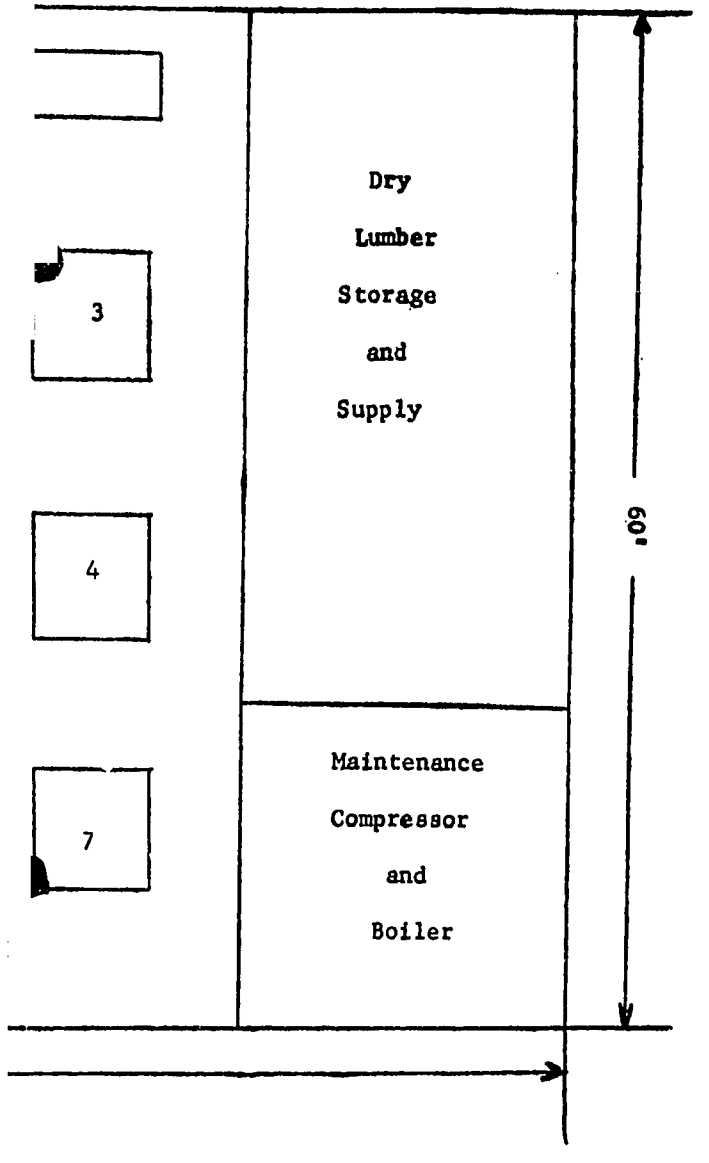


1. Radial saw
2. Planer
3. Shaper

FURNITURE

I.P. NO. 67270
S.I.C. 2511

T LAYOUT



5. Bandsaw
6. Boring
7. Trim saw

I. P. NO. 67270
S. I. C. 2511

LAWN FURNITURE

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener. 1966. 474 pp. 1550 Illus. $6.96

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equipment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp. 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete information on basic woodworking from raw materials through finished product.

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $ 5.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joints, workshop practice, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188

Devoted to coverage of industrial woodworking.

B. Casual Living and Casual Furniture. Monthly. $4.00/year.

Sidney S. Sirota, Publisher
456 Sylvan Avenue
Englewood Cliffs, New Jersey 07632

Covers casual furniture field.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
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Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,188,693 Joint construction for furniture.	June 15, 1965	9 p.
B.	Patent No. 3,152,836 Chair construction.	October 13, 1964	5 p.
C.	Patent No. 3,131,970 Seat construction.	May 5, 1964	5 p.
D.	Patent No. 3,084,009 Frame for rattan furniture.	April 9, 1960	6 p.
E.	Patent No. 2,936,009 Method of making rattan furniture.	May 10, 1963	4 p.
F.	Patent No. 2,784,774 Wooden furniture units and process of marking the same.	March 12, 1957	5 p.
G.	Patent No. 2,717,815 Coffee table.	1955	3 p.
H.	Patent No. 2,386,739 Coffee table.	1945	3 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Summer and Casual Furniture Manufacturers Association
666 Lake Shore Drive
Chicago, Illinois 60611

B. Furniture Manufacturers Association
103 Pearl Street, N. W.
Grand Rapids, Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers and suppliers for the woodworking industries.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

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INDUSTRY PROFILES

REINFORCED CONCRETE CONSTRUCTION PRODUCTS

I. P. No. 67271
S. I. C. 3227

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I.P. No. 67271
S.I.C. 3227
DECEMBER 1967

REINFORCED CONCRETE CONSTRUCTION PRODUCTS

PRODUCT DESCRIPTION

Reinforced concrete lintels, cornices, sills, door and window frames and other construction parts.

A. GENERAL EVALUATION OF PROSPECTS

The use of these products will depend to a great extent on the architectural designs of the buildings and on the local materials available for construction purposes, including the cost of local materials as compared with the cost of using these products. Because of these variations, the total gross sales are given as annual capacity instead of in number of units.

B. MARKET ASPECTS

1. USERS

These products are used in the construction of buildings.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are usually made to construction contractors and to large companies doing their own construction work. The market for these products cannot be based on population. It depends, instead, on the raw materials available and on the design of new buildings in the larger cities within the country. A survey should be made to determine the future construction potential and the materials available for such construction as well as the proposed designs of new buildings. Since these products are for the construction of modern buildings in the cities, they would not be used to any great extent in interior areas. Because of the size and weight of these products as compared with their selling prices, they are seldom exported. In the United States, where wages are high, the use of reinforced concrete units such as these has reduced construction costs. However, in some countries where wages are very much lower and buildings of a type less modern than those in the U.S., competition in the construction product field might be very keen.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $440,000.
The total fixed investment, plus working capital, is estimated at $265,700.
The annual gross profit, before taxes, is estimated at $43,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.8%.
(A gross profit on sales, before taxes, of 9.8%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 16.2%.

5. COST PER MAN EMPLOYED

Thirty direct and eight indirect workers, or a total of thirty-eight workers, are employed.
The total fixed capital investment is estimated at $183,000.
Based on these figures, the fixed investment per man employed would amount to about $4,815.

C. PRODUCTION REQUIREMENTS — REINFORCED CONCRETE CONSTRUCTION PRODUCTS — I. P. No. 67271 S.I.C. 3227

ANNUAL CAPACITY - ONE SHIFT OPERATION: 489,000 GROSS SALES

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - about 2 acres	
Building - one story 70'x200'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 183,000

Principal items:

3 Mixing Machines with Motor, 10 Felt Tables with Clamp, 10 Vibrating Hammers, 1000 Pallets, 3 Wheel Barrows, 3 Concrete Buggies, 1 Acetylene Welding Equipment, 1 Cutoff Saw, 1 Table Saw, 1 Hand Jointer, 1 Bench Sander, 1 Fork-Lift Truck, 1 Delivery Truck

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 82,700

c. Total Capital Requirements $ 265,700

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Portland cement	2,332 tons	
Coarse aggregate	7,200 tons	
Sand	4,800 tons	
Reinforcing pods and fittings		
Pattern wood		
Total direct materials		$ 91,200

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 5,400

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 80,000 KWH connected load	
Fuel - Heating as required	
Water - Production, sanitation, and fire protection	$ 2,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 15,000

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager and Foreman	2	
Office Receiving & Shipping	3	
Maintenance	1	
Truck Driver	2	
Total indirect labor	8	$ 51,000
b. Direct labor		
Skilled workers	12	
Semi-skilled workers	14	
Unskilled workers	4	
Total direct labor	30	$ 158,000

c. Training Needs

The manager and foreman with three skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments are 96 tons per day. Plant should be on or near a railroad.

7. TOTAL ANNUAL COSTS AND SALES

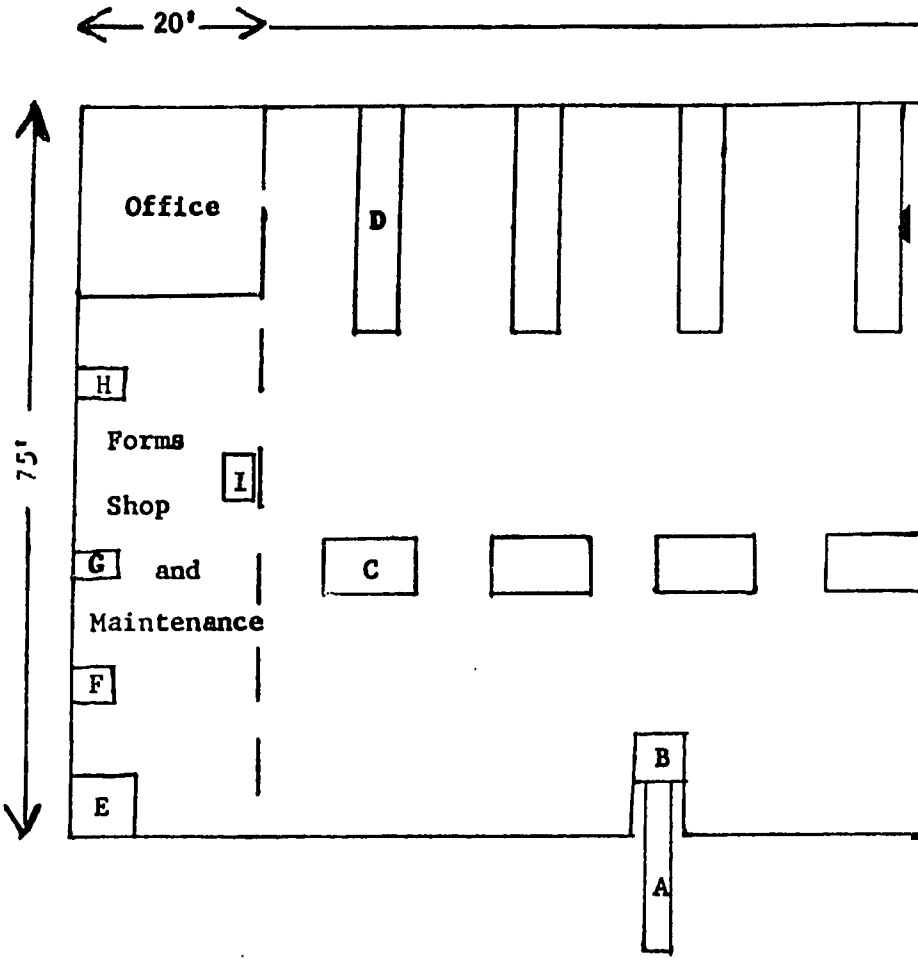
REVENUE		
Direct materials	$ 91,200	
Direct labor	158,000	
Manufacturing overhead*	74,100	
Total manufacturing cost		$ 323,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 43,700
Sales expense		18,000
Freight-out, travel discounts		
Allowances & bad debts		$ 12,000
Total annual costs		$ 397,000
Annual Gross Profit		$ 43,000
ANNUAL SALES REVENUE		$ 440,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

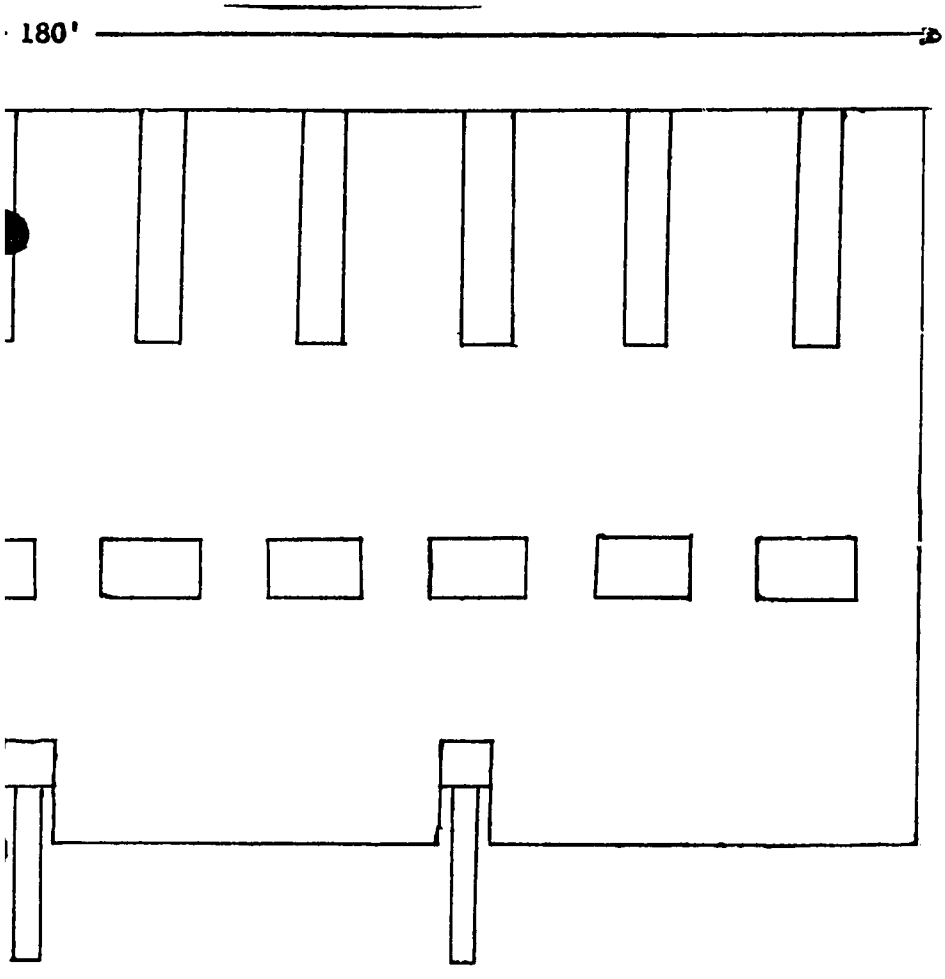
REINFORCED CONCRETE C

PLANT



A - 3 Ramps to Concrete M
B - 3 Concrete Mixers
C - 10 Tilt Tables
D - 10 Skids for Fence Posts

T



E - 1 Air Compressor
F - 1 Jointer
G - 1 Trim and Rip Saw
H - 1 Cut-off Saw
I - 1 Sander

I.P. No. 67271
S.I.C. 3227

REINFORCED CONCRETE CONSTRUCTION PRODUCTS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Compositions and Properties of Concrete. Troxell and Davis. 1956. 434 pp. Illus. $9.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Principles of concrete making. The nature of the problems. Concrete making materials. Proportioning of concrete mixes.

B. Reinforced Concrete. J. Faber and F. Mead. 2nd Edition. 1961. Illus. $14.75

D. Van Nostrand & Company
120 Alexander Street
Princeton, New Jersey 08540

C. Simplified Designs of Reinforced Concrete. Harry Parker. 2nd Edition. 1960. 303 pp. Illus. $6.50

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Provides basic, practical information in the field of mechanics and strength of material without the use of advanced mathematics.

D. Design and Control of Concrete Mixtures.

Portland Cement Association
33 West Grand Avenue
Chicago, Illinois 60610

II. TECHNICAL AND TRADE PERIODICALS

A. Modern Concrete. Monthly. $2.00/year

Pit and Quarry Publications, Inc.
431 South Dearborn Street
Chicago, Illinois 60605

Devoted to the concrete industry.

B. Concrete Products. Monthly. $4.00/year

MacLean-Hunter Publishing Corporation
300 West Adams Street
Chicago, Illinois 60606

Deals with progress and development in the concrete industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U.S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,242,242. March 1966. 4 p.
Method for the production of decorative wall and flooring tile.

B. Patent No. 3,217,075. November 1965. 5 p.
Method for making stressed light weight concrete products.

C. Patent No. 3,089,215. May 1963. 7 p.
Method and apparatus for the continuous production of prestressed concrete.

D. Patent No. 3,058,164. October 1962. 5 p.
Method of making artificial stone for decorative covering.

E. Patent No. 3,055,073. September 1962. 4 p.
Method and apparatus for the continuous production of prestressed concrete members.

F. Patent No. 2,819,495. January 1958. 6 p.
Method of making decorative building blocks.

G. Patent No. 2,700,800. February 1955. 3 p.
Method and apparatus for making faced concrete block.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Precast Concrete Association
Box 109
Waverly, Ohio 45609

B. Portland Cement Association
33 West Grand Avenue
Chicago, Illinois 60610

VI. DIRECTORIES

A. American Concrete Industry Directory. $5.00.

American Concrete Institute
P.O. Box 4754
Redford Station
Detroit, Michigan 48219

Lists 18,588 engineers, architects, scientists, builders, manufacturers and representatives of industries in the field of concrete. This association also publishes a monthly journal.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

CHURCH FURNITURE

I. P. No. 67272
S. I. C. 2531

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67272
S.I.C. 2531
DECEMBER 1967

CHURCH FURNITURE

PRODUCT DESCRIPTION

Wooden church pews designed in accordance with requirements of each church. Since these pews are made in many different styles--some curved, some straight, some very short and some very long--it is not practical to establish a price per unit. For this reason, under the annual capacity, gross sales of $300,000 is shown instead of a unit price.

A. GENERAL EVALUATION OF PROSPECTS

The capital requirements of this industry are moderate compared with the gross sales and the fact that only four skilled workers are required. While this plant is designed to make church furniture, many other items of furniture could be produced if the sales volume for church furniture alone proved inadequate.

B. MARKET ASPECTS

1. USERS

Churches of all denominations.

2. SALES CHANNELS AND EXTENT OF MARKET

Church furniture is usually sold direct to each church. The plant's success depends upon the renewing of furniture in old churches and the construction of new churches. There is no known method of determining market potential by population or income level. If the volume of church furniture production is inadequate to keep the plant busy, it would be necessary to enter into the production of other wood items. Although church pews are bulky when crated, they are usually shipped nationwide, if transportation facilities permit. Most church furniture is usually designed especially for a particular church and requires a considerable amount of machinery. Competition would come from other woodworking industries. Church furniture is not generally sold in international trade and no competition can be expected from imported products.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $300,000.
The total fixed investment, plus working capital, is estimated at $162,800.
The annual gross profit, before taxes, is estimated at $24,000.
Using these figures, the profit on gross sales, before taxes, amounts to 8%.
(A gross profit on sales, before taxes, of 8%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 14.7%.

5. COST PER MAN EMPLOYED

Eighteen direct and six indirect workers, or a total of twenty-four workers are employed.
The total fixed capital investment is estimated at $111,000.
Based on these figures, the fixed investment per man employed would amount to $4,625.

I. P. No. 67272
S. I. C. 2531

C. PRODUCTION REQUIREMENTS CHURCH FURNITURE

ANNUAL CAPACITY - ONE SHIFT OPERATION: GROSS SALES $300,000

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. FIXED CAPITAL	Cost
Land - 1 acre	
Building - 80' x 100'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 111,000

Principal items:

Radial Saw, Rip Saw, Jointer, Planer, Band Saw, Trim Saw, Shaper, Horizontal Boring Machine, Upright Boring Machine, Tenon, Chair Mortiser, Chair Mortiser Grinder, Saw Filer, knife Grinder, Glue Reel, Tongue and Groover, 2 Table Sanders, Drum Sander, Assembly Presses, Spray Booth

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 51,800
c. Total Capital Requirements	$ 162,800

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Lumber, dried	500,000 board feet	
Wood screws and nails		
Lacquer		
Crating		
Total direct materials		$ 68,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,600

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 90 H. P. connected load Fuel - Shop wood used Water - Sanitation and fire protection	$ 4,100

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,500

5. MANPOWER

	Number	Annual Cost
a Indirect labor		
Manager	1	
Foreman	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct Labor		
Skilled workers	4	
Semi-skilled workers	8	
Unskilled workers	6	
Total direct labor	18	$ 85,600

c. Training needs

The manager with the foreman and two skilled workers should be able to train all workers and reach full production in three weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Good highways, railroad if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 68,000	
Direct labor	85,600	
Manufacturing overhead*	63,200	
Total manufacturing cost		$216,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 23,200
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$276,000
Annual Gross Profit		$ 24,000
ANNUAL SALES REVENUE		$300,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

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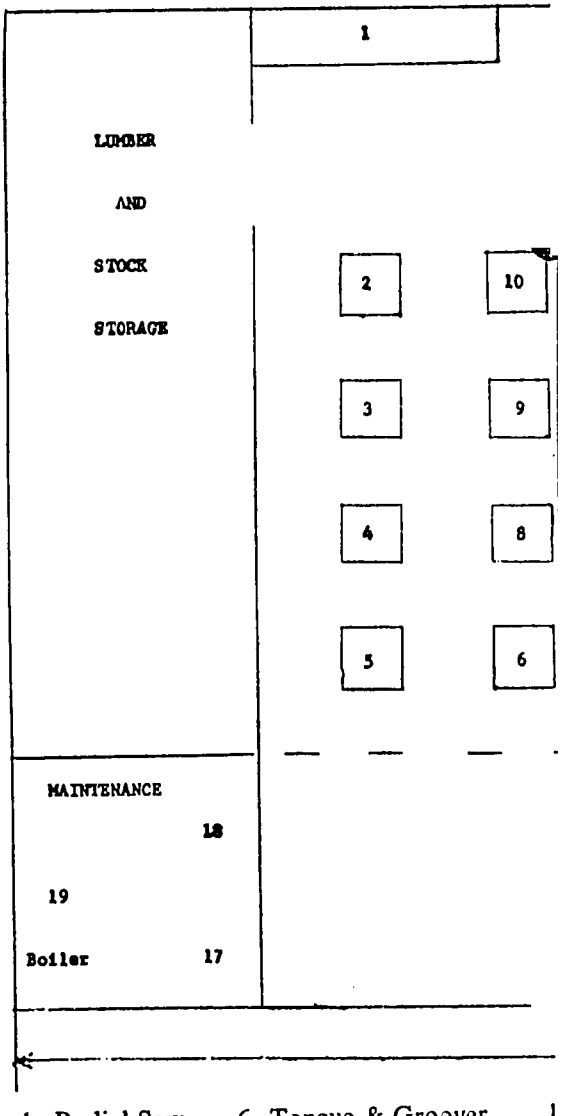

1. Radial Saw
2. Planer
3. Jointer
4. Rip Saw
5. Trim Saw
6. Tongue & Groover
7. Glue Reel
8. Bandsaw
9. Shaper
10. Tenon

NITURE

I. P. NO. 67272
S.I.C. 2531

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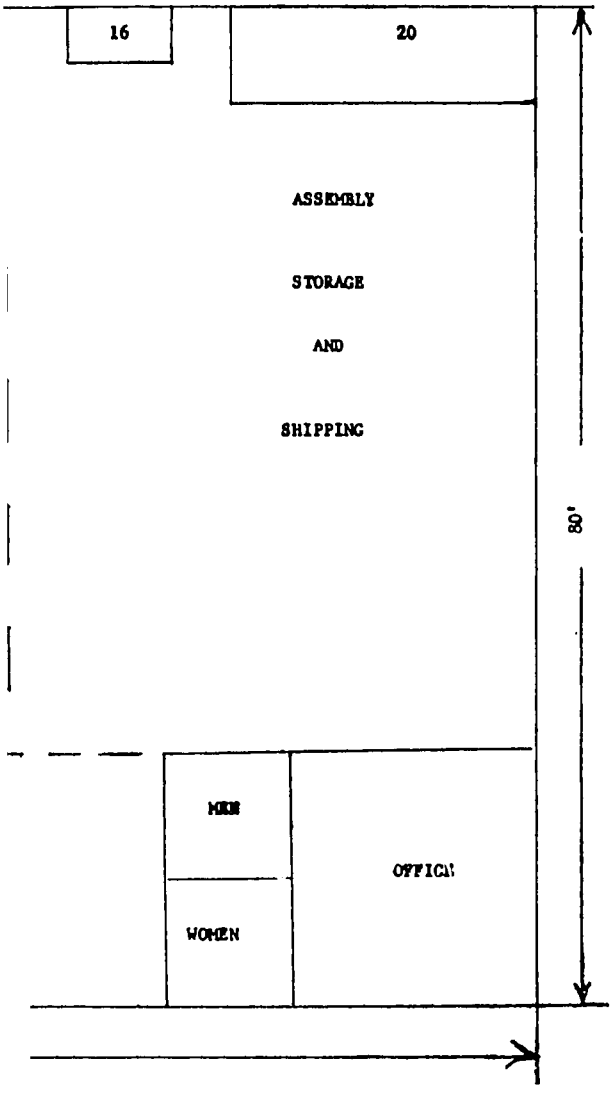

Boring
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16. Table Sander
17. Chain Mortiser Grinder
18. Knife Grinder
19. Bandsaw File
20. Spray Booth

I.P. No. 67272
S.I.C. 2531

CHURCH FURNITURE

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener. 1966. 474 pp. 1550 Illus. $6.96

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equipment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp. 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete imformation on basic woodworking from raw materials through finished product.

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $5.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joints, workshop practice, drawers, bookcases, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188

Devoted to coverage of industrial woodworking.

B. Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes, marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
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How to move materials through the shop economically and efficiently.

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IV. REPRESENTATIVE U.S. PATENTS

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A. Patent No. 3,254,931 June 7, 1966 4 p.
Book compartment construction for chapel pews and the like.

B. Patent No. 3,120,410 February 4, 1964 3 p.
Prayer cabinets.

C. Patent No. 3,074,757 January 22, 1963 4 p.
Folding pews.

D. Patent No. 2,598,128 May 27, 1952 4 p.
Speakers stand.

E. Patent No. 2,536,450 January 2, 1951 6 p.
Foldable prayer rail.

F. Patent No. 2,536,449 January 2, 1951 5 p.
Folding prayer rail.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A Church Furniture Manufacturers Association
666 Lake Shore Drive
Chicago, Illinois 60611

B. Furniture Manufacturers Association
103 Pearl Street, N. W.
Grand Rapids, Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers of woodworking machinery and equipment.

VII. PROFESSIONAL ENGINEERING SERVICES

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INDUSTRY PROFILES

GLOVES, VINYL TREATED FABRIC

I. P. No. 67273
S. I. C. 2381

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I. P. NO. 67273
S.I.C. 2381
DECEMBER 1967

GLOVES, VINYL TREATED FABRIC

PRODUCT DESCRIPTION

Machine-sewn work gloves made from vinyl treated fabric.

A. GENERAL EVALUATION OF PROSPECTS

These gloves are more expensive than common canvas gloves or plastic-faced gloves. The investment in fixed capital required for the manufacture of 400,000 pairs is very small. Variation in output can be achieved easily by varying the number of sewing machines employed. The amount of skilled labor required is small. The raw materials are readily available or obtainable. Many of the new developing countries should be able to support a plant of this kind.

B. MARKET ASPECTS

1. USERS

Workmen, all activities where work gloves are required.

2. SALES CHANNELS AND EXTENT OF MARKET

This plant would sell to wholesalers and direct to large retail stores. Direct sales to large organizations, such as railroads or mines, may be possible. This product is light and easily transported so nationwide distribution should be possible. Work gloves are commonly exported worldwide and competition from imported items is likely to be keen. Hand-sewn gloves, as well as gloves made of other materials, may also present keen competition. A plant of this size would normally not be able to compete in international trade.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United State of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 280,000.
The total fixed investment, plus working capital, is estimated at $ 74,400.
The annual gross profit, before taxes, is estimated at $ 22,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.9%.
(A gross profit on sales, before taxes, of 7.9%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 29.5%.

5. COST PER MAN EMPLOYED

Thirteen direct workers and four indirect workers, or a total of seventeen workers, are employed.
The total fixed capital investment is estimated at $ 27,000.
Based on these figures, the fixed investment per man employed would amount to about $ 1,588.

I. P. NO. 67273
S.I.C. 2381

C. PRODUCTION REQUIREMENTS GLOVES VINYL TREATED FABRIC

ANNUAL CAPACITY - ONE SHIFT OPERATION: 400,000 PAIR
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 5,000 sq. ft.	
Building - one story 30' x 70'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 27,000

Principal items:
Cloth Spreader
Electric Drill
Cutting Table
Electric Cutter
10 Sewing Machines
Work Tables and Chairs
Clicker Machines and Dies

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 47,400
c. Total Capital Requirements	$ 74,400

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Vinyl treated fabric	110,000 yds.	
Packaging		
Total direct materials		$ 105,500

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 2,200

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

Electric Power - 5 H.P. connected load Fuel - Heating as required Water - Sanitation and fire protection	Annual Cost $ 875

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 2,625

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Office	1	
Machine fixed	1	
Truck Driver	1	
Total indirect labor	4	$ 31,000

b. Direct labor		
Skilled workers	1	
Semi-skilled workers	10	
Unskilled workers	2	
Total direct labor	13	$ 63,200

c. Training needs

The manager and one skilled worker should be able to train all workers and reach full production in a little over two weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck.

b. External transport facilities

Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 105,500	
Direct labor	63,200	
Manufacturing overhead*	36,700	
Total manufacturing cost		$ 205,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 28,600
Sales expense		$ 18,000
Freight-out, travel discounts Allowances & bad debts		$ 6,000
Total annual costs		$ 258,000
Annual Gross Profit		$ 22,000
ANNUAL SALES REVENUE		$ 280,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

GLOVES, VI

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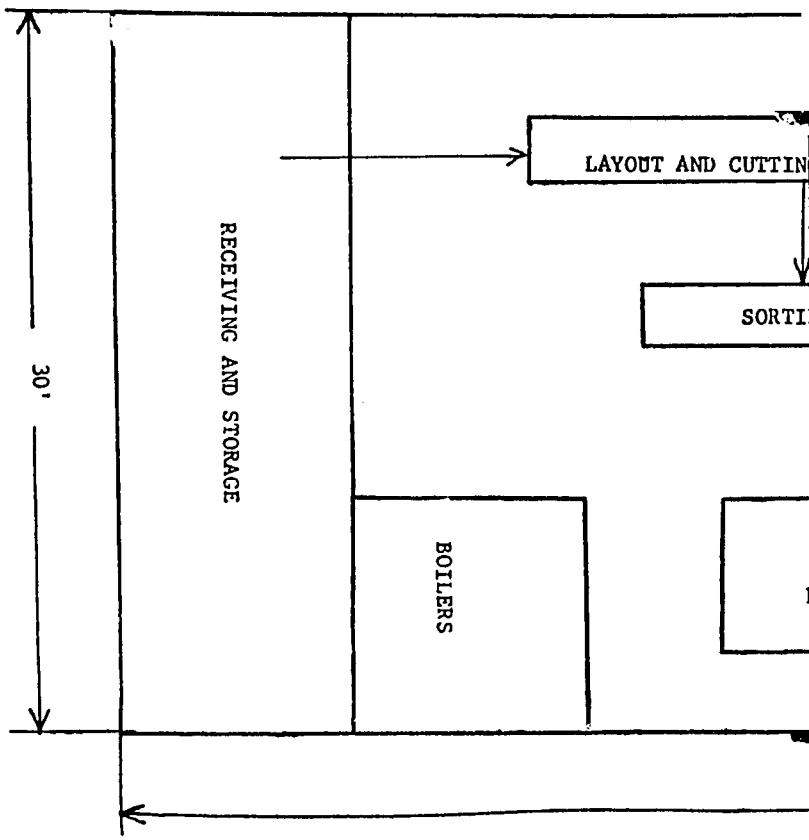
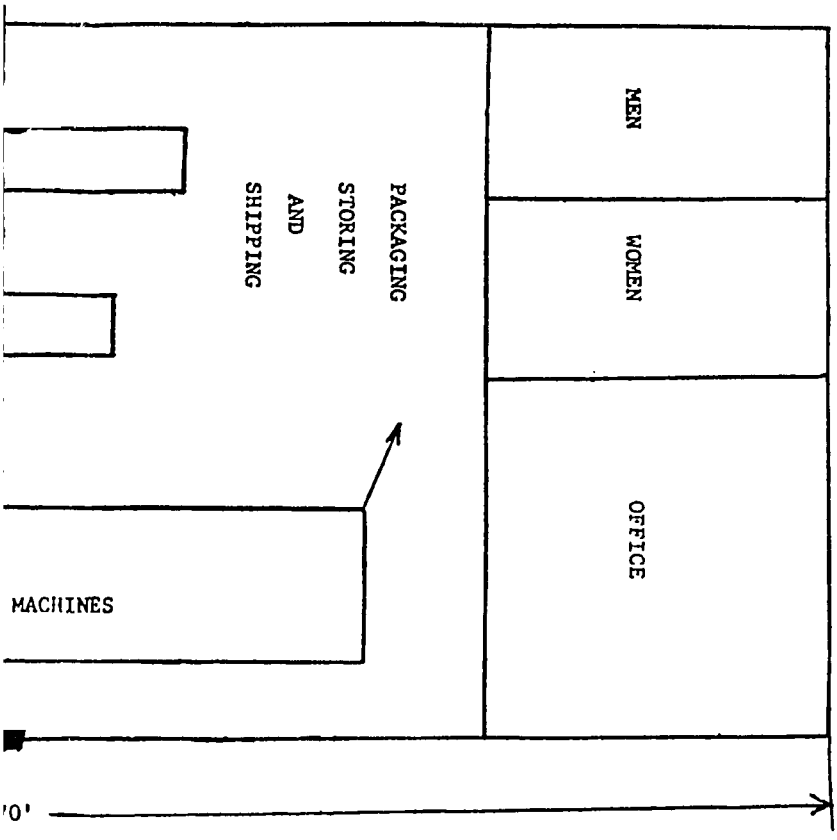


ATED FABRIC

I. P. NO. 67273
S.I.C. 2381

OUT

WORK FLOW



I. P. NO. 67273
S.I.C. 2381

GLOVES, VINYL TREATED FABRIC

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Plant Production Control. 3rd Edition. C. A. Koepke. 1961. 509 pp. Illus. $8.95

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

All phases of production control from product design and specifications to dispatching of finished product.

B. Apparel Manufacturing Analysis. Jacob Solinger. 1961. 800 pp. Illus. $22.50

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

Devoted to the machines and operations required to produce cloth products.

C. The Art of Glove Making. $1.00

National Association of Glove Manufacturers
52 South Main Street
Gloversville, New York 12078

II. TECHNICAL AND TRADE PERIODICALS

A. Textile World. Monthly. $2.00/year

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Technical journal devoted to production of textile products, operations, equipment, and management.

B. Textile Research Journal. Monthly. $25.00/year

Textile Research Institute
Box 625
Princeton, New Jersey 08540

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20.

Small Business management Series No. 4
U.S. Government Printing Office
Washington, D.C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,251,067 Glove having a novel thumb construction.	May 1966	9 p.
B.	Patent No. 3,221,344 Work gloves with special safety construction.	December 7, 1965	2 p.
C.	Patent No. 3,184,756 Workingman's protective glove.	May 25, 1965	5 p.
D.	Patent No. 3,164,841 Gloves worn to protect hands which engage in work.	January 12, 1965	2 p.
E.	Patent No. 3,063,057 Reversible work glove.	November 13, 1962	3 p.
F.	Patent No. 2,923,946 Safety glove.	1960	2 p.
G.	Patent No. 2,864,091 Reinforced work glove.	December 16, 1958	4 p.
H.	Patent No. 2,862,208 Protective work gloves.	July 1958	2 p.
I.	Patent No. 2,849,786 Industrial protective clothing.	September 1958	5 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Work Glove Institute
176 West Adams Street
Chicago, Illinois 60603

B. National Association of Glove Manufacturers
52 South Main Street,
Gloversville, New York 12078

VI. DIRECTORIES

A. Gloves Directory, Annual. $1.00

Haire Publishing Company
111 - 4th Avenue
New York, New York 10003

1,000 glove manufacturers and suppliers.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

RADIO RECEIVING SETS

I. P. No. 67274
S. I. C. 3651

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utili[illegible], manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. NO. 67274
S.I.C. 3651
DECEMBER 1967

RADIO RECEIVING SETS

PRODUCT DESCRIPTION

Five-tube superheterodyne table model radios, assembled from purchased components. Size about 5" x 5" by 9", weight about 5 pounds. Production, cost and capacity data are based on manufacture of simple but sturdy and high quality unit. Plant and facilities can, however, make more elaborate models and many other kinds of electronic equipment.

A. GENERAL EVALUATION OF PROSPECTS

The capital needed for this plant is moderately high. Labor skill requirements are low. If there is a flourishing domestic market for radios, a plant such as that described might be a profitable operation. However, since this is a highly competitive business internationally, a very thorough examination of the comparative cost of the domestic product and that of imported completely assembled radios needs to be made before any investment is made in such a plant.

B. MARKET ASPECTS

1. USERS

Households, factories, eating places, stores, government departments.

2. SALES CHANNELS AND EXTENT OF MARKET

Radios need careful packing and handling. Unit value is high enough to permit transport over long distances where sales can be made to retail establishments. A few sales will be made to wholesalers and also to large users. A distinctive brand name is desirable. In a country of moderate size, national distribution should be attempted. Demand for radios will depend on the extent of local broadcasting facilities and the general income level. competition from imported radios will be keen and economical operation is necessary to compete effectively. Television sets compete with radios in the higher income countries but as yet do not seriously compete with radios in the developed countries. Transistor model radios are another form of competition. This plant could not compete in international markets with the large-scale manufacturers from advanced industrial countries.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $700,000.
The total fixed investment, plus working capital, is estimated at $240,700.
The annual gross profit, before taxes, is estimated at $68,000.
Using these figures, the profit on gross sales, before taxes, amounts to 9.7%.
(A gross profit on sales, before taxes, of 9.7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 28.3%.

5. COST PER MAN EMPLOYED

Thirty-one direct and five indirect workers, or a total of thirty-six workers, are employed.
The total fixed capital investment is estimated at $ 46,000.
Based on these figures, the fixed investment per man employed would amount to about $1,280.

C. PRODUCTION REQUIREMENTS RADIO RECEIVING SETS
ANNUAL CAPACITY - ONE SHIFT OPERATION : 25,000 RADIOS
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

I.P. No. 67274
S.I.C. 3651

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - about 15,000 sq. ft.	
Building - one story 40' x 100'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 46,000

Principal items:
2 Belt Conveyors, 2 Hydraulic Lift-Trucks, Woodworking Equipment, Testing Instruments, Fixtures, Forms and Dies, Vises, Bench Tools, Soldering Equipment, Coil Winder, Skids, Eyelet Machines (3), Bench Grinder, Power Hack Saw, Punch Press, Band Saw, Drill Press, Electric Drill, Bender, Hand Tools, 1-ton Truck

b. Working Capital (30 to 60 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 194,700

c. Total Capital Requirements $ 240,700

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Resistors	175,000 pcs.	
Condensers	225,000 pcs.	
Hardware, screws, nuts, spacers	1,150,000	
Transformers	125,000 pcs.	
Cabinets	25,000 pcs.	
Cartons	25,000 pcs.	
Tubes (amplifiers)	125,000 pcs.	
Chassis	25,000 pcs.	
Dial assembly	25,000 sets	
Switches	25,000 pcs.	
Hookup wire		
Total direct materials		$ 390,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 8,700

c. Availability of materials & supplies
In most newly developing countries the bulk of the materials will need to be imported. All materials and supplies are normally readily available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 60 H.P. connected load	
Fuel - Heat as required	
Water - Sanitation and fire protection	
	$ 1,400

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 3,900

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	4	
Unskilled workers	25	
Total direct labor	31	$ 122,000

c. Training Needs
The operations are mostly assembly work. The manager and supervisor should have years of experience. They, with two skilled workers, should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment
Truck

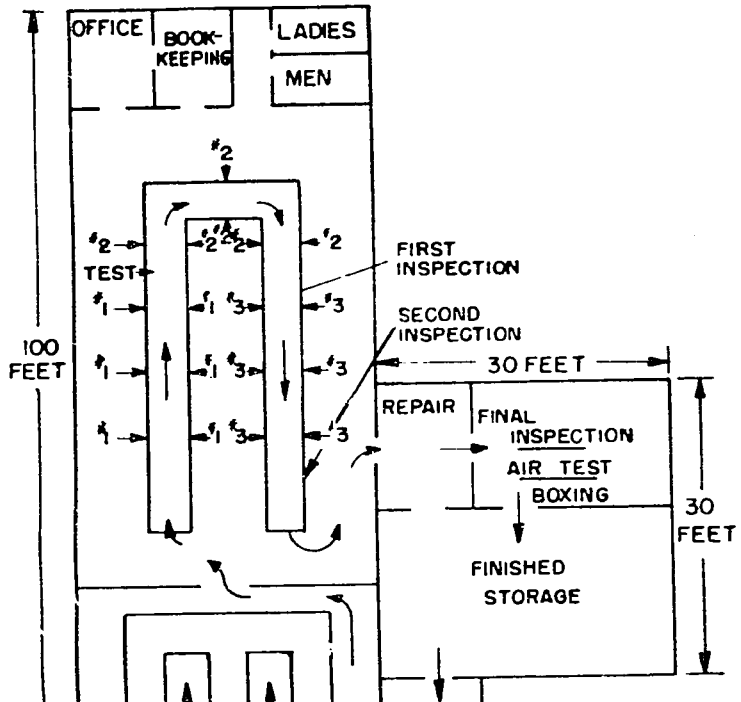
b. External transport facilities
Good highways are essential.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

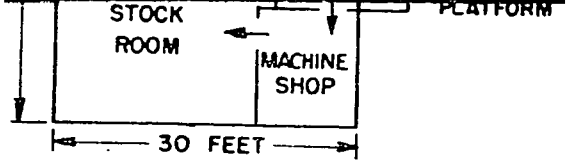
Direct materials	$ 390,000	
Direct labor	122,000	
Manufacturing overhead*	51,000	
Total manufacturing cost		$ 563,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 25,000
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 20,000
Total annual costs		$ 632,000
Annual Gross Profit		$ 68,000
ANNUAL SALES REVENUE		$ 700,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYOUT



RADIO RECEIVIN



FLOW SHEET

A. Incoming inspection to stock room.
B. Stock room to shop.

Shop operation
- B. 1. Rivet receptacles to chassis
- B. 2. Mount other parts
- B. 3. Cut, strip and bend wires
- B. 4. Return to stock room

C. Stock room to sub-assembly.

Sub-assembly operations
Through stage 1, stage 2, stage 3

D. Sub-assembly stage 3 to assembly.
E. Wires to assembly.

Green wires to step 1, red wires to step 2, black wires to step 3

F. Soldering. Step 1, green wires.
G. Test power circuit.
H. Soldering. Step 2, red wires.
I. Test audio circuit.
J. Soldering. Step 3, black wires.
K. Final inspection and air testing (in repair room).
L. Repair and return to final inspection.
M. To carton.
N. To finished stock.
O. Shipping.

I. P. NO. 67274
S. I. C. 3651

I. P. NO. 67274
S. I. C. 3651

RADIO RECEIVING SETS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Principles of Radio, E. Henney and G. A. Richardson. 7th Edition. 655 pp. Illus.

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Gives the principles of radio, with emphasis on the operation of basic radio circuits.

B. Radio Engineers' Handbook. F. E. Terman. Illus. 1943. $16.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

C. Radio Engineering Handbook. K. Henney. 5th Edition. 1959. $25.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

II. TECHNICAL AND TRADE PERIODICALS

A. Proceedings of the Institute of Electrical and Electronics Engineers. Monthly. $6.00/year

Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, New York 10017

Technical publication dealing with radio engineering.

B. Electronic Design. Bi-weekly. Controlled free distribution

Hayden Publishing Company, Inc.
850 Third Avenue
New York, New York 10022

Magazine intended to keep subscribers informed on the current advancements in the field of electronic design engineering.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
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Prepared by Small Business Administration to assist in the development of management in small business.

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IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,258,695. Radio receivers incorporating reflex amplifier circuits.	June 28, 1966.	3 p.
B.	Patent No. 3,244,982. Receiving apparatus including both tubes and transistors.	April 5, 1966.	4 p.
C.	Patent No. 2,243,709. All transistor radio receiver.	March 29, 1966.	4 p.
D.	Patent No. 3,234,466. Transistorized radio receiver.	February 8, 1966.	4 p.
E.	Patent No. 3,234,469. Frequency modulation radio receiver.	February 8, 1966.	3 p.
F.	Patent No. 3,193,767. Transistor radio signal receiver.	July 6, 1965.	8 p.
G.	Patent No. 3,181,066. Transistorized superhetrodyne receiver.	April 27, 1965.	3 p.
H.	Patent No. 3,071,728. Portable auto radio receiver.	January 1, 1963.	7 p.
I.	Patent No. 2,991,359. Radio receiving arrangement.	1961.	2 p.
J.	Patent No. 2,810,071. Radio receiver.	1957.	13 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, New York 10017

B. Electronic Industries Association
1721 DeSales Street, N. W.
Washington, D. C. 20006

VI. DIRECTORIES

A. The Radio-Electronic Master. Annual. $10.00

United Catalog Publisher
645 Stewart Avenue
Garden City, New York

Lists manufacturers of 271 radio, television, and audio electronic parts and components.

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

BRIEF CASES, LEATHER

I. P. No. 67275
S. I. C. 3161

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I.P. NO. 67275
S.I.C. 3161
DECEMBER 1967

BRIEF CASES, LEATHER

PRODUCT DESCRIPTION

Brief cases made from split cowhide lined and closed with a zipper.

A. GENERAL EVALUATION OF PROSPECTS

The plant and equipment described in this profile are capable of producing all types of leather cases including brief cases, portfolios, under-arm cases, attache cases, companion cases, club bags and other items of this kind. It will also make the same articles from plastic and other materials. The cost and profit figures shown in this profile are based on the production of 50,000 under-arm brief cases made from split cowhide and lined. They are closed with a zipper. If the potential sales is equal to the output of this plant, the prospects for this industry should be good, particularly if tanned cowhides are available locally and need not be imported.

B. MARKET ASPECTS

1. USERS

Professional men, businessmen, salesmen, students and all who carry papers and books.

2. SALES CHANNELS AND EXTENT OF MARKET

This plant would sell to wholesalers for distribution to retailers and might make some sales direct to large retail stores. No estimate can be made of the market size required in terms of population. In rural areas, where per capita income in many countries is low, there would be little need for brief cases. These products will be used mainly in urban areas and, even there, the nature of business activities would affect the requirements. It is necessary, therefore, to make a comprehensive sales survey to determine the potential market for these items. The value of leather brief cases is high compared to their transport cost so distribution should be nationwide. Domestic competition can be expected from indivi-uals engaged in this business on a small scale, sometimes utilizing their families as workers. Brief cases made of cheaper materials may compete with leather goods and since these items are manufactured in small plants, or made completely by hand, competition could be strong. These products are traded widely internationally and, while this plant could not compete with mass-production plants, some sales might be made to neighboring countries.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 300,000.
The total fixed investment, plus working capital, is estimated at $ 73,000.
The annual gross profit, before taxes, is estimated at $ 33,000.
Using these figures, the profit on gross sales, before taxes, amounts to 11%.
(A gross profit on sales, before taxes, of 11%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 45.2%.

5. COST PER MAN EMPLOYED

Twelve direct workers and five indirect workers, or a total of seventeen workers, are employed.
The total fixed capital investment is estimated at $ 24,000.
Based on these figures, the fixed investment per man employed would amount to about $ 1,400.

C. PRODUCTION REQUIREMENTS BRIEF CASES, LEATHER — I.P. No. 67275
ANNUAL CAPACITY - ONE SHIFT OPERATION : 50,000 UNITS — S.I.C. 3161
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 5,000 sq. ft.	
Building - one story 40' x 50'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 24,000

Principal items :

Cutting Tables
Skiving Machine
6 Sewing Machines
Line Roller
Leather Splitter

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 49,000
c. Total Capital Requirements	$ 73,000

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Split cow hide	260,000 sq. ft.	
Lining		
Zippers		
Packaging		
Total direct materials		$ 115,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,000

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 6 H.P. connected load	
Fuel - Heat as required	
Water - sanitation and fire protection	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 2,300

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Foreman	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 34,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	6	
Unskilled workers	4	
Total direct labor	12	$ 56,400

c. Training needs

The manager, with the foreman and one skilled worker, should be able to train all workers and reach full production in three weeks.

6. TRANSPORTATION

a. Own Transport equipment

Truck

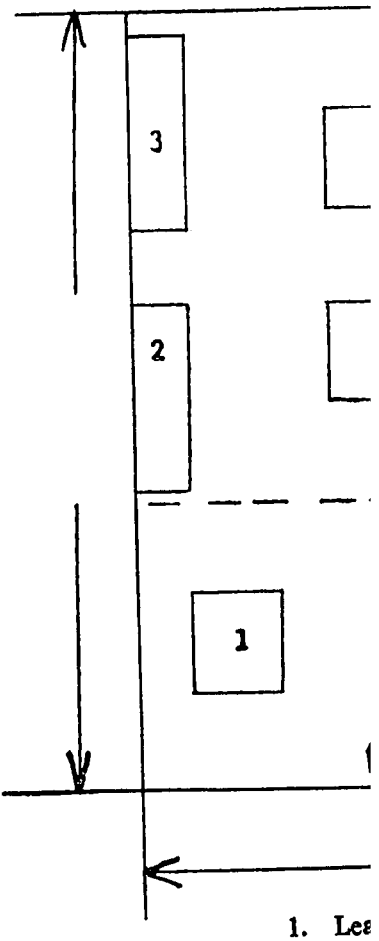
b. External transport facilities

Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

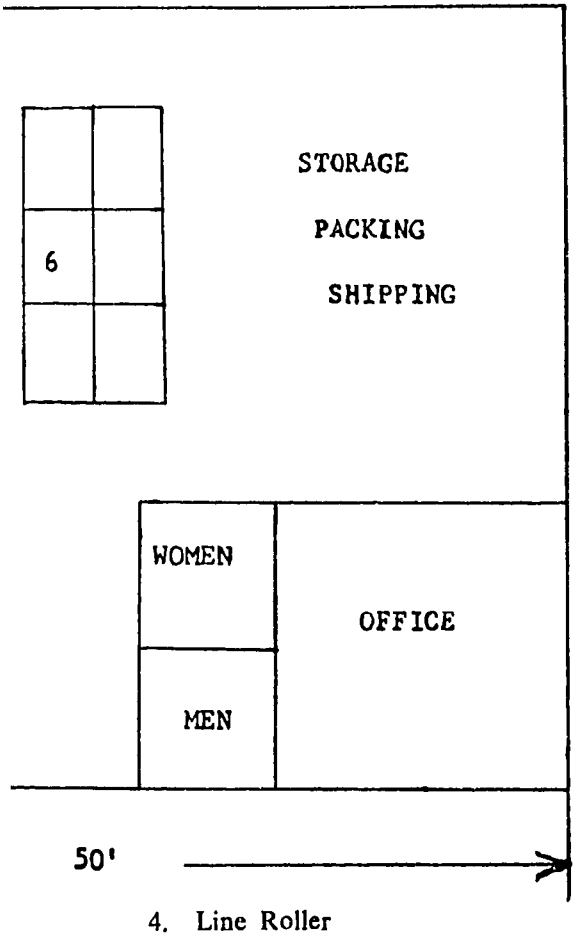
Direct materials	$ 115,000	
Direct labor	56,400	
Manufacturing overhead*	40,600	
Total manufacturing cost		$ 212,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 19,000
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 267,000
Annual Gross Profit		$ 33,000
ANNUAL SALES REVENUE		$ 300,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.



1. Lea
2. Cu
3. Cu

LAYOUT



4. Line Roller
5. Skiving Machine
6. Sewing Machines (6)

BRIEF CASES, LEATHER

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Leatherwork Procedure and Design. W. P. Klingensmith. 1958. 136 pp. Illus. $3.85

Bruce Publishing Company
400 North Broadway
Milwaukee, Wisconsin 53202

Preparation of leather and its utilization in the making of leather handbags and other such articles.

B. Leathercraft. Robert L. Thompson. $4.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

II. TECHNICAL AND TRADE PERIODICALS

A. Luggage and Leather Goods Monthly. $3.00/year

Haire Business Publications, Inc.
111 Fourth Avenue
New York, New York 10003

Production, processes, products, raw material, sources and costs and merchandising outlets.

B. Handbags and Accessories. Monthly. $3.00/year

Haire Business Publications, Inc.
111 Fourth Avenue
New York, New York 10003

Materials, manufacturing innovations, and products and market.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $ 1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,176,781. Brief cases.	April 6, 1965	2 p.
B.	Patent No. 3,120,252. Brief case construction.	February 4, 1964	4 p.
C.	Patent No. 3,021,883. Brief case construction.	February 20, 1962	3 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Leather Industries of America
411 Fifth Avenue
New York, New York 10016

Provides news and technical information to members.

B. Luggage and Leather Goods Manufacturers of America
220 Fifth Avenue
New York, New York 10001

VI. DIRECTORIES

A. Luggage and Leather Goods Directory. Annual. $1.00.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists 1,500 manufacturers of trunks, luggage, brief cases and personal leather goods in the United States.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

PRAWN PROCESSING PLANT

I. P. No. 67276
S. I. C. 2036

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67276
S.I.C. 2036
NOVEMBER 1967

PRAWN PROCESSING PLANT

PRODUCT DESCRIPTION

Frozen prawns. Various kinds of seafoods may also be produced in the plant.

A. GENERAL EVALUATION OF PROSPECTS

Where an adequate supply of prawns is available, the prospects for this industry should be excellent. There is a good world-wide market for frozen prawns and a very good profit in the investment is indicated.

B. MARKET ASPECTS

1. USERS

Homes, restaurants, hotels and institutions.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to wholesalers. Since this product is used in homes and wherever food is served, this market would have to be supplied through the use of refrigerated trucks. However, the sales value of the product would warrant such shipment nation-wide. The export outlook should prove excellent since prawns are a very good export product. If the plant is operated efficiently, a world-wide market should be developed. With good management, there should be no difficulty competing in the export market providing competitive prices are maintained. A sizeable investment is required to produce this product. The principal domestic competition that could be encountered would stem only from other local prawn-producing plants. This plant would not be entirely dependent upon the domestic market since a large export market is available and able to consume any surplus production.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally, may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $750,000.
The total fixed investment, plus working capital, is estimated at $578,800.
The annual gross profit, before taxes, is estimated at $70,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.3%.
(A gross profit on sales, before taxes, of 9.3%, while reflecting U.S. experience, should not be considered normal for a developing country, where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 12.1%.

5. COST PER MAN EMPLOYED

Forty-three direct workers and ten indirect workers, or a total of 53 workers, are employed.
The total fixed capital investment is estimated at $452,000.
Based on these figures, the fixed investment per man employed would amount to about $8,525.

C. PRODUCTION REQUIREMENTS PRAWN PROCESSING PLANT I.P. No. 67276
ANNUAL CAPACITY - ONE SHIFT OPERATION: 1,000,000 POUNDS S.I.C. 2036
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - One acre	
Building - One story 90' x 125'. Storage and insulation	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 452,000

Principal items:

Platform Scales, Freight Elevator, Washer, Preparation Conveyor, Washing and Drying Conveyor, Battering Machine, Breading Machine, Plat Freezer, Continuous Belt Freezer, Sizer, Batter Mixer, Dump Truck, Laboratory Equipment, Steam Jacketed Kettles, Band Saws, Fryer, Cooling Tunnel, Semi-Automatic Piston Filler, Heat Sealer, Cooling Tank, Shrimp Peeler and Deveiner, Compressor, Steam Generator

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 126,800
c. Total Capital Requirements	$ 578,800

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Prawns		
Batter and Breading Mix		
Hydrogenated Fat		
Wax Paper over-wrap		
Cartons and Shipping Cases		
Total direct materials		$ 270,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Cleaning and sanitizing chemicals	
Rubber Gloves and aprons	
Gas, oil and maintenance on truck	
Total supplies	$ 9,600

c. Availability of materials & supplies

All should be available locally.
All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 175 H.P. connected load	
Fuel - Bunker C oil	
Water - must be potable	$ 6,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 38,600

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	3	
Inspector	2	
Maintenance	2	
Truck Driver	1	
Total indirect labor	10	$ 66,000
b. Direct labor		
Skilled workers	5	
Semi-skilled workers	9	
Unskilled workers	28	
Total direct labor	43	$ 181,800

c. Training needs

Manager and supervisor should be fully experienced. They, with three skilled workers, should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

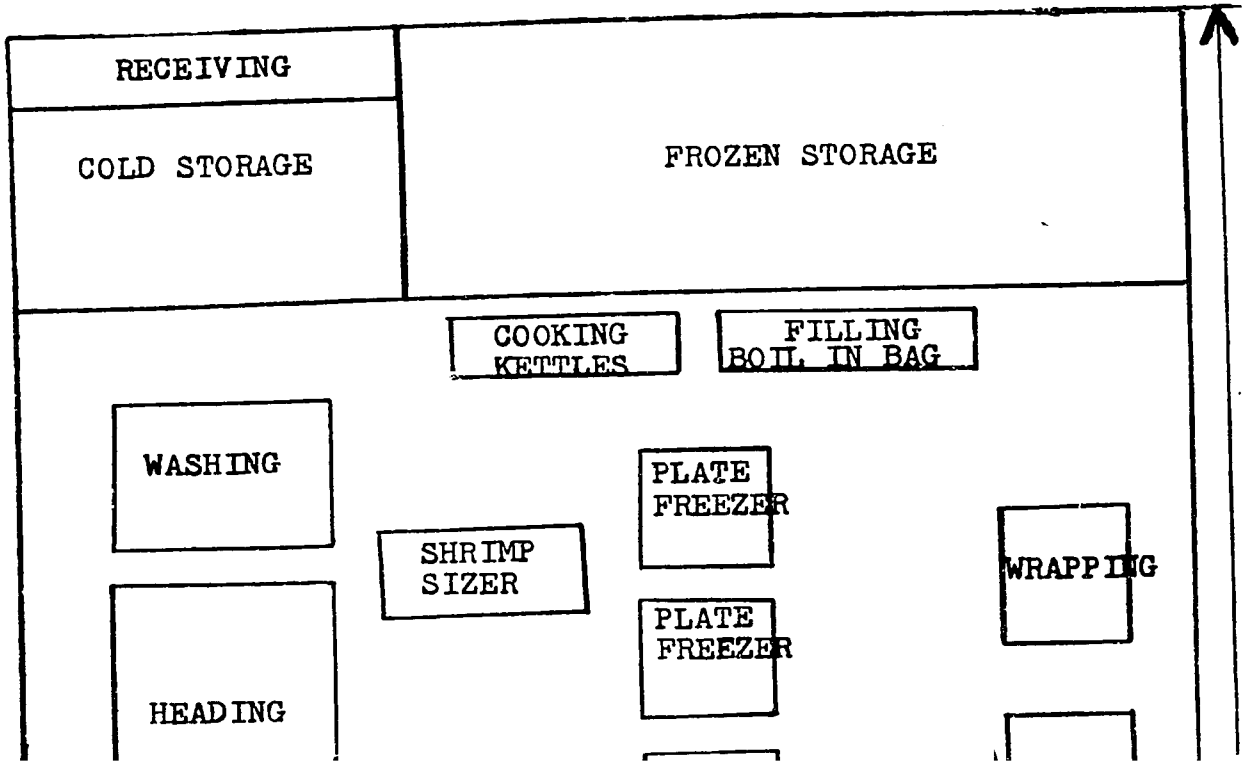
In and out shipments about 6 tons per day. Good highway, docking pier and railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 270,000	
Direct labor	181,800	
Manufacturing overhead*	120,200	
Total manufacturing cost		$ 572,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 60,000
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$ 680,000
Annual Gross Profit		$ 70,000
ANNUAL SALES REVENUE		$ 750,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYOUT



PRAWN PI

NG PLANT

I. P. NO. 67276
S.I.C. 2036

PRAWN PROCESSING PLANT

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. The Freezing Preservation of Foods. Vol. I. 3rd Edition. D.K. Tressler and C.F. Evers. 1957. $19.75

A.V.I. Publishing Company
Westport, Connecticut 06880

Deals with methods of freezing preservation of foods.

B. Federal Food, Drug, and Cosmectic Act, as amended.
General Regulations for its Enforcement, Title 21, Part 1, $3.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

II. TECHNICAL AND TRADE PERIODICALS

A. Fishing Gazette. Monthly. Controlled Free Distribution

Fishing Gazettee Publishing Corporation
461 Eighth Avenue
New York, New York 10001

B. Quick Frozen Foods Retailing. Monthly. $7.00/year.

E.W. Williams Publishing Company, Inc.
82 Wall Street
New York, New York 10005

Preparation, packaging, storage and distribution of frozen foods.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $0.20

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Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. No. 3,255,201. June 7, 1966 3 p.
Method of preparing a frozen seafood.

B. No. 3,152,915. October 13, 1964. 5 p.
Method of freezing, packaging, and breading shrimp and article resulting therefrom.

C. No. 3,245,226. April 12, 1966. 6 p.
Apparatus for quick freezing solid foods.

D. No. 3,213,634. October 26, 1965. 4 p.
Method and apparatus for individual quick freezing.

E. No. 3,162,020. December 22, 1964. 6 p.
Method of conserving and transporting fresh fish.

F. No. 3,166,425. January 19, 1965. 6 p.
Method of freezing cooked food.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Shrimp Association of the Americas
910 E. Levee St. P.O. Box 1665
Brownsville, Texas 78520

B. National Association of Frozen Food Packers
919 - 18th Street, N. W.
Washington, D. C. 20006

VI. DIRECTORIES

A. Directory of Frozen Food Processors and Products. Annual. $7.00

E. W. Williams Publications
1776 Broadway
New York, New York 10019

Lists alphabetically more than 1,800 frozen food processors.

VII. PROFESSIONAL ENGINEERING SERVICES

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INDUSTRY PROFILES

MECHANICAL SPRINGS

I. P. No. 67277
S. I. C. 3481

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MECHANICAL SPRINGS

PRODUCT DESCRIPTION

Spring produced in a wide variety of shapes such as coiled, spiral, flat, leaf, ring and numerous special shapes.

A. GENERAL EVALUATION OF PROSPECTS

Since these products are sold to and used by manufacturing industries, the prospects for this industry depend on the number and kinds of industries in the country. Many industries do not use large quantities of mechanical springs. A comprehensive market survey should be conducted to determine the sales potential.

B. MARKET ASPECTS

1. USERS

Industries.

2. SALES CHANNELS AND METHODS

Direct sales to industry. Because many of the products of this factory are especially designed to specifications of industrial plants and practically all of the spring products are sold to industry, the market needed to support this plant can be determined only by a comprehensive survey. Springs are light and well packaged and the cost of the product permits transportation of it on a national scale. Springs cannot be successfully manufactured on a small scale. Therefore, unless another mechanical spring plant exists within the country, there will be no domestic competition. There is also little likelihood of competition from imported machanical springs. This plant would have difficulty entering into competition in world markets although some export sales might be made to friendly neighboring countries not having a mechanical spring plant.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 440,000.
The total fixed investment, plus working capital, is estimated at $704,500.
The annual gross profit, before taxes, is estimated at $ 44,000.
Using these figures, the profit on gross sales, before taxes, amounts to 10%.
(A gross profit on sales, before taxes, of 10%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 6.3%.

5. COST PER MAN EMPLOYED

Twenty-one direct workers and seventeen indirect workers, or a total of thirty-eight workers, are employed.
The total fixed capital investment is estimated at $623,000.
Based on these figures, the fixed investment per man employed would amount to about $ 16,400.

C. PRODUCTION REQUIREMENTS MECHANICAL SPRINGS — I. P. NO. 67277

ANNUAL CAPACITY - ONE SHIFT OPERATION: 200,000 POUNDS OF SPRINGS — S.I.C. 3481

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 1 acre	
Building - one story 106' x 115'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 623,000

Principal items:

Alligator Shear, Ring Coilers, Spring Winder, Heating Furnace, Taper Rolling Machine, Ring Rollers, Spring Setting Machine, Hydraulic Coiling Machine, Cambering Machine, Flexible Casing Coiler, Heat Treat Equipment, End Hooking Machine, Forming Rools, Universal Milling Machine, Machine Tools for Die Department

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 81,500

c. Total Capital Requirements $ 704,500

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Spring steel stock	120 tons	
Packaging materials		
Total direct materials		$ 28,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Welding	
Heat treat, etc.	
Gas, oil and maintenance for truck	
Total supplies	$ 15,700

c. Availability of materials & supplies

Some may have to be imported. All are available in world market.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 150 KW per hour connected load	
Fuel - Heating	
Water - 800,000 gallons	$ 4,600

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 59,400

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	4	
Technical	4	
Maintenance	2	
Truck Driver	1	
Other	4	
Total indirect labor	17	$ 109,000
b. Direct labor		
Skilled workers	6	
Semi-skilled workers	9	
Unskilled workers	6	
Total direct labor	21	$ 102,600

c. Training needs

The manager, supervisor, and technical people should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments about one ton per day. Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 28,000	
Direct labor	102,600	
Manufacturing overhead*	188,700	
Total manufacturing cost		$ 319,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 40,700
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 396,000
Annual Gross Profit		$ 44,000
ANNUAL SALES REVENUE		$ 440,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

MECH

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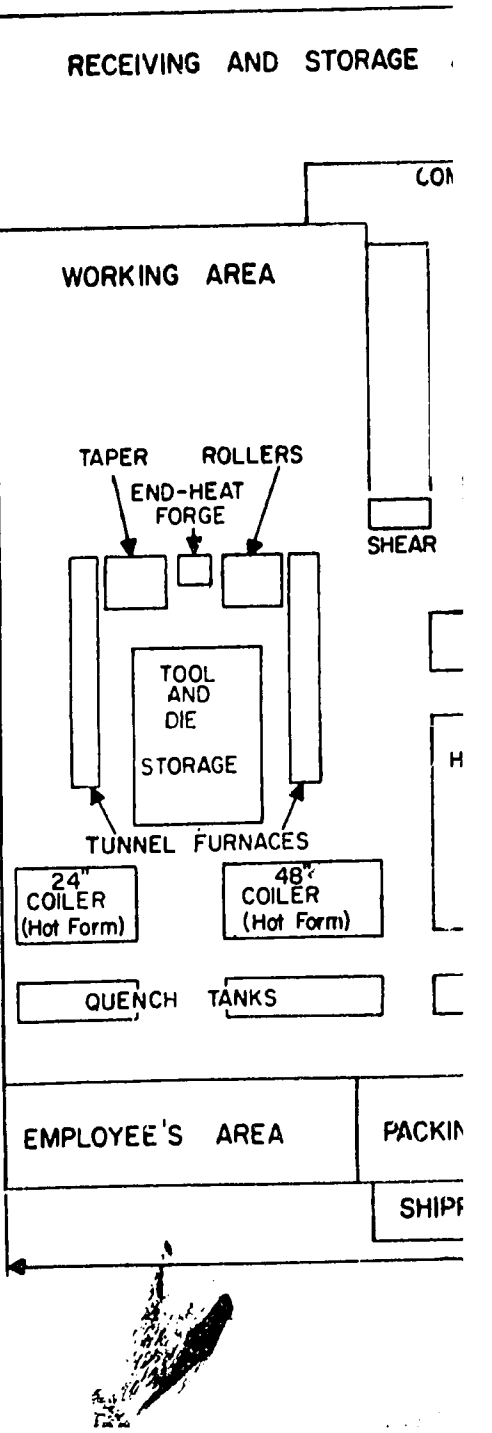
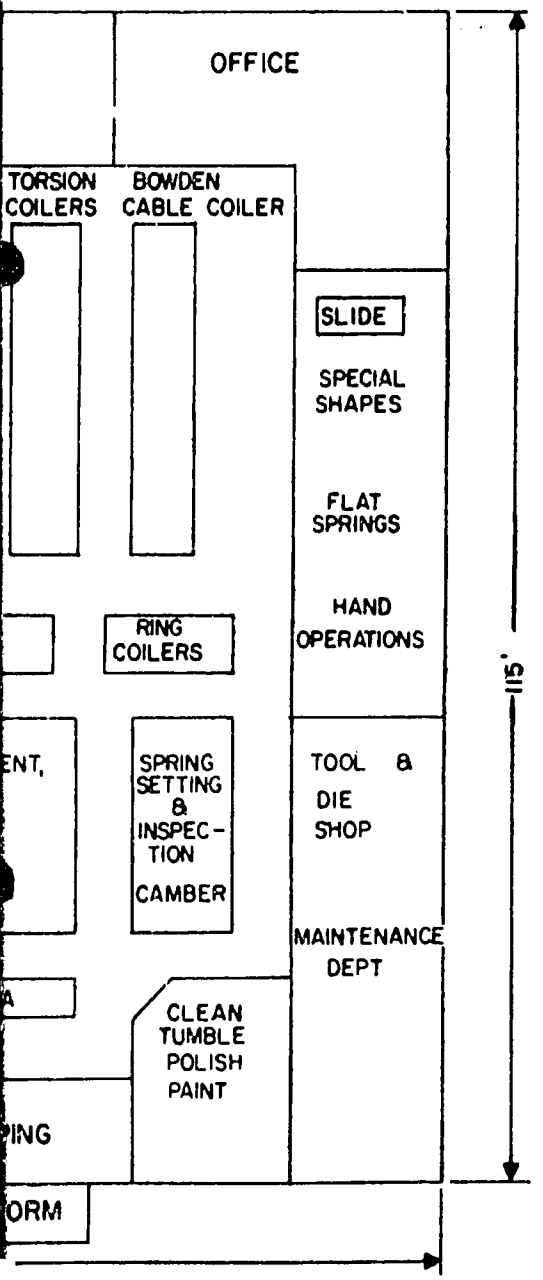

RECEIVING AND STORAGE
WORKING AREA
TAPER
ROLLERS
END-HEAT FORGE
SHEAR
TOOL AND DIE STORAGE
TUNNEL FURNACES
24" COILER (Hot Form)
48" COILER (Hot Form)
QUENCH TANKS
EMPLOYEE'S AREA

SPRINGS

I. P. NO. 67277
S.I.C. 3481

YOUT



MECHANICAL SPRINGS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Introduction to Engineering and Engineering Design. Edward V. Krick. 1965. $6.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

An extensive introductory description of engineering that employs case studies of "engineering in action".

B. Handbook of Engineering Machanics. W. Flugge. 1632 pp. 1024 Illus. 1962. $31.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Valuable information on the entire field of engineering mechanics.

II. TECHNICAL AND TRADE PERIODICALS

A. Modern Machine Shop. Monthly. Controlled free distribution.

Gardner Publications, Inc.
431 Main Street
Cincinnati, Ohio 45202

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

D. Starting and Managing a Small Business of Your Own. Wendell O. Metcalf. 49 pp. 1962. $.25. Vol. 1 (2nd Edition) of the Starting and Managing Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Pitfalls usually encountered when entering a new business. Sources of additional information given.

IV. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,238,754. March 8, 1966.
Method and machine for making non-cumulative force springs.

B. Patent No. 3,240,238. March 15, 1966. 7 p.
Method of making springs.

C. Patent No. 3,187,416. June 8, 1955. 3 p.
Method of manufacture of coil springs.

D. Patent No. 3,154,758. August 25, 1964. 7 p.
Apparatus for making power springs.

E. Patent No. 3,007,239. November 7, 1961. 14 p.
Method of making springs.

F. Patent No. 2,968,477. January 17, 1961. 4 p.
Mechanical, resilient pressure applying devices.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Spring Manufacturers Institute
81 Main Street
Bristol, Connecticut 06010

VI. DIRECTORIES

A. Machine Tools. Annual. Free.

Machinery Dealers National Association
P.O. Box 19128
Washington, D.C. 20036

Contains 250 names of companies in U.S. and Canada dealing in used metal-working machinery.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

SOYBEAN OIL AND MEAL

I. P. No. 67278
S. I. C. 2092

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67278
S. I. C. 2092
NOVEMBER 1967

SOYBEAN OIL AND MEAL

PRODUCT DESCRIPTION

Soybean oil is extracted from soybeans. Soybean meal is produced as a by-product.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend on the local availability of suitable soybeans and the potential market for both the oil and the meal. This industry requires a large investment in machinery and equipment, as well as in the raw materials. While the gross profits are substantial in comparison to both the sales and the fixed investment, a feasibility survey should be conducted to determine the prospects for the industry. This survey should include the availability, quality, and costs of raw materials, the potential market, both domestic and export, and the selling prices of both oil and meal.

B. MARKET ASPECTS

1. USERS

Approximately 98% of world's soybean oil production finds its way into human foods as shortening, margarine, vanaspati, vegetable ghee, salad dressing and liquid cooking oil. Soy flour is used in the meat industry as sausage stuffing and in luncheon meats, in baby foods and low calorie diet foods. Soybean meal is used as a stock feed.

2. SALES CHANNELS AND EXTENT OF MARKET

Oil would be sold direct to other industries and the by-product, soybean meal, sold direct to industrial users and distributors of stock feed. Domestic sales would be to local industries for further processing. The market for soybean meal as stock feed would be nationwide. Both oil and meal are exportable and production not consumed locally could enter the export market. This industry cannot operate profitably on a small scale. Unless other existing industries within the country produce the same products, this industry would have no competition. If the plant is well managed and efficiently operated it should be able to compete in world markets. A comprehensive market survey should be conducted to determine sales potential because the market for this industry cannot be measured in usual population terms since most of its products are sold to other local industries or exported.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would of necessity have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $1,834,000.
The total fixed investment, plus working capital, is estimated at $856,800.
The annual gross profit, before taxes, is estimated at $240,000.
Using these figures, the profit on gross sales, before taxes, amounts to 13.1%.
(A gross profit on sales, before taxes, of 13.1%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 28.0%.

5. COST PER MAN EMPLOYED

Twenty-four direct workers and 14 indirect workers, or a total of 38 workers, are employed.
The total fixed capital investment is estimated at $567,000.
Using these figures, the fixed investment per man employed would amount to about $14,920.

C. PRODUCTION REQUIREMENTS - SOYBEAN OIL AND MEAL — I. .NO. 67278
ANNUAL CAPACITY - THREE SHIFT OPERATIONS : 300 DAYS PER YEAR PROCESSING 15,000 TONS — S.I.C. 2092

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 3 acres	
Building - One story sheet metal 30'x60' & sheet metal bagging bldg.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 567,000

Principal items:
Solvent Plant
Cooling Equipment Refrigeration
Flaker
Conveyors
Roller Mill
Tanks and Bins
Bagging Equipment
Boiler
Grinding Equipment
Soybeans

b. Working Capital (30 Days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 289,800
c. Total Capital Requirements	$ 856,800

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Soybeans	15,000 tons	
Drums and bags		
Total direct materials		$ 1,200,000

b. Supplies

Lubricants & hand tools
Cutting tools & abrasives
Maintenance & spare parts
Office supplies
Gas, oil and maintenance of trucks

Total supplies	$ 10,200

c. Availability of materials & supplies

All should be available locally.

All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 1,000 H.P. connected load	
Fuel - Production Bunker C Oil	
Water - Sanitation & fire protection	$ 14,900

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 57,100

5. MANPOWER

a. Indirect labor	Number	Annual Cost
General Manager	1	
Office	3	
Shift Supervisor	3	
Maintenance	2	
Power Plant	3	
Truck driver	2	
Total indirect labor	14	$ 99,000
b. Direct labor		
Skilled workers	6	
Semi-skilled workers	6	
Unskilled workers	12	
Total direct labor	24	$ 109,200

c. Training needs

The manager with three supervisors and three skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Trucks.

b. External transport facilities

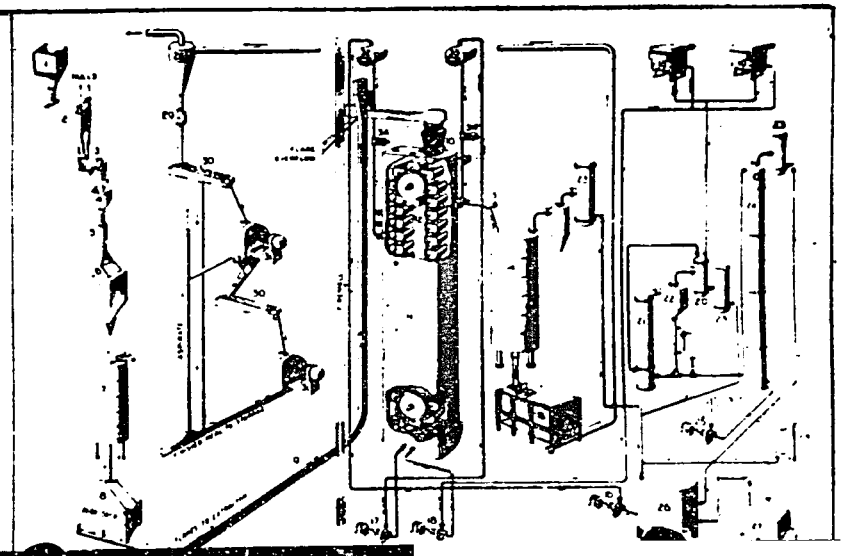
In and out shipments amount to 100 tons per day.
Plant should be located on a railorad.

7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$1,200,000	
Direct labor	109,200	
Manufacturing overhead*	181,200	
Total manufacturing cost		$ 1,490,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 67,600
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 1,594,000
Annual Gross Profit		$ 240,000
ANNUAL SALES REVENUE		$ 1,834,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

1 BEAN STORAGE
2 BEAN CLEANER
3 MAGNETIC SEPARATOR
4 SURGE BIN
5 SCALE
6 CRACKING ROLL
7 BEAN HEATER
8 FLAKING ROLLS
9 ELEVATOR TO EXTRACTOR
10 EXTRACTOR FILLING HOPPER
11 EXTRACTOR
12 EXTRACTOR BASKETS
13 SPENT FLAKE CONVEYOR
14 DESOLVENTIZER TOASTER
15 FLAKE COOLER
16 SOLVENT PUMP
17 HALF MISCELLA PUMP
18 FULL MISCELLA PUMP
19 MISCELLA FILTER
20 HEAT EXCHANGER
21 PRE-EVAPORATOR
22 ENTRAINMENT SEPARATOR
23 CONDENSER
24 VACUUM STRIPPING COLUMN
25 FINISHED OIL PUMP
26 SOLVENT WORK AND WATER SEPARATION TANK
27 WASTE WATER EVAPORATOR
28 CYCLONE
29 ROTARY VALVE
30 MEAL SCREEN
31 MEAL GRINDER
32 SOLVENT SURGE TANK
33 HALF MISCELLA SURGE TANK



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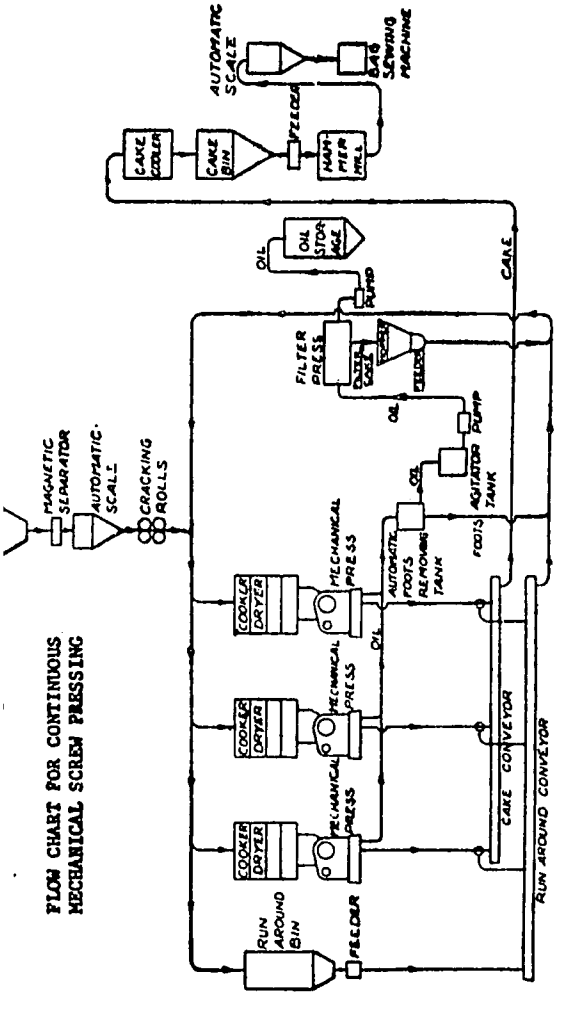
AND MEAL

I. P. NO. 67278
S. I. C 2092



FLOW CHART FOR CONTINUOUS MECHANICAL SCREW PRESSING

I. P. No. 67278
S. I. C. 2092

SOYBEAN OIL AND MEAL

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Soybean Industry. Ray A. Goldberg. 1952. Illus. $5.00

University of Minnesota Press
2037 University Avenue, S.E.
Minneapolis, Minnesota 55414

B. Bailey's Industrial Oil and Fat Products. Daniel Swern. 3rd edition. 1964. Illus. $25.00.

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

The nature of fats and oils, raw materials for oil and fat products.

C. Soybeans and Soybean Products : Their Chemistry and Technology. Klare S. Markley. Volume I, 558 pp. 215 Illus. 1950. $16.50. Volume II, 623 pp. 173 Illus. 1951. $16.50.

John Willey & Sons, Inc.
605 Third Avenue
New York, New York 10016

Deals with all phases of soybean structure and composition, handling, storage, mechanical processing, utilization of soybean products, their nutritional value and other topics.

II. TECHNICAL AND TRADE PERIODICALS

A. Food Processing. Monthly. $7.00/year.

Putnam Publishing Company
111 East Delaware Place
Chicago, Illinois 60611

Food processing and maunfacturing.

B. Food Engineering. Monthly. $25.00/year.

Chilton Company
Chestnut and 56th Streets
Philadelphia, Pennsylvania 19139

Deals in management of food manufacturing.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $0.20

Small Business Management Series No. 4
U.S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
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Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. No. 3,253,930, May 31, 1966. 5 p.
Method of heat treating soybeans.

B. No. 3,228,773. January 11, 1966. 3 p.
Method for producing a soybean product.

C. No. 3,141,851. November 30, 1965. 4 p.
Treatment of soybeans.

D. No. 3,142,571. July 28, 1964. 4 p.
Method for producing a soybean protein product.

E. No. 3,126,285. March 24, 1964. 6 p.
Method of disolventing and toasting soybean meal.

F. No. 3,099,649. July 30, 1964. 3 p.
Process for refining of vegetable protein.

G. No. 3,083,365. March 26, 1963. 3 p.
Process of removing oils from seeds, etc.

H. No. 3,069,443. December 18, 1962. 4 p.
Method of treating soybean oil.

I. No. 3,058,829. October 16, 1962. 3 p.
Method of peeling and processing soybeans and apparatus therefor.

J. No. 3,023,107. February 27, 1962. 2 p.
Production of an undenatured debittered soybean product.

K. No. 3,012,888. December 12, 1961. 3 p.
Method for preparing a granular oil free phosphatic product.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Soybean Processors Association
141 West Jackson Boulevard
Chicago, Illinois 60604

VI. DIRECTORIES

A. Soybean Blue Book - Annual. $2.00 to members; $3.00 to non-members.

American Soybean Association
Hudson, Iowa

3,000 soybean processors, exporters, market analysts, manufacturers of soybean equipment, processors.

VII. PROFESSIONAL ENGINEERING SERVICES

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Springfield, Virginia 22151

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GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

PAJAMAS, COTTON

I. P. No. 67279

S. I. C. 2321; 2341

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I.P. No. 67279
S.I.C. 2321; 2341
DECEMBER 1967

PAJAMAS, COTTON

PRODUCT DESCRIPTION

Pajamas made from cotton material for men, women and children.

A. GENERAL EVALUATION OF PROSPECTS

The amount of capital needed to establish this factory is relatively modest. If the gross sales potential seems readily available and the plant is well managed and efficiently operated, prospects for this industry should be good. The machinery and equipment in this plant can be used to make other types of wearing apparel for men, women and children.

B. MARKET ASPECTS

1. USERS

Cotton pajamas are worn by men, women and children.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made to wholesalers for distribution to small retail stores and direct sales would be made to large stores. The market needed for successful operation of this plant will depend upon the per capita income of the population and their clothing tastes. The value of this product is high in relation to its weight and bulk; it is easily handled and well packaged. Therefore, transportation costs will be relatively low making nationwide distribution feasible. The only competition that could be expected in the domestic market will come from other plants making the same products. This factory should experience no difficulty competing against imported pajamas since it has the advantage of lower freight costs and no import duties to pay. This plant would not be able to compete with large mass producers of cotton pajamas in the international marketplace.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $240,000
The total fixed investment, plus working capital, is esimated at $73,600.
The annual gross profit, before taxes, is estimated at $22,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.2%.
(A gross profit on sales, before taxes, of 9.2%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 30%.

5. COST PER MAN EMPLOYED

Twenty-two direct and five indirect workers, or a total of twenty-seven workers, are employed.
The total fixed capital investment is estimated at $31,000.
Based on these figures, the fixed investment per man employed would amount to $1,150.

C. PRODUCTION REQUIREMENTS PAJAMAS, COTTON — I. P. No. 67279
ANNUAL CAPACITY - ONE SHIFT OPERATIONS: 72,000 PAIRS — S.I.C. 2321; 2341
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a FIXED CAPITAL

	Cost
Land - about 8,000 sq. ft.	
Building - one story, 30' x 80'; may use any suitable local materials	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 31,000

Principal Items :

Cloth spreader
Cutting table
Marking drill
18 Sewing machines
Steam iron
Work table
Stands
Racks

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 42,600

c. Total Capital Requirements — $ 73,600

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Cotton Cloth	Quantities as needed	
Thread		
Buttons		
Scraps		
Boxes		
Total direct materials		$ 35,000

b. Supplies

Lubricants & hand tools	
Gas, oil and maintenance of truck	
Maintenance & spare parts	
Office supplies	
Total supplies	$ 2,500

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - about 20 H. P. connected load	
Fuel - heating	
Water - sanitation and fire protection	
	$ 1,200

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 2,900

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Office	2	
Machine Fixer	1	
Truck Driver	1	
Total indirect labor	5	$ 30,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	18	
Unskilled workers	2	
Total direct labor	22	$ 109,800

c. Training needs

Manager, machine fixer, and 2 skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments about one ton per day.

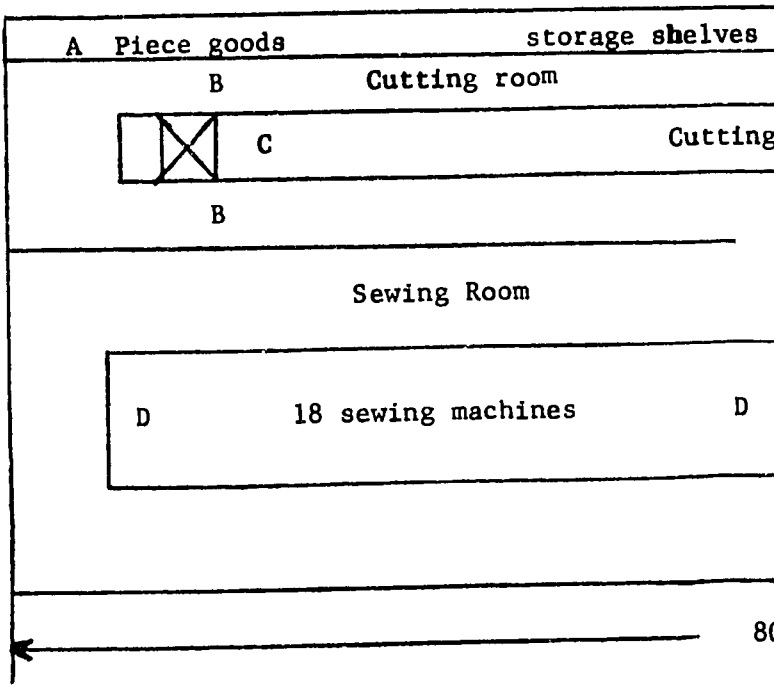
Good highways.

7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 35,000	
Direct labor	109,800	
Manufacturing overhead*	36,600	
Total manufacturing cost		$ 181,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 18,600
Sales expense		$ 12,000
Freight-out, travel discounts Allowance & bad debts		$ 6,000
Total annual costs		$ 218,000
Annual Gross Profit		$ 22,000
ANNUAL SALES REVENUE		$. 240,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYOUT

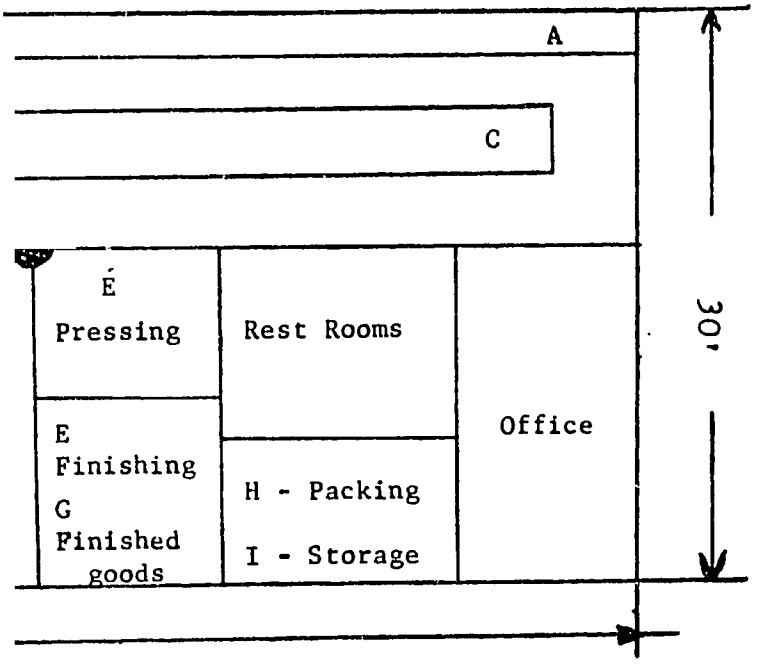


A — A. Piece goods
B — B. Cloth spreader
C — C. Cutting table, cloth spr
D — D. Sewing machines
E. Steam iron, pressing
F. Finishing
G. Finished goods, storing
H. Packing
I. Storage

TTON

I.P. NO. 67279
S.I.C. 2321; 2341

WORK FLOW



arking, cutting and assembly/

PAJAMAS, COTTON

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Apparel Manufacturing Analysis. Jacob Solinger. 1961. 800 pp. Illus. $25.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Nature and scope of apparel production including raw materials, design, cutting, sewing production equipment and machine operation, molding production, packaging, time and motion study, plant layout, organization, wages, sales engineering and cost controls.

B. Clothing Construction. E. A. Mansfield. 1953. 454 pp. Illus. $7.50

Houghton Miflin Company
2 Park Street
Boston, Massachusetts 02108

Covers all types of clothing manufacture.

II. TECHNICAL AND TRADE PERIODICALS

A. Apparel Manufacturer. Monthly. $5.00/year

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Information about the apparel manufacturing industry; new processes, equipment, products.

B. The Bobbin Magazine. Monthly. $4.00

Needle Trades Publishing Company
P. O. Box 1354
Columbia, South Carolina 29202

Management magazine for needle trades industries.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer an Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

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Prepared by Small Business Administration to assist in the development of management in small business.

V. REPRESENTATIVE U.S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,156,927 November 17, 1964 10 p.
Method and apparatus for manufacturing garments.

B. Patent No. 3,078,467 February 26, 1963 6 p.
Garment and method of making same.

C. Patent No. 2,896,630 July 28, 1959 5 p.
Women's sleeping garment.

D. Patent No. 2,807,022 September 24,1957 3 p.
Bed garment.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Apparel Manufacturers Association, Inc.
2000 "K" Street, N. W.
Washington, D. C. 20006

VI. DIRECTORIES

A. Apparel Manufacturers Directory. Annual. $3.00

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists 5,000 suppliers of garment industry fabrics, trimmings, machinery and equipment.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410 12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

OPTICAL OR PRECISION GLASS

I. P. No. 67280
S. I. C. 3211

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67280
S.I.C. 3211
DECEMBER 1967

OPTICAL OR PRECISION GLASS

PRODUCT DESCRIPTION

Optical or precision lenses.

A. GENERAL EVALUATION OF PROSPECTS

The annual production of this plant as shown in the fact sheet is 1,000 pounds per day or 300,000 pounds per year based on operating 300 days per year. The gross annual sales are estimated at $1,350,000. Obviously, in some countries the production capacity of this plant would exceed the potential local sales. While a plant having 50 percent of the production shown in this fact sheet could be operated profitably if sales were available locally, the following factors must be considered: the capital investment is large compared with gross sales; thirty five skilled and thirty-five semi-skilled workers are needed and it takes years of experience to become a skilled worker in this industry. Export sales potential is not good in most instances. Therefore, a very comprehensive survey of all factors involved should be made in order to evaluate the prospects for this industry in proper perspective.

B. MARKET ASPECTS

1. USERS

Opticians and manufacturers of instruments that require lenses.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be direct to opticians and optical instrument manufacturers. The market depends on the existence, within the country, of manufacturers that produce instruments using lenses and on the number of opticians doing business in the country and the volume of business they maintain. This industry cannot be operated successfully on a small basis. Therefore, unless there are other optical glass plants operating in the country, domestic competition would not exist. If this plant is well-managed, it should be able to compete against imported lenses. Optical glass is light and packaged well. It can be shipped by mail and this makes distribution on a national scale easy. Export to neighboring countries having no optical glass plants may prove feasible.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $1,350,000.
The total fixed investment, plus working capital, is estimated at $2,055,500.
The annual gross profit, before taxes, is estimated at $140,000.
Using these figures, the profit on gross sales, before taxes, amounts to 10.4%.
(A gross profit on sales, before taxes, of 10.4%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 6.9%.

5. COST PER MAN EMPLOYED

Seventy-eight direct workers and twelve indirect workers, or a total of ninety workers, are employed.
The total fixed capital investment is estimated at $1,825,000.
Based on these figures, the fixed investment per man employed would amount to about $20,275.

C. PRODUCTION REQUIREMENTS - OPTICAL OR PRECISION GLASS — I.P. No. 67280
ANNUAL CAPACITY - THREE SHIFT OPERATION : 300 DAYS PER YEAR : 300,000 POUNDS — S.I.C. 3211
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 4 acres	
Building - 150' x 400' or 60,000 sq. ft. Any suitable fireproof materials	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 1,825,000

Principal items:

Raw materials preparation equipment : 5 four-pot Arches, 4 Melting Furnaces (single pot complete with stirring machines), 8 Thermal Slabbing Kilns complete, 20 Pot Cooling Hoods, Slabbing Kiln Furniture and Molds, Rough Annealer, 5 Fine Annealers, Repressing Equipment including Small Kiln and Hand Pressing Machine, Laboratory and Inspection Equipment, Grinding and Polishing Equipment, General Plant Operating and Maintenance Equipment

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 230,500
c. Total Capital Requirements	$2,055,500

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Materials will vary depending on the physical properties of the glass produced.		
Packaging material		
Total direct materials		$ 210,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Refractory melting pots	
Steel hoops	
Gas, oil and maintenance for truck	
Total supplies	$ 20,600

c. Availability of materials & supplies

Most of the materials and supplies should be available locally. Some of the chemicals may have to be imported.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 600 kilowatts	
Fuel - Gas or butane	
Water - 100 gallons per minute. Make up water	$ 49,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 162,700

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Supervisor	3	
Office	4	
Chemist	1	
Maintenance	2	
Truck Driver	1	
Total indirect labor	12	$ 92,000
b. Direct Labor		
Skilled workers	35	
Semi-skilled workers	35	
Unskilled workers	8	
Total direct labor	78	$ 413,800

c. Training needs

Manager and supervisors should have years of experience. If skilled workers are not available locally, the plant should be installed on a turnkey basis and skilled workers imported for training purposes.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Large amounts of sand required. Plant should be located on a railroad.

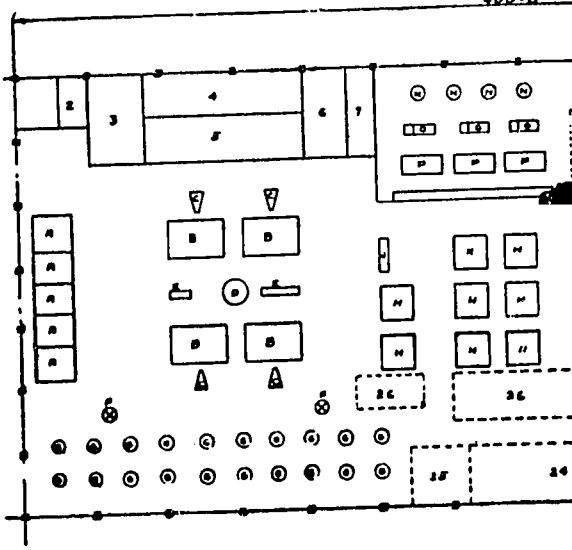
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct Materials	$ 210,000	
Direct labor	413,800	
Manufacturing overhead*	325,000	
Total manufacturing cost		$ 948,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 151,200
Sales expense		$ 60,000
Freight-out, travel discounts Allowances & bad debts		$ 50,000
Total annual costs		$1,210,000
Annual Gross Profit		$ 140,000
ANNUAL SALES REVENUE		$1,350,0 00

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

OPTICAL OR PREC

Plant Layou



Key to Numbers

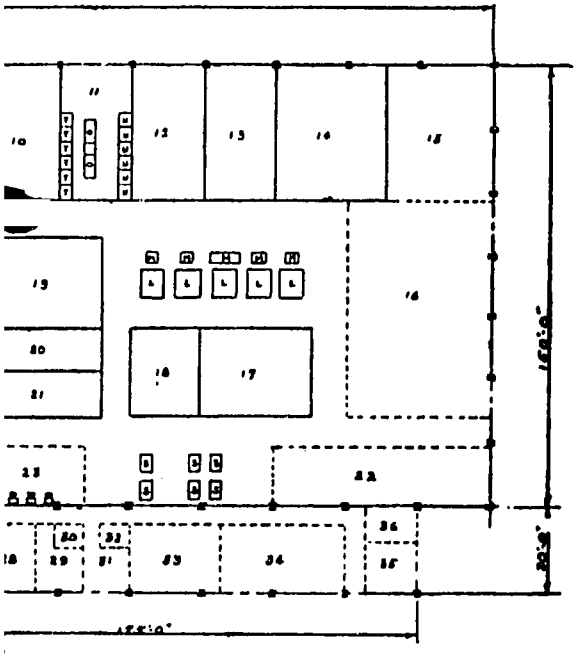
1. Elevator
2. Stairs
3. Batch Mixing Room
4. Sand Washing Equipment
5. Cullet Sorting and Storage
6. Chemical Laboratory
7. Melting Foreman's Office
8. Grinding and Polishing Room
9. Pitch Application Area
10. Polishing Room Supplies
11. Grinding Wheel and Saw Room
12. Physical Laboratory
13. Inspection Laboratory
14. Optical Testing Laboratory
15. Packing Material Storage
16. Finished Stock Storage
17. Ware-in-process Storage
18. Storage of Presses and Molds
19. Rough Stock Storage
20. Women's Rest Room
21. Men's Res
22. Wrapping
23. Trimming
24. Chipping
25. Saws
26. Storage Thermal
27. Payroll O
28. Employm
29. Informati
30. Men's Re
31. Receptio
32. Ladies' R
33. Accounti
34. General
35. Manager'
36. Assistant

Additional space requirements, such as refractory stor compressor room could be located in the basement of t conditions may dictate.

SION GLASS

I. P. NO. 67280
S. I. C. 3211

GLASS : S.I.C. 3211



Key to Letters

A. (Four-Pot) Pot Arches
B. Single Pot Furnace
C. Stirring Machine
D. Stack
E. Pot Furnace Control Panels
F. Water Spray Positions
G. Pot Cooling Hoods
H. Thermal Slabbing Kilns
J. Thermal Slabbing Kiln Controls
K. Rough Annealler
L. Fine Annealler
M. Fine Annealler Controls
N. Grinders
O. Table and Tubs
P. Polishers
R. Trimming Grinders
S. Repressing Furnaces
T. Saws
U. Grinding Wheels

ıg
a
ıspection Area
nks for
Room
fice

ge, raw material storage, maintenance room, and
ng or in separate adjacent buildings as the local

I.P. No. 67280
S.I.C. 3211

OPTICAL OR PRECISION GLASS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Glass, Its Industrial Applications. Charles J. Phillips. $6.95

Reinhold Publishing Company
430 Park Avenue
New York, New York 10022

B. Optical Tooling for Precise Manufacture and Alignment. Philip Kissam. $10.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

II. TECHNICAL AND TRADE PERIODICALS

A. Glass Industry. Monthly. $5.00/year

Glass Publishing Company
777 Third Avenue
New York, New York 10017

Devoted to glass technology, engineering materials, and glass factory equipment, and operation.

B. Applied Optics. Monthly. $10.00/year

Optical Society of America
1155 16th Street, N. W.
Washington, D. C. 20006

Broad coverage of the optical industry of interest to technicians, engineers and technologists.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handing in Small Plants. $.20

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Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

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IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,216,836. November 1965 2 p.
Related to improvements in optical crown glass.

B. Patent No. 3,212,401. October 1965 9 p.
Inhomogenous Magnesia-Alumina Optical lens.

C. Patent No. 3,193,400. July 1965 3 p.
Optical glass.

D. Patent No. 3,150,990. September 29, 1964 3 p.
Optical glass.

E. Patent No. 3,149,984. September 22, 1964 3 p.
Lead glass for optical use.

F. Patent No. 3,145,114. August 18, 1964 3 p.
Process for increasing the index of refraction of glass and an article made thereby.

G. Patent No. 3,009,819. 1961 5 p.
Glass intended for optical purposes.

H. Patent No. 3,006,776. 1961 1 p.
Composition of an optical glass.

I. Patent No. 2,999,027. 1961 4 p.
Method of manufacture of a precision glass.

J. Patent No. 2,996,391. 1961 2 p.
Optical glass of low dispersion.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Optical Manufacturers Association
30 East 42nd Street
New York, New York 10017

VI. DIRECTORIES

A. American Glass Review - Glass Factory Directory Issue. Annual. $4.00

Ebel-Doctrow Publishing, Inc.
23 East 26th Street
New York, New York 10010

Gives detailed information about some 500 glass manufacturers and their products. Available only as part of annual subscription to "American Glass Review" $5.00/year.

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

SOUVENIRS AND SMALL JEWELRY

I. P. No. 67281
S. I. C. 3911

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I.P. No. 67281
S.I.C. 3911
DECEMBER 1967

SOUVENIRS AND SMALL JEWELRY

PRODUCT DESCRIPTION

The exact product will depend upon the location of the plant and the type of semi-precious stones that are available. The souvenirs should be appropriate to the country in which they are made in order to meet tourist trade requirements. The jewelry would be made from semi-precious metals and semi-precious stones.

A. GENERAL EVALUATION OF PROSPECTS

These products would be considered luxury items in countries where the per capita income of the working class is low. Therefore, in most instances, the prospects for this industry depend on tourist trade. For this reason, it is difficult to evaluate the prospects for this industry and a comprehensive survey of both domestic and tourist trade is recommended.

B. MARKET ASPECTS

1. USERS

Principally tourists, some domestic trade.

2. SALES CHANNELS AND EXTENT OF MARKET

Direct sales will be made from the plant and to gift shops. This being a very small plant, operated by the owners and only one worker, the market would be confined to the city in which the business is located. The investment is relatively small in this industry and anyone with technical experience and a little capital could engage in this business. For this reason, competition can be keen. No competition can be expected from imported items since the souvenirs and jewelry envisioned in this profile would require local semi-precious stones as raw materials and would be manufactured in a manner and design appropriate only to the country in which they are made. The small size of this plant precludes its entering the export field.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $30,000.
The total fixed investment, plus working capital, is estimated at $12,100.
The annual gross profit, before taxes, is estimated at $5,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 16.7%.
(A gross profit on sales, before taxes, of 16.7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 41%.

5. COST PER MAN EMPLOYED

One direct and one indirect worker, or a total of two workers, are employed.
The total fixed capital investment is estimated at $7,500.
Based on these figures, the fixed investment per man employed would amount to $3,750.

C. PRODUCTION REQUIREMENTS - SOUVENIRS AND SMALL JEWELRY — I.P. No. 67281
ANNUAL CAPACITY - ONE SHIFT OPERATIONS : 29,000 — S.I.C. 3911
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 5,000 sq. ft.	
Building - 20' x 30' one story	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 7,500

Principal items:

Model makers tools
Rubber mold making equipment
Wax pattern making equipment, flakes
Wax burn out equipment
Melting furance, tong crucible
Casting machine, crucibles
Incidential equipment
6 benches, handmade

b. Working Capital	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 4,600
c. Total Capital Requirements	$ 12,100

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Mold rubbers		
Molding wax		
Precious metals		
Total direct materials		$ 10,000
b. Supplies		
Lubricants & hand tools		
Cutting tools & abrasives		
Maintenance & spare parts		
Office supplies & incidentials		
Total supplies		$ 100

c. Availability of materials & supplies

All available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - Lights	
Fuel - Heating	
Water - Small amount	
	$ 100

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment		
Furniture & fixtures	10	
Total depreciation		$ 500

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Owner manager	1	
Total indirect labor	1	$ 6,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	0	
Unskilled workers	0	
Total direct labor	1	$ 6,000

c. Training needs
Both men skilled; no training required.

6. TRANSPORTATION

a. Own transport equipment
None.

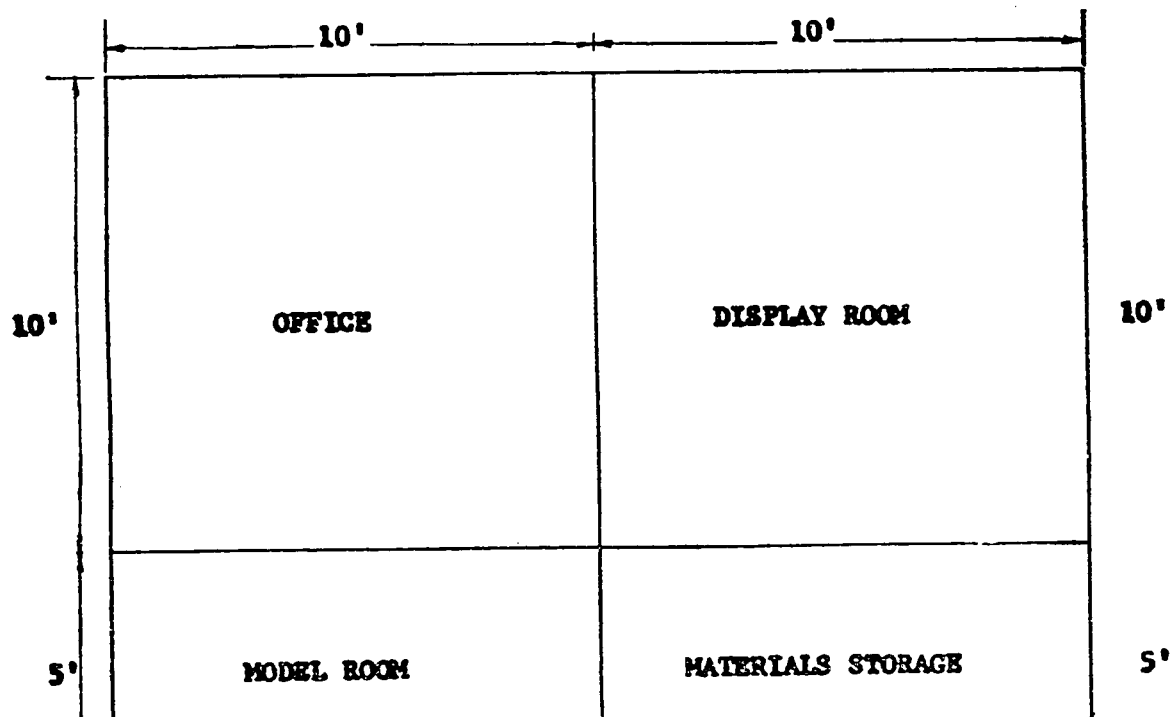
b. External transport facilities

No trucking required.

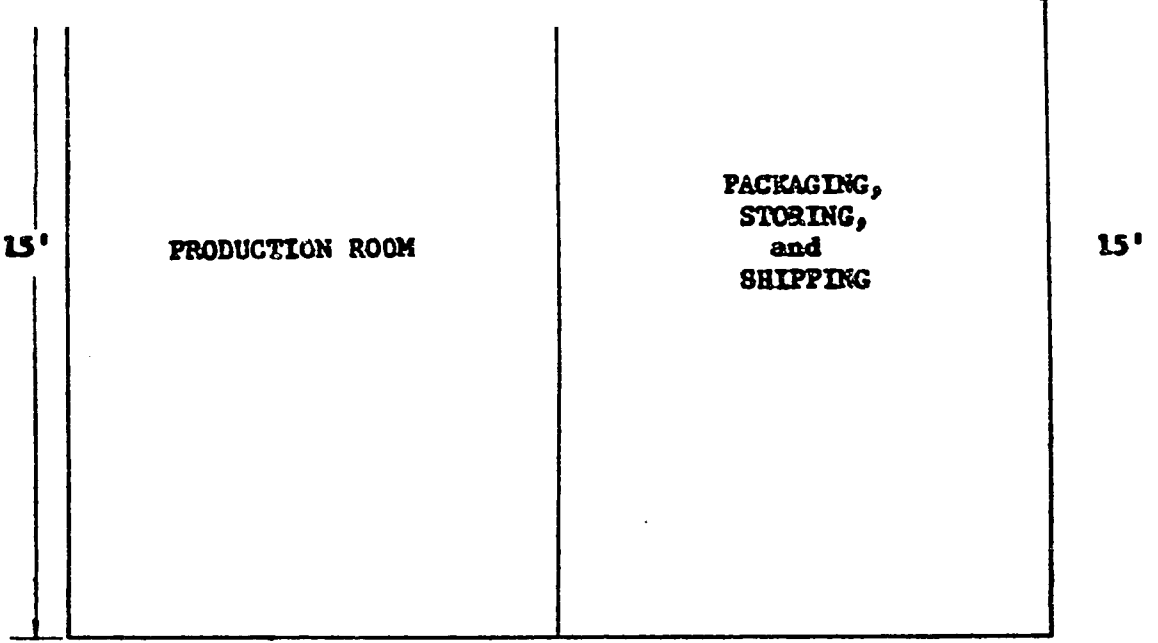
7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 10,000	
Direct labor	6,000	
Manufacturing overhead*	6,700	
Total manufacturing cost		$ 22,700
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 2,000
Sales expense		None
Freight-out, travel discounts		
Allowances & bad debts		$ 300
Total annual costs		$ 25,000
Annual Gross Profit		$ 5,000
ANNUAL SALES REVENUE		$ 30,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.


10'
10'
10'
OFFICE
DISPLAY ROOM
10'
5'
MODEL ROOM
MATERIALS STORAGE
5'

SOUVENIRS A



Suggested layout for a jewelry plant.

I.P. No. 67281
S.I.C. 3911

SOUVENIRS AND SMALL JEWELRY

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Jewelry, Gem Cutting and Metalcraft. 3rd Edition. William T. Baxter. 1950. 360 pp. 175 Illus. $7.75

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Metalcraft and jewelry making. The art of gem stone cutting, identification of gem stones and gem materials.

B. Indian Jewelry. B. Bhushan. 1955. Illus. $8.75

Harlem book Company
221 Fourth Avenue
New York, New York 10003

Ornaments and decorative designs.

II. TECHNICAL AND TRADE PERIODICALS

A. Northwestern Jewelry. Monthly. $1.00/year.

Trades Publishing Company
Washington and Main Streets
Albert Lea, Minnesota 56007

B. National Jewelry. Monthly. $3.00/year.

Schwartz Publications
6 West 57th Street
New York, New York 10019

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. Starting and Managing a Small Business of Your Own. Wendell O. Metcalf. 49 pp. 1962. $.25. Vol. I (2nd Edition) of the Starting and Managing Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Pitfalls usually encountered when entering a new business. Sources of additional information given.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,261,181. July 19, 1966. 5 p.
Finger ring releasably lockable over knuckle joint.

B. Patent No. 3,261,072. July 19, 1966. 5 p.
Jewel setting.

C. Patent No. 3,255,661. June 14, 1966. 3 p.
Finger ring display and method of making.

D. Patent No. 3,246,388. April 19, 1966. 4 p.
Method of making an adjustable ring.

E. Patent No. 3,208,239. September 28, 1965. 3 p.
Pierced earring.

F. Patent No. 3,154,841. November 3, 1964. 3 p.
Method of manufacture of an article of jewelry.

G. Patent No. 3,127,757. April 7, 1964. 3 p.
Finger ring of arcurate members snap-fitted together prior to soldering.

H. Patent No. 3,120,153. February 4, 1964. 5 p.
Method and apparatus of broaching.

I. Patent No. 3,109,229. November 5, 1963 3 p.
Method of manufacture of a cuff link.

J. Patent No. 3,052,966. September 11, 1962 3 p.
Method of making a cuff link.

K. Patent No. 3,025,820. March 20, 1962 3 p.
Method of forming ring-like frames for jewelry and the like.

L. Patent No. 2,948,041. August 9, 1960 2 p.
Ear clip component.

M. Patent No. 2,902,749. September 8, 1958 5 p.
Method of making a finger ring.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Jewelry Manufacturers Association
400 Madison Avenue
New York, New York 10017

B Manufacturing Jewelers and Silversmiths of America, Inc.
S - 75 Sheraton-Biltmore Hotel (First Floor)
Providence, Rhode Island 02902

VI. DIRECTORIES

A. The Fabricators Handbook. $1.50 per copy.

Walter B. Frost and Company
Wakefield, Rhode Island 02879

Lists 5,000 manufacturers, wholesalers, importers, and manufacturers representatives of jewelry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of a private professional engineer are not likely to be needed to establish a souvenir and small jewelry shop since the space required is usually rented. Manufacturers of jewelry repair equipment employ engineers and specialists familiar with the design and installation of their specialized machinery. These manufacturers usually give prospective customers the benefit of technical advice to determine the suitability of their equipment for the enterprise in question.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

SCHOOL FURNITURE

I. P. No. 67282
S. I. C. 2531

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67282
S.I.C. 2531
DECEMBER 1967

SCHOOL FURNITURE

PRODUCT DESCRIPTION

Wooden desks and chairs to be used in elementary schools. These products are finished in lacquer and are moveable.

A. GENERAL EVALUATION OF PROSPECTS

The equipment in this plant can produce many kinds of school furniture including students' drafting tables, instructors' drafting tables, office and teachers' desks, class room tables, instructors' tables and benches, work benches, typewriter tables and many other items that are used in schools. The manufacturing processes used in this plant are relatively simple and the capital requirements comparatively modest. Many developing countries have a supply of workers accustomed to woodworking and it should not be difficult to train labor in the operations of this plant. Technically, the industry appears well-suited to the existing conditions in many developing countries. An ample supply of lumber is usually available; new schools are being constructed. This project should therefore, be given careful consideration. If dried lumber is not available, a dry kiln should be installed.

B. MARKET ASPECTS

1. USERS

These products are designed and built for use in schools and would not be suitable as special designs for other purposes.

2. SALES CHANNELS AND EXTENT OF MARKET

Since this furniture is designed for school use and seldom, if ever, used for other purposes, the market for this plant would depend entirely upon the amount of school construction within the country. Sales would be made directly to the Board of Education. Therefore, a comprehensive study of the amount of school construction being contemplated is mandatory. School furniture is bulky and not easy to handle. The value is not high in relation to transportation costs so the extent of the domestic market should be nationwide, wherever schools are located. Because of the high freight costs in relation to export sales prices, school furniture is not common in international trade and no competition can be expected from imported products. Domestic competition would come only from other fully-equipped factories of this kind. Since the lumber for these items has to be tongued, grooved and bonded together, small woodworking shops not possessing the necessary equipment would be unable to produce furniture of this quality.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $200,000.
The total fixed investment, plus working capital, is estimated at $108,600.
The annual gross profit, before taxes, is estimated at $ 14,000.
Using these figures, the profit on gross sales, before taxes, amounts to 7%.
(A gross profit on sales, before taxes, of 7%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 13%.

5. COST PER MAN EMPLOYED

Fourteen direct and six indirect workers, or a total of twenty workers, are employed.
The total fixed capital investment is estimated at $ 74,000.
Based on these figures, the fixed investment per man employed would amount to $3,700.

C. PRODUCTION REQUIREMENTS SCHOOL FURNITURE

ANNUAL CAPACITY - ONE SHIFT OPERATION : 15,000 DESKS - 15,000 CHAIRS.

I.P. No. 67282
S.I.C. 2531

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 2 acres including lumber yard	
Building - one story 60' x 80'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 74,000

Principal Items :

Radial Saw, Jointer, Planer, Ripsaw, Trimsaw, Glue Jointer, Glue Reel, Band Saw, Drill Press, Single-end Tenoners, 3 Drum Sander, Drum Sander, Assembly Presses, Spray Booth

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 34,600
c. Total Capital Requirements	$108,600

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Lumber, dried	250,000 bd. ft.	
Hardware		
Glue		
Lacquer		
Crating		
Total direct materials		$ 33,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,000

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

a. Electric Power - About 800 K.W.H. per day Fuel - Scrap wood used Water - Sanitation and fire protection	Annual Cost $ 1,850

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 6,650

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Foreman	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct Labor		
Skilled workers	2	
Semi-skilled workers	6	
Unskilled workers	6	
Total direct labor	14	$ 63,600

c. Training Needs.

The manager with the supervisor and two skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment.

Truck

b. External transport facilities.

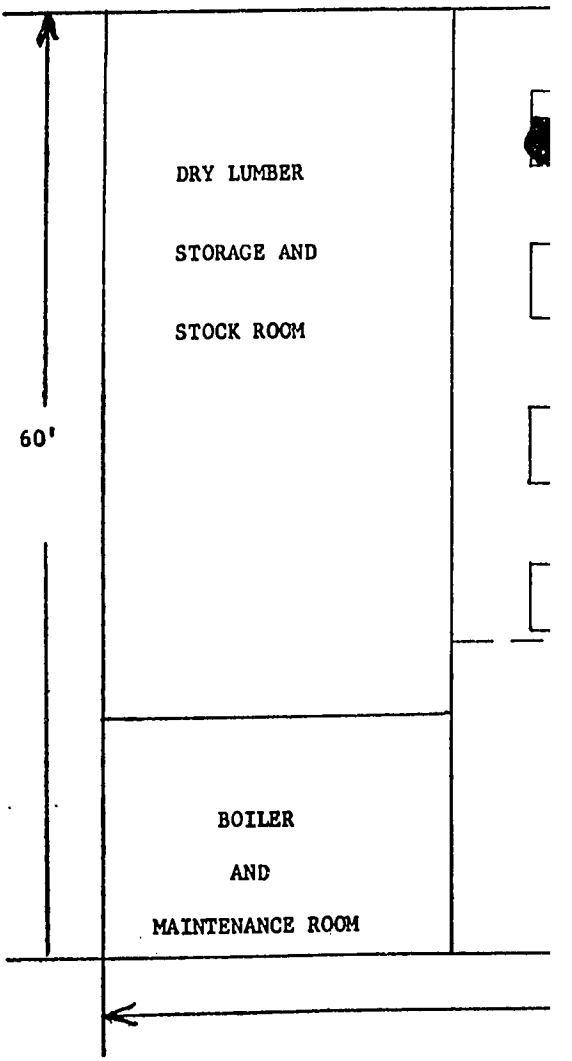
Good highways.
Railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 33,000	
Direct labor	63,600	
Manufacturing overhead*	56,500	
Total manufacturing cost		$153,100
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 15,900
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 5,000
Total annual costs		$186,000
Annual Gross Profit		$ 14,000
ANNUAL SALES REVENUE		$200,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect Labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

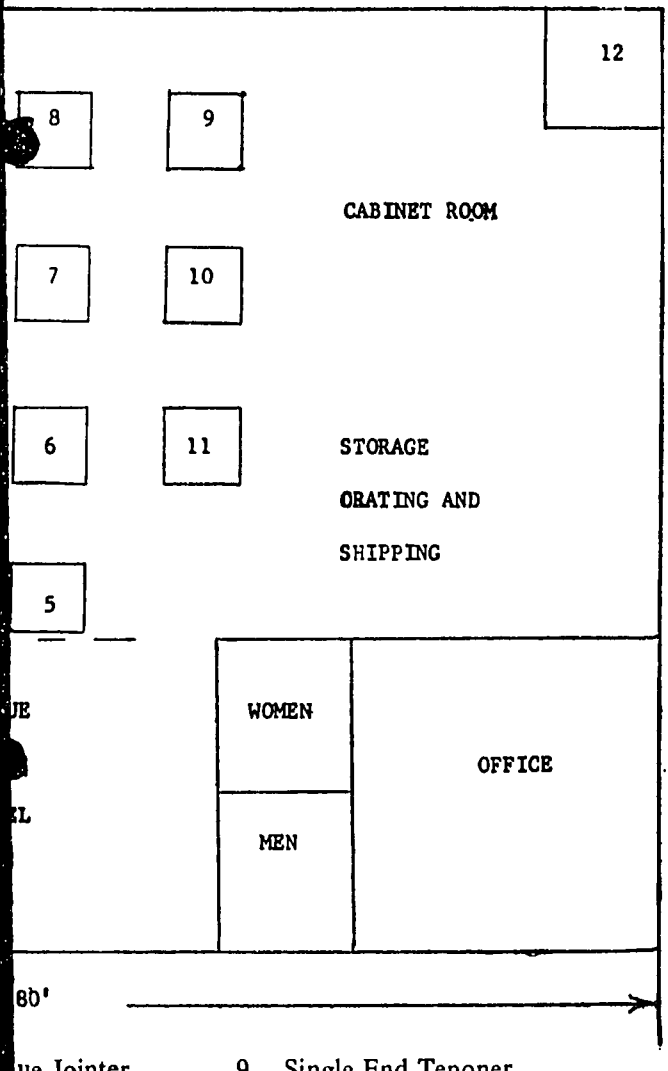


1. Radial saw
2. Jointer
3. Planer
4. Ripsaw

FURNITURE

I. P. NO. 67282
S. I. C. 2531

LAYOUT



ue Jointer
im Saw
nd Saw
rill Press

9. Single End Tenoner
10. 3 Drum Sander
11. Drum Sander
12. Soray Booth

SCHOOL FURNITURE

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Technical Woodworking. Chris H. Groneman and Everett R. Glazener. 1966. 474 pp. 1550 Illus. $6.96

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Current practices and techniques employed in the operation of modern woodworking machinery and equipment with emphasis on industrial woodworking.

B. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp. 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Complete information on basic woodworking from raw materials through finished product.

C. The Carpentry Book. Charles Hayward. 1955. 398 Illus. 454 pp. $ 5.95

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Use and care of tools in woodworking procedures covering joints, workshop practice, drawers, bookcases, furniture of all kinds and garden equipment.

II. TECHNICAL AND TRADE PERIODICALS

A. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company, Inc.
Wheaton, Illinois 60188

Devoted to coverage of industrial woodworking.

B. Furniture Manufacturer. Monthly. $3.00/year.

Vincent Edwards, Inc.
342 Madison Avenue
New York, New York 10017

Furniture components, manufacturing processes, marketing.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,233,346 February 8, 1966 5 p.
Enclosure for studying.

B. Patent No. 3,181,253 May 4, 1965 14 p.
Apparatus for novel teaching system using sight, sound and response elements.

C. Patent No. 3,117,533 January 14, 1964 3 p.
Convertible classroom furniture.

D. Patent No. 3,117,535 January 14, 1964 4 p.
Furniture for laboratory language instruction.

E. Patent No. 3,088,229 May 7, 1963 6 p.
Mobile display stand.

F. Patent No. 3,077,041 February 12, 1963 3 p.
Foldable teaching aid,

G. Patent No. 2,973,806 1961 5 p.
Process for manufacturing chairs.

H. Patent No. 2,757,715 1956 5 p.
Processes used in making chairs, particularly of the folding type.

I. Patent No. 2,688,524 1954 8 p.
Machinery, equipment, and process for manufacturing tables with drop leaf.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Furniture Manufacturers
666 Lake Shore Drive
Chicago, Illinois 60611

Keeps manufacturers informed on latest developments in machinery, materials, processes and market opportunities.

B. Furniture Manufacturers Association
103 Pearl Street, N. W.
Grand Rapids, Michigan 49502

VI. DIRECTORIES

A. Hitchcock's Woodworking Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers and suppliers of over 800 products used in the woodworking industry, as well as listing trade names, trade association, and other data.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

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The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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INDUSTRY PROFILES

DRY CLEANING, SELF-SERVICE, COIN OPERATED

I. P. No. 67283
S. I. C. 7216

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

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I.P. No. 67283
S.I.C. 7216
DECEMBER 1967

DRY CLEANING, SELF-SERVICE, COIN OPERATED

PRODUCT DESCRIPTION

Dry cleaning of clothing, bedding, draperies and other household articles using a synthetic solvent and ironing or pressing after cleaning.

A. GENERAL EVALUATION OF PROSPECTS

The plant described in this profile contains equipment for dry cleaning, ironing or pressing. Two employees are used full-time and one part-time. A clothes pressing machine and a sewing machine are provided and the employees will operate these as requested by the customers. All of the dry cleaning mechanical equipment is coin operated and the cleaning fluid is provided by the owner. In the United States, one man sometimes establishes and operates more than one of these businesses within a city. Owners usually permit companies to install soft drink and cigarette coin operated vending machines on a percentage basis.

B. MARKET ASPECTS

1. USERS

Home owners, apartment dwellers and individuals throughout the entire community.

2. SALES CHANNELS AND EXTENT OF MARKET

These businesses should be located within active shopping areas. People bring in their dry cleaning and take it away with them. Self-service dry cleaning businesses are usually set up only in urban areas, often in a rented building situated in a busy shopping center. The market for this service extends over a limited geographical area; the shop serves the population in the area surrounding the shopping center. The only competition that could be encountered would come from commercial full-service dry cleaning establishments. The cost of using the coin operated, self-service, dry cleaning shop is far less, however.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requiremens" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $26,000.
The total fixed investment, plus working capital, is estimated at $18,450.
The annual gross profit, before taxes, is estimated at $4,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 15.4%.
(A gross profit on sales, before taxes, of 15.4%, while reflecting U.S. experience should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 22.2%.

5. COST PER MAN EMPLOYED

Two direct workers and one indirect worker or a total of three workers, are employed.
The total fixed capital investment is estimated at $16,000.
Based on these figures, the fixed investment per man employed would amount to about $5,325.

C. PRODUCTION REQUIREMENTS - DRY CLEANING, SELF-SERVICE, COIN OPERATED — I.P. No. 67283 S.I.C. 7216

ANNUAL CAPACITY, OPERATING 14 HOURS PER DAY: $26,000 GROSS SALES

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - none	
Building - 20' x 70' rented, one story	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 16,000

Principal items:

8 Dry cleaning machines, coin operated
1 Clothes press
1 Sewing machine
1 Steam boiler
Tables
Scales
Cash Register

b. Working Capital (15 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 2,450
c. Total Capital Requirements	$ 18,450

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Cleaning solvent		
Spotting fluid		
Button, thread and trimmings		
Total direct materials		$ 1,500
b. Supplies		
Lubricants & hand tools		
Cutting tools & abrasives		
Maintenance & spare parts		
Office supplies		
Rent of space		
Total supplies		$ 2,500

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3 POWER, FUEL AND WATER

	Annual Cost
Electric Power - 18 H.P. connected load	
Fuel - heat as required	
Water - fire protection and sanitation	$ 1,300

4. DEPRECIATION

	Yrs. life	Amount
Building	0	
Prodn. tools & equipment	10	
Other tools & equipment	20	
Furniture & fixtures	20	
Total depreciation		$ 1,500

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Owner	1	
Total indirect labor	1	$ 8,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	0	
Unskilled workers	1	
Total direct labor	2	$ 6,000

c. Training needs

Owner or skilled worker should be fully experienced. Training should require not more than one week.

6 TRANSPORTATION

a. Own transport equipment

None required.

b. External transport facilities

Since all materials to be drycleaned are brought in and taken away by the customer, none are needed.

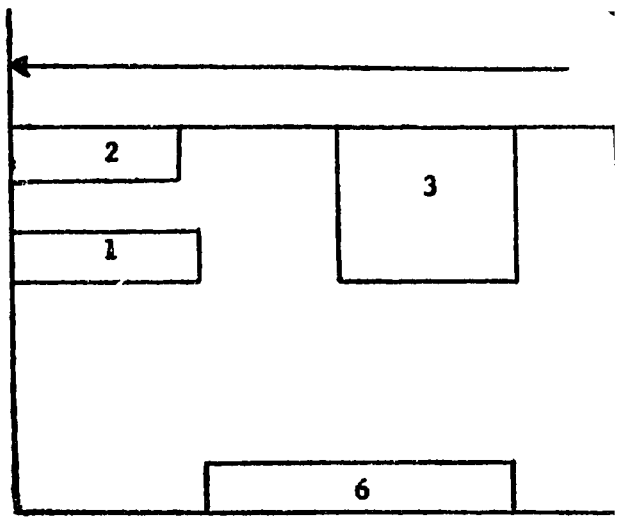
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 1,500	
Direct labor	6,000	
Manufacturing overhead*	13,300	
Total manufacturing cost		$ 20,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		1,200
Sales expense		0
Freight-out, travel discounts Allowances & bad debts		0
Total annual costs		$ 22,000
Annual Gross Profit		$ 4,000
ANNUAL SALES REVENUE		$ 26,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practica to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT

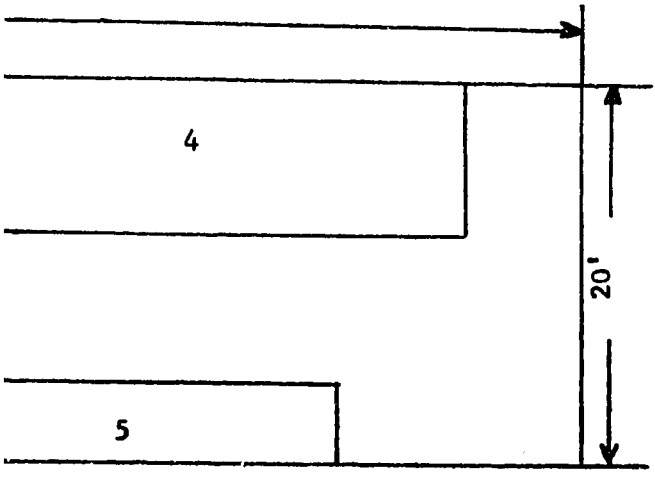


1. COUNTER & CASH REGISTER
2. SEWING MACHINE
3. PRESSING & IRONING

COIN OPERATED

I. P. NO. 67283
S. I. C. 7216

)UT



8 CLEANING MACHINES
WORK BENCH AND SCALE
CHAIRS

DRY CLEANING, SELF SERVICE, COIN OPERATED

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Dry Cleaning. E. Roland Phillip, Jr. 1961. 180 pp. Illus. $4.00

National Institute of Drycleaning
909 Burlington Avenue
Silver Spring, Maryland 20910

Comprehensive information on drycleaning of fabrics and care of equipment.

B. Applied Science for Drycleaning. George B. Fulton. Now being revised. 400 pp. Illus. $6.50

National Institute of Drycleaning
909 Burlington Avenue
Silver Spring, Maryland 20910

Chemistry of drycleaning.

C. Drycleaning. A. R. Martin and G. P. Fulton, 1958. Illus. $6.00

John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

II. TECHNICAL AND TRADE PERIODICALS

A. American Dryeleaner. Monthly. $3.00/year

American Trade Magazines
500 North Dearborn Street
Chicago, Illinois 60610

Recent news on processes, methods and operational advancement in the dry cleaning field.

B. Practical Operating Tips. Semi-monthly. Gratis to members of the Institute.

National Institute of Drycleaning
909 Burlington Avenue
Silver Spring, Maryland 20910

Provides data on spotting, finishing and all drycleaning operations.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp, 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each

A. Patent No. 3,253,431. May 1966. 5 p.
Drycleaning apparatus.

B. Patent No. 3,250,097. May 1966. 17 p.
Machines and techniques in drycleaning.

C. Patent No. 3,250,098. May 1966. 7 p.
Drycleaners fluid circuit.

D. Patent No. 3,246,493. August 1966. 13 p.
Apparatus and techniques in drycleaning.

E. Patent No. 3,236,073. February 1966. 11 p.
Coin operated drycleaning system.

F. Patent No. 2,986,918. 1961. 4 p.
Laundry and drycleaning apparatus.

G. Patent No. 2,974,514. 1961. 3 p.
Drycleaning equipment and process.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Institute of Drycleaning
909 Burlington Avenue
Silver Spring, Maryland 20910

B. Laundry and Cleaners Allied Trades Association
1180 Raymond Boulevard
Newark, New Jersey 07102

VI. DIRECTORIES

A. Laundry Industry Guidebook. Annual. $2.00

Laundry Journal
466 Lexington Avenue
New York, New York 10017

VII. PROFESSIONAL ENGINEERING SERVICES

The services of a private professional engineer are not likely to be needed to establish a self-service, coin-operated dry cleaning business. Manufacturers of dry cleaning, coin-operated equipment employ engineers and specialists familiar with the design and installation of their specialized products. These manufacturers usually give prospective customers the benefit of technical advice by their engineers or specialistis in determining the suitability of their equipment for the self-service, coin-operated dry cleaning enterprise in question.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

PLATING OF AUTOMOBILE PARTS

I. P. No. 67284
S. I. C. 3471

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

PLATING OF AUTOMOBILE PARTS

PRODUCT DESCRIPTION

Electroplating repair of automobile parts.

A. GENERAL EVALUATION OF PROSPECTS

Automobile assembly plants usually maintain their own electroplating departments, therefore, a plant of this type would have to depend on plating work derived from used cars. Such work often includes repair work on the various parts before the plating is done. Such repair work would require additional tools which are not included in this profile. This plant could do plating on products other than automobile parts and such possibilities should be investigated. The annual production capacity of this plant is 500,000 square feet of plating. It is doubtful whether this amount of replating is justifiable in some countries and a careful survey of the sales potential should, therefore, be made before setting up the plant.

B. MARKET ASPECTS

1. USERS

Owners of automobiles which require parts replated, automobile plants (if they do not have plating departments), and individuals who require replating of other items.

2. SALES CHANNELS AND EXTENT OF MARKET

Sold direct to automobile plants, used car dealers, used car owners and garages. If a local automobile assembly plant purchases its electroplating, this plant should be located near the customer. If the plating plant, on the other hand, depends on repair and replating work, the plant should be centrally located with reference to car owners. While some parts such as bumpers are bulky, the shipment of such large parts for repair would comprise only a few pieces. If good transportation exists, the domestic market could be nationwide. Unless other plating plants exist within the country, no competition can be expected. This plant could not enter the export market. The local market size will depend on the existence of an automobile assembly plant, on the number of motor vehicles in use and on the amount of other plating work that can be obtained.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $350,000.
The total fixed investment, plus working capital, is estimated at $198,800.
The annual gross profit, before taxes, is estimated at $45,000.
Using these figures, the profit on gross sales, before taxes, amounts to 12.9%.
(A gross profit on sales, before taxes, of 12.9%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 22.5%.

5. COST PER MAN EMPLOYED

Twenty direct and eight indirect workers, or a total of twenty-eight workers are employed.
The total fixed capital investment is estimated at $141,000.
Based on these figures, the fixed investment per man employed would amount to $5,025.

C. PRODUCTION REQUIREMENTS - PLATING OF AUTOMOBILE PARTS — I.P. No. 67284
ANNUAL CAPACITY - ONE SHIFT OPERATION : — S.I.C. 3471
500,000 SQUARE FEET OF SURFACE PLATED

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRICTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - one acre	
Building - one-story, 80' x 100'. Concrete block construction. Acid proof floors,	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation & equipment	
Total fixed capital	$ 141,000

Principal items ;

3 plating rectifiers	Filter pump
Anondizing rectifiers	Delivery trucks
4 polishing and buffing lathes	Monorail conveyor
Tanks	
Piping	
Electrical bus system	
2 drying ovens	
Steam boiler	
Laboratory equipment	
Lift truck	
Compressor	
Transfer pump	

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 57,800

c. Total Capital Requirements $ 198,800

2. MATERIAL AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Copper anodes	11 tons	
Nickel anodes	7 tons	
Chromic acid	4 tons	
Copper plating salts	5 tons	
Nickle plating salts	6.5 tons	
Sodium cyanide	5 tons	
Other chemicals	10 tons	
Polishing and buffing compounds	15 tons	
Total direct materials		$ 54,200

b. Supplies

Lubricants & hand tools	
Cutting tools and abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil & maintenance of truck	
Total supplies	$ 7,100

c. Availability of materials & supplies

Some of the chemicals may have to be imported.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 200 H.P. connected load.	
Fuel - for steam boiler and heat 60,000 gallons of oil	
Water - 60,000,000 gallons for production, boiler, cooling, fire protection and sanitation	$ 14,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	6	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 13,500

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Maintenance	2	
Truck drivers	2	
Total indirect labour	8	$ 56,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	6	
Unskilled workers	12	
Total direct labor	20	$ 87,200

c. Training needs

Manager should be fully experienced. He and two skilled workers should be able to train workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

Two trucks.

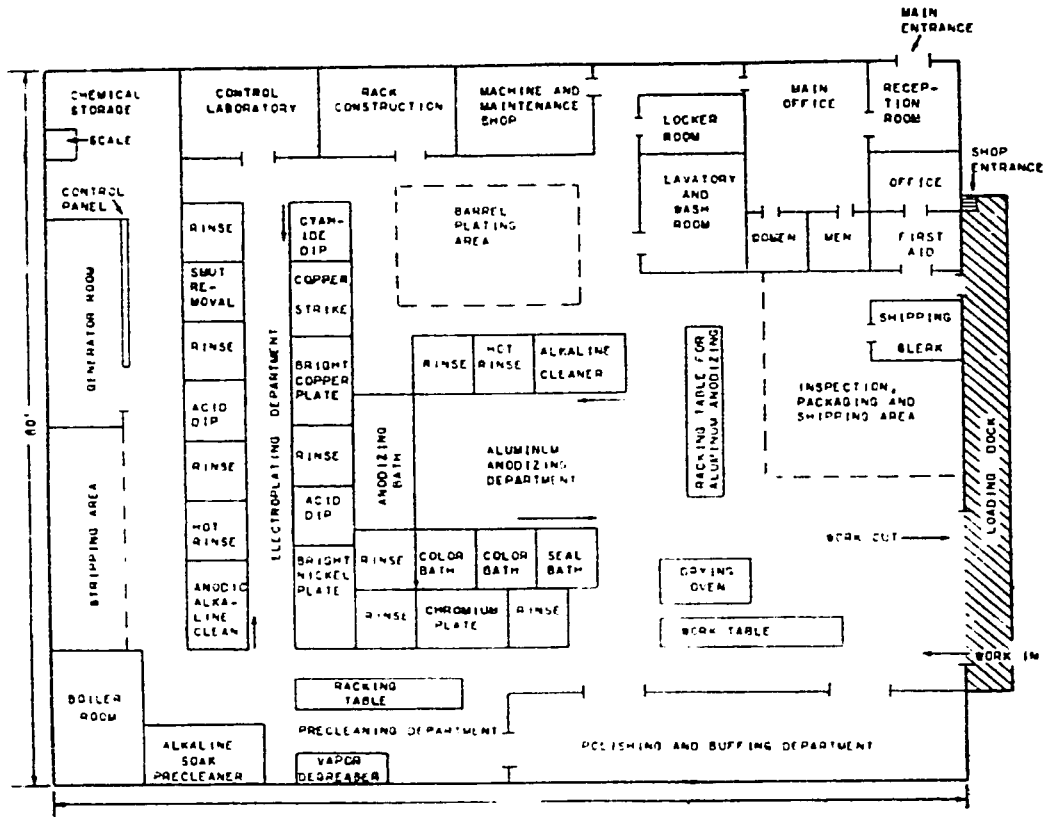
b. External transport facilities

These products are bulky.
Good highways. Railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 54,200	
Direct labor	87,200	
Manufacturing overhead*	90,600	
Total manufacturing cost		$ 232,000
Interest on loans		
Insurance		
Legal		
Audit		
Contigencies		
Total admistrative cost		$ 28,000
Sales expense		$ 34,500
Freight-out, travel discounts Allowances & bad debts		$ 10,500
Total annual costs		$ 305,000
Annual Gross Profit		$ 45,000
ANNUAL SALES REVENUE		$ 350,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

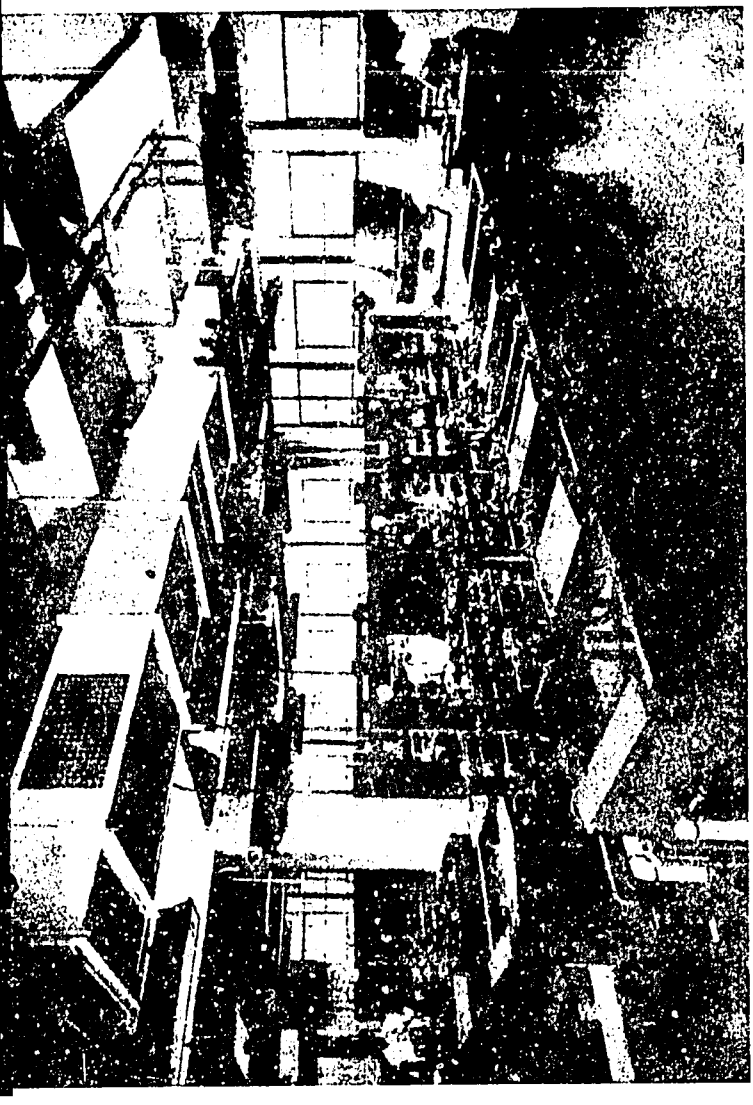


NOTE : PROCESSING TANKS NOT TO SCALE

Plating Plant

PLATING OF A

I. P. NO. 67284
S. I. C. 3471



Plating Tank Layout

I.P. No. 67284
S.I.C. 3471

PLATING OF AUTOMOBILE PARTS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Modern Electroplating. Frederick A. Lowenheim. 2nd Edition. Illus. 769 pp. $17.50

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

General principles, materials, processes, and methods of control.

B. Electroplating Engineering Handbook. A. K. Graham. 2nd Edition. 650 pp. $22.00

Reinhold Publishing Corporation
430 Park Avenue
New York, New York 10022

Typical processing and operating sequences, plating, and metal finishing costs.

II. TECHNICAL AND TRADE PERIODICALS

A. Plating. Monthly. $10.00/year.

American Electroplaters' Society, Inc.
56 Melmore Gardens
East Orange, New Jersey 07017

Devoted to the advencement of metal finishing, electroplating, and allied arts.

B. Metal Finishing. Monthly. $5.00/year.

Metals and Plastics Publications, Inc.
99 Kinderkamack Road
Westwood, New Jersey 07675

Plating of metals, as well as other finishing processes and methods.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small ousinessmen understand past decisions and to make better decisions in the future.

C. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C 20231. $.50 each.

A.	Patent No. 3,244,554. Metal alloy plating process.	April 5, 1966.	8 p.
B.	Patent No. 3,178,311. Improved electroless plating process.	April 13, 1965.	2 p.
C.	Patent No. 3,155,532. Metal plating process.	November 3, 1964.	2 p.
D.	Patent No. 3,133,035. Metal plating procedure.	December 3, 1963.	2 p.
E.	Patent No. 3,106,484. Metal treating.	October 8, 1963.	6 p.
F.	Patent No. 3,066,044. Process and apparatus for chromizing iron and steel parts.	November 27, 1962.	4 p.
G.	Patent No. 3,065,108. Coating of a dissimilar base.	November 20, 1962.	4 p.
H.	Patent No. 3,028,261. Chromizing metals.	April 3, 1962.	4 p.
I.	Patent No. 3,069,333. Chromium plating.	December 18, 1962.	7 p.
J.	Patent No. 2,941,929. Electrolytes for forming films on metal.	1960.	10 p.
K.	Patent No. 2,899, 367. Method of preparing surfaces for electroplating.	1959.	5 p.
L.	Patent No. 2,888, 387. Process for electroplating.	1959.	2 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Electroplaters' Society
56 Melmore Gardens
East Orange, New Jersey 07017

VI. DIRECTORIES

A. Metal Finishing Guidebook Directory. Annual. $5.00

Metal and Plastics Publications, Inc.
99 Kinderkamack Road
Westwood, New Jersey 07675

Lists all suppliers and manufacturers in the metal finishing field.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small. A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines. They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Springfield, Virginia 22151

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GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

CONCRETE POSTS

I. P. No. 67285
S. I. C. 3272

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

CONCRETE POSTS

I. P. No. 67285
S. I. C. 3272
DECEMBER 1967

PRODUCT DESCRIPTION

Fence posts, lamp posts, porch columns and any other type of post made from concrete.

A. GENERAL EVALUATION OF PROSPECTS

These products are intended to take the place of wooden and metal fince posts where wood is not available locally for fence posts and where concrete posts are cheaper than wood or metal or where they are better suited to local conditions due to erosion.

B. MARKET ASPECTS

1. USERS

These products would be used on farms and building lots and also along railroads and highways.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales will usually be made to retailers for distribution to small users and direct to large users such as railroads and highway departments. Normally, concrete posts would be used in both urban and rural areas. While the product is bulky and heavy, the cost of transportation should not be prohibitive in relation to its selling price. If good highways exist, the product can be distributed nationally. If suitable lumber is available at low cost, competion from wooden post producers would be very keen but if lumber is scarce, no domestic competition should exist. Due to the weight, bulk and cost of shipping concrete posts, there will be no competition from imports. Concrete posts are not an export item.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $365,000.
The total fixed investment, plus working capital, is estimated at $225,300.
The annual gross profit, before taxes, is estimated at $35,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.6%.
(A gross profit on sales, before taxes, of 9.6%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 15.5%.

5. COST PER MAN EMPLOYED

Twenty-four direct and eight indirect workers, or a total of thirty-two workers, are employed.
The total fixed capital investment is estimated at $157,000.
Based on these figures, the fixed investment per man employed would amount to about $4,900.

C. PRODUCTION REQUIREMENTS - CONCRETE POSTS — I.P. No. 67285
ANNUAL CAPACITY - ONE SHIFT OPERATION: 150,000 POSTS — S.I.C. 3272
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - about two acres	
Building - one-story, 75' x 160'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 157,000

Principal items :

3 mixing machines with motor
8 tilt tables with lamp
8 vibrating hammers
1,000 wooden pallets
3 wheelbarrows
3 concrete buggies
1 acetylene welding equipment
1 delivery truck
1 fork lift truck

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 68,300
c Total Capital Reqeirements	$ 225,300

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Portland cement	2,000 tons	
Coarse aggregate	6,000 tons	
Sand	4,000 tons	
3/8'' reinforcing rods	60 tons	
Total direct materials		$ 72,000

b. Supplies

Lubricants & hand tools
Cutting tools & abrasives
Maintenance & spare parts
Office supplies
Gas, oil & maintenance of truck

Total supplies $ 3,900

c. Availability of materials & supplies

All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 70,000 K.W.H.	
Fuel - heating and sanitation	
Water - production heating and sanitation	$ 2,500

4. DEPRECITION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 12,800

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager and foreman	2	
Office receiving & shipping	3	
Maintenance	1	
Truck driver & helper	2	
Total indirect labor	8	$ 51,000
b. Direct labor		
Skilled workers	8	
Semi-skilled workers	12	
Unskilled workers	4	
Total direct labor	24	$ 124,000

c. Training needs

Manager and foreman should be fully experienced. They should be able to train all workers and reach full production in 2 weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck.

b. External transport facilities

In and out shipment 80 tons per day.

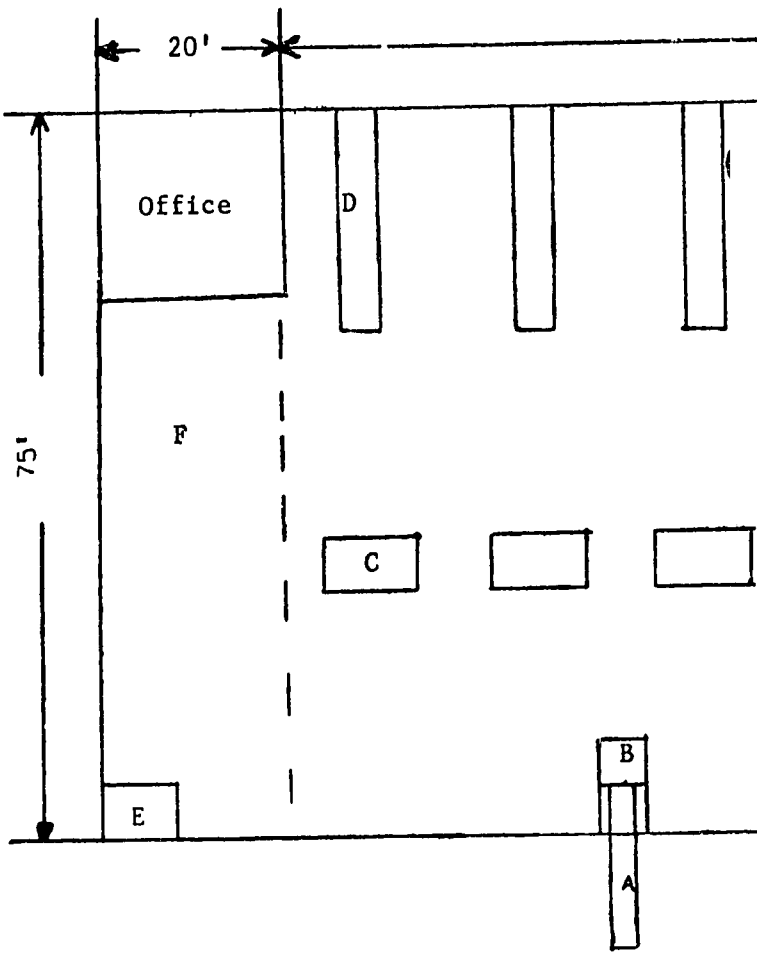
Plant should be located on a good highway and on a railroad, if possible.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 72,000	
Direct labor	124,000	
Manufacturing overhead*	70,200	
Total manufacturing cost		$ 266,200
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 33,800
Sales expense		$ 18,000
Freight-out, trevel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 330,000
Annual Gross Profit		$ 35,000
ANNUAL SALES REVENUE		S 365,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

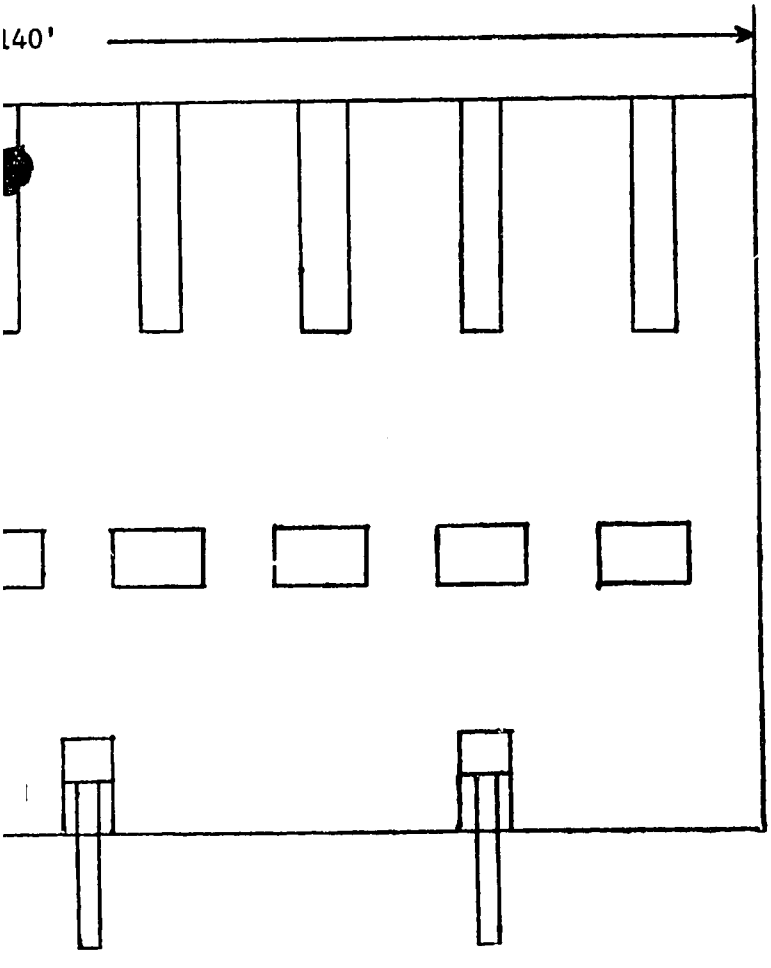
STORAGE YARD FO



A - 3 Ramps to Concrete Mixer
B - 3 Concrete Mixers
C - 8 Tilt Tables
D - 8 Skids for Fence Posts

I. P. NO. 67285
S. I. C. 3272

NISHED PRODUCTS



E - 1 Air Compressor
F - Storage for metal forms
Maintenance Department

CONCRETE POSTS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Simplified Designs of Reinforced Concrete. Harry Parker. 2nd Edition. 1960. 303 pp. Illus. $6.50

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Provides basic, practical information in the field of mechanics and strength of materials without the use of advanced mathematics.

B. Reinforced Concrete. J. Faber and F. Mead. 1961. 2nd Edition. Illus. $14.75

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

C. Composition and Properties of Concrete. Troxell & Davis. 1956. 434 pp. Illus. $9.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Principles of concrete making. The nature of the problems. Concrete making materials. Proportioning of concrete mixes.

D. Design and Control of Concrete Mix. No price given.

Portland Cement Association
33 West Grand Avenue
Chicago, Illinois 60610

II. TECHNICAL AND TRADE PERIODICALS

A. Modern Concrete. Monthly. $2.00/year.

Pit and Quarry Publications, Inc.
431 South Dearborn Street
Chicago, Illinois 60605

Devoted to the concrete industry.

B. Concrete Products. $4.00/year.

MacLean-Hunter Publishing Corporation
300 West Adams Street
Chicago, Illinois 60606

Deals with progress and development in the concrete industry.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each

A. Patent No. 3,227,785 January 1966 3 p.
Method of casting concrete.

B. Patent No. 3,217,075 November 1965 5 p.
Method for making stressed lightweight concrete products.

C. Patent No. 3,202,737 August 1965 5 p.
Method of manufacturing pressed concrete.

D. Patent No. 3,202,398 August 1965 3 p.
Prestressing means for slat casting forms.

E. Patent No. 3,055,073 September 1962 4 p.
Method and apparatus for the continuous production of prestressed concrete members.

F. Patent No. 3,034,192 May 1962 4 p.
Method and apparatus for making concrete articles.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Concrete Institute
22400 West Seven Mile Road
Detroit, Michigan 48219

Provides news and technical information to members, who include contractors and technical experts.

B. Prestressed Concrete Institute
205 West Wacker Drive
Chicago, Illinois 60606

VI. DIRECTORIES

A. American Concrete Industry Directory. $5.00

American Concrete Institute
P. O. Box 4754, Redford Station
Detroit, Michigan 48219

Lists 18,588 engineers, architects, scientists, builders, manufacturers, of industries in the field of concrete.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

READY-MIXED CONCRETE IN BAGS

I. P. No. 67286
S. I. C. 3273

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

READY-MIXED CONCRETE IN BAGS

I.P. No. 67286
S.I.C. 3273
DECEMBER 1967

PRODUCT DESCRIPTION

Portland cement, sand and gravel mixed and bagged, ready for concrete work by adding water.

A. GENERAL EVALUATION OF PROSPECTS

Concrete is used world-wide. Mixing concrete in small lots is a difficult task for the average person and many people do not know how to mix concrete. Ready-mixed concrete in bags fills a need in any country. The available sales volume should be determined by a survey.

B. MARKET ASPECTS

1. USERS

Builders of buildings, roads, streets, sidewalks, foundations and repair of all concrete construction.

2. SALES CHANNELS AND EXTENT OF MARKET

Large construction contractors usually mix their own concrete. Therefore, this plant would sell to stores that sell building materials, the natural outlet for this product. Since ready-mixed concrete in bags is used principally on small construction and repair work, the potential market can only be determined by a sales survey. The product is well-packaged and can be transported easily to any part of the country where good roads exist. The investment required in production of this product prohibits all other forms of domestic competition except for a similar commercial plant. A plant of this capacity could not compete in the export market. However, it should experience no difficulty in competing with imported products.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $100,000.
The total fixed investment, plus working capital, is estimated at $106,300.
The annual gross profit, before taxes, is estimated at $9,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 9.0%.
(A gross profit on sales, before taxes, of 9.0%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 8.5%.

5. COST PER MAN EMPLOYED

Four direct and three indirect workers, or a total of seven workers, are employed.
The total fixed capital investment is estimated at $89,000.
Based on these figures, the fixed investment per man employed would amount to about $12,700.

C. PRODUCTION REQUIREMENTS READY-MIXED CONCRETE IN BAGS I.P.No. 67286
ANNUAL CAPACITY - ONE SHIFT OPERATION: 3,600 TONS S.I.C. 3273

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 1 acres	
Building - 50'x80' includes silo	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 89,000

Principal items:
Conveyors, Elevators, Heater, Batcher (Hopper and Mixes), Bag Batcher and Scales, Bagging Machine, Platform Scales, Maintenance Tools, Testing Equipment, Delivery Truck, Platform Lift-Trucks, 500 Pallets

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 17,300

c. Total Capital Requirements $ 106,300

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Portland cement	510 tons	
Sand	1,030 tons	
Gravel	2,060 tons	
Bags	90,000	
Total direct materials		$ 19,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 4,050

c. Availability of materials & supplies
All material and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 50 H.P.	
Fuel - Gas	
Water - Sanitation, and fire protection	$ 2,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 7,750

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Office	1	
Truck Driver	1	
Total indirect labor	3	$ 21,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	1	
Unskilled workers	2	
Total direct labor	4	$ 19,000

c. Training Needs
The manager must be fully experienced. He and one skilled worker should be able to train all workers and reach full production in two weeks.

6. TRANSPORTATION

a. Own transport equipment
Truck

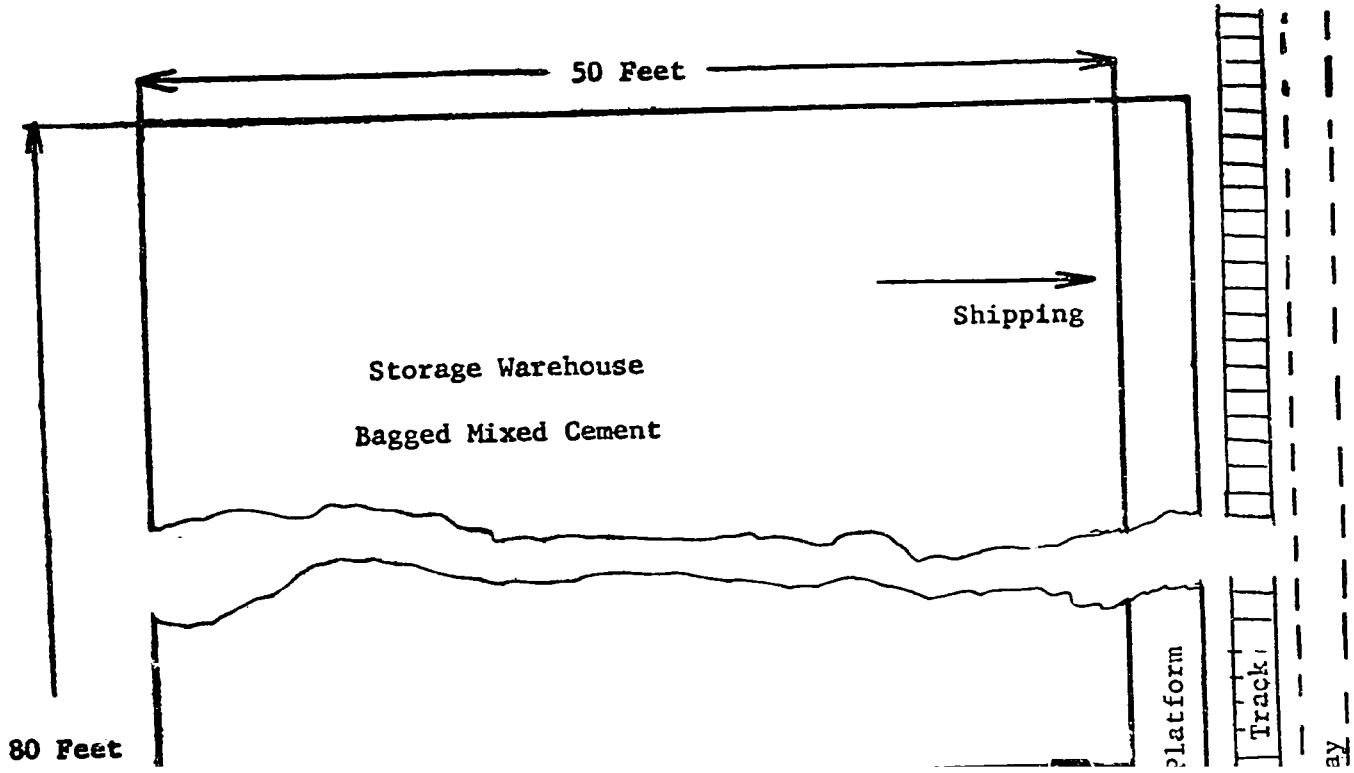
b. External transport facilities
In and out shipments about 30 tons per day. Good highway and railroad systems.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 19,000	
Direct labor	19,000	
Manufacturing overhead*	34,800	
Total manufacturing cost		$ 72,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 8,200
Sales expense		6,000
Freight-out, travel discounts Allowances & bad debts		$ 4,000
Total annual costs		$ 91,000
Annual Gross Profit		$ 9,000
ANNUAL SALES REVENUE		$ 100,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYOUT AND WORKFLOW



ETE IN BAGS

I. P. NO. 67286
S. I. C. 3273

I.P. No. 67286
S.I.C. 3273

READY-MIXED CONCRETE IN BAGS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Composition and Properties of Concrete. George Earl Troxell & Hamus E. Kavis. 434 pp. 108 Illus. 1956. $9.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Designed as a guide in a comprehensive course in the study of plain concrete.

B. Formwork and Concrete Structures. R. L. Peurifory. 1964. 330 pp. 216 Illus. $12.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Presents the methods and materials essential to the use of concrete.

C. Design and Control of Concrete Mixtures. No price given.

Portland Cement Association
33 West Grand Avenue
Chicago, Illinois 60610

II. TECHNICAL AND TRADE PERIODICALS

A. Rock Products. Monthly. $3.00/year.

MacLean-Hunter Publishing Corporation
79 West Monroe Street
Chicago, Illinois 60603

B. Modern Concrete. Monthly. $2.00/year.

Pit and Quarry Publications, Inc.
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III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

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U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,233,973. February 8, 1966 29 p.
Apparatus and method for processing Portland Cement.

B. Patent No. 3,127,455. March 31, 1964 5 p.
Method for making cement.

C. Patent No. 2,860,061. November 11, 1958 2 p.
Composition and process for manufacturing cement.

D. Patent No. 3,149,673. July 13, 1965 3 p.
Hydraulic cement and process for making same.

E. Patent No. 3,135,681. June 2, 1964 3 p.
Process for producing cement using pretreated oil shale.

F. Patent No. 3,043,703. July 10,1962 5 p.
Method for production of hydraulic cement.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Concrete Institute
22400 West Seven Mile Road
Detroit, Michigan 48219

B. National Ready Mixed Concrete Association
900 Spring Street
Silver Spring, Maryland 20910

VI. DIRECTORIES

A. American Concrete Industry Directory. $5.00. Available only to members.

American Concrete Institute
P. O. Box 4754 Redford Station
Detroit, Michigan 48219

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2029 K Street, N. W.
Washington, D. C. 20006

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for Internationa velopment by International Development Services Inc., Washington, D. C.

OXYGEN AND ACETYLENE BOTTLED

I. P. No. 67287
S. I. C. 2813

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

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OXYGEN AND ACETYLENE, BOTTLED

I.P. No. 67287
S.I C. 2813
DECEMBER 1967

PRODUCT DESCRIPTION

Oxygen and acetylene delivered in bottles. The volume of gas per bottle or cylinder is 244 cubic feet for oxygen and 194 cubic feet for acetylene.

A. GENERAL EVALUATION OF PROSPECTS

The estimated total capital requirements are fairly moderate in comparison with the annual gross sales and, in comparison, with the annual gross profits before taxes. The prospects for this industry will depend on the sales potential for these products within the country. The products are used for the welding and cutting of metals. If the demand for oxygen and acetylene is equal to the production capacity of this plant, the prospects for this factory should be excellent.

B. MARKET ASPECTS

1. USERS

These products would be used principally by industries, public works, railroads, the military, contractors, repair shops, garages and wherever else the welding and cutting of metals with gas are required.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made to wholesalers for distribution to small users. Large users, such as public works projects, large industries and railroads would purchase directly from the plant. The market for these products cannot be measured in terms of population. The market depends on the use of the products listed under Users (B. 1.) above, and the possibility of making some sales in nearby countries. A comprehensive survey should be undertaken to determine this industry's potential. The product is bulky and heavy and not easily handled. Many United States producers maintain their own distribution system. Sales will normally be made in urban areas, however, the value of the products would permit shipment on a nation-wide basis, including the return of empty bottles. This industry cannot operate on a small-volume basis. Unless other plants producing these products already exist in the country, no domestic competition will result. A plant of the capacity proposed here could not hope to compete in world markets.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to costs and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $720,000.
The total fixed investment, plus working capital, is estimated at $248,700.
The annual gross profit, before taxes, is estimated at $98,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 13.6%.
(A gross profit on sales, before taxes, of 13.6%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 39.5%.

5. COST PER MAN EMPLOYED

Twelve direct workers and eight indirect workers, or a total of twenty workers, are employed.
The total fixed capital investment is estimated at $124,000.
Based on these figures, the fixed investment per man employed would amount to $6,200.

C. PRODUCTION REQUIREMENTS - OXYGEN AND ACETYLENE BOTTLED

ANNUAL CAPACITY - THREE SHIFT OPERATION, SIX DAYS PER WEEK, FIFTY WEEKS PER YEAR: 45,000 BOTTLES OF OXYGEN AND 45,000 BOTTLES OF ACETYLENE

I.P. No. 67287
S.I.C. 2831

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - one acre	
Building - 2 one-story fireproof buildings. Total area 6,000 square feet.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 124,000

Principal items:

Oxygen equipment
Acetylene generator
Acetylene compressor
Vacuum pump
Manifolds
Wiring
Piping
Sludge pits

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 124,700
c. Total Capital Requirements	$ 248,700

2 MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Calcium carbide	1,939.800 lbs	
Acetone	146,000 lbs.	
Activated alumina	2,000 lbs.	
Caustic soda	14,400 lbs.	
Bottles or cylinders		
Total direct materials		$ 382,300

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance of truck	
Total supplies	$ 3,400

c. Availability of materials & supplies

Some materials may have to be imported. Supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 150 H.P. connected load	
Fuel - heating	
Water - 1,940,000 gallons for production sanitation, and fire protection	$ 10,700

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 11,400

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Office	2	
Maintenance	3	
Truck Driver & helper	2	
Total indirect labor	8	$ 48,000
b. Direct Labor		
Skilled workers	6	
Semi-skilled workers	3	
Unskilled workers	3	
Total direct labor	12	$ 69,000

c. Training needs

Manager must be fully experienced. He and the six skilled workers should be able to train other workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

One delivery truck

b. External transport facilities

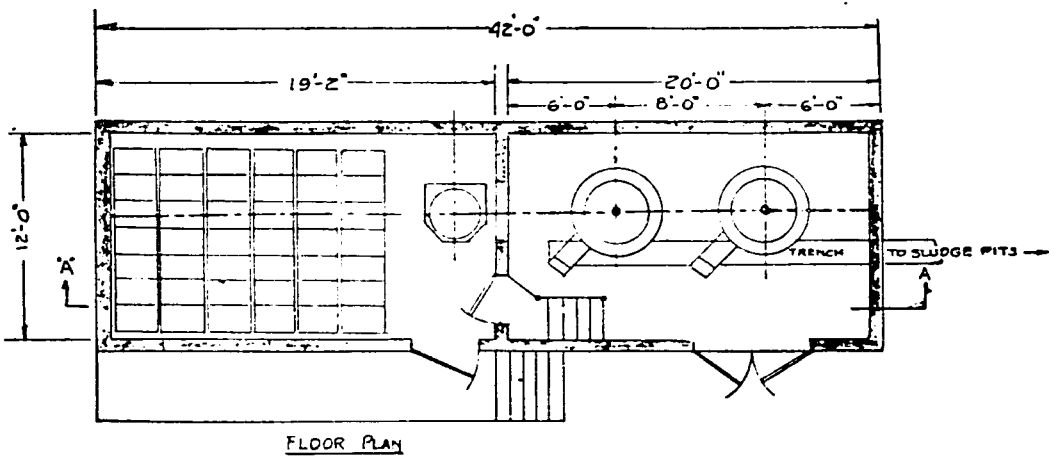
Good highways are essential and good railroad facilities should be available.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 382,300	
Direct labor	69,000	
Manufacturing overhead*	73,500	
Total manufacturing cost		$524,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 49,200
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$622,000
Annual Gross Profit		$ 98,000
ANNUAL SALES REVENUE		$720,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.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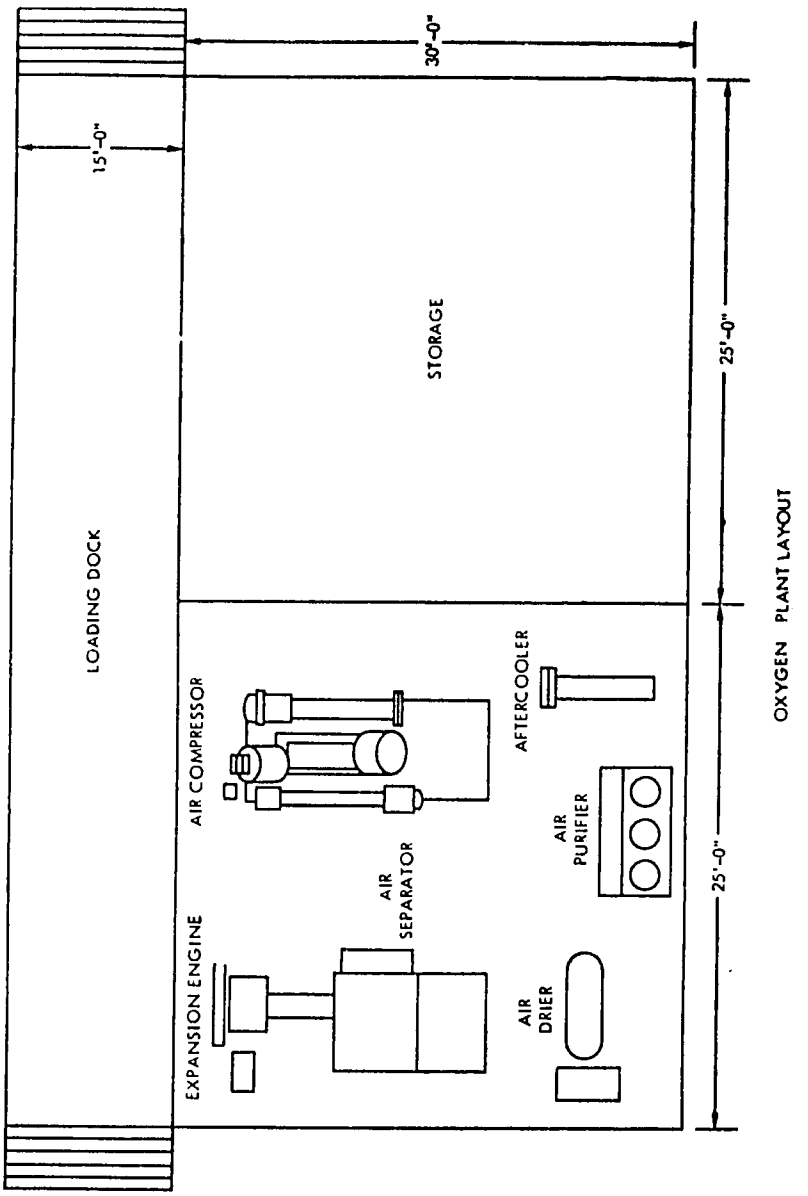
19'-2"
20'-0"
6'-0"
8'-0"
6'-0"
12'-0"
A
A
TRENCH
TO SLUDGE PITS
FLOOR PLAN
MONORAIL
CARBIDE STORAGE
CHARGING HOPPER PIT

OXYGEN AND

ENE BOTTLED

I. P. NO. 67287
S. I. C. 2813



OXYGEN AND ACETYLENE BOTTLED

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Industrial Chemistry. 5th Edition. E. R. Riegel. 1949. 1,020 pp. Illus. $20.00

Reinhold Publishing Corporation
430 Park Avenue
New York, New York 10022

Includes information on oxygen and acetylene.

B. High Pressure Technology. E. W. Comings. 1956. 297 pp. Illus. $16.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Covers the whole field of high pressure technology.

II. TECHNICAL AND TRADE PERIODICALS

A. Chemical Engineering. Bi-weekly. $3.00/year.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Intended for engineers and technical management in chemical process industries.

B. Chemical Week. Weekly. $5.00/year.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Devoted to chemical processing industry.

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth and decline.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

C. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

IV. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,241,328 May 1966 5 p.
Cylinder loading with liquifiable gases.

B. Patent No. 3,144,316 August 1966 10 p.
Process and apparatus for liquifying low boiling gases.

C. Patent No. 3,054,269 September 1962 4 p.
Liquification of a gas with the aid of a high speed turbo compressor.

D. Patent No. 2,975,604 March 1964 6 p.
Method of distribution of a condensable gas.

E. Patent No. 2,973,805 1961 3 p.
Process for the safe storing of liquid acetylene.

F. Patent No. 2,925,387 1960 4 p.
Process for the storing and handling of acetylene.

G. Patent No. 2,662,379 1953 3 p.
Storage device for liquified gases.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Independent Oxygen Manufacturers Association
P.O. Box 1260
Albany, Georgia 31702

B. International Acetylene Association
270 Park Avenue
New York, New York 10017

C. Compressed Gas Association
500 Fifth Avenue
New York, New York 10036

Concerned with safety activities and technical activities of compressed gas industries.

VI. DIRECTORIES

A. Consulting Engineers and Construction Firms Serving the Chemical Industry. Free.

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Lists 400 consulting engineers and consulting firms serving the chemical industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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They may also be reached through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

COCOA BUTTER

I. P. No. 67288
S. I. C. 2072

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

COCOA BUTTER

PRODUCT DESCRIPTION

Cocoa butter is a yellowish-white low melting fat removed by pressure from cured and roasted cocoa beans. It retains a chocolate-like odor and taste.

A. GENERAL EVALUATION OF PROSPECTS

The cocoa butter industry is old and well established. Manufacturing methods have been improved over the years so that, today, very few people are needed to operate a cocoa butter plant. In countries where pastries and confections are not generally consumed by the local population, a survey should be conducted to determine the market potential. If an adequate sales volume exists and other factors are favorable, the prospects for this industry should be excellent.

B. MARKET ASPECTS

1. USERS

Cocoa butter is used in the manufacture of chocolate candy and other confections and by bakeries, restaurants, hotels, private homes and wherever food is prepared. The product is also used in the preparation of fine soaps and cosmetics and medicinally as an emollient.

2. SALES CHANNELS AND METHODS

Sales would be made direct to large industrial users and to wholesalers for distribution to retail stores. With adequate management this plant should be able to compete against similar plants within the domestic market. Its low-cost production capability should allow it to compete in the export market which extends world-wide. Cocoa butter is well packaged and is not bulky, making shipment easy and economical.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $1,100,000.
The total fixed investment, plus working capital, is estimated at $411,700.
The annual gross profit, before taxes, is estimated at $143,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 13%.
(A gross profit on sales, before taxes, of 13%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 34.7%.

5. COST PER MAN EMPLOYED

Five direct workers and six indirect workers or a total of eleven workers are employed.
The total fixed capital investment is estimated at $252,000.
Based on these figures, the fixed investment per man employed would amount to about $ 22,910.

C. PRODUCTION REQUIREMENTS COCOA BUTTER I.P. No. 67288
ANNUAL CAPACITY - ONE SHIFT OPERATION: COCOA BUTTER: 1,300,000 POUNDS S.I.C. 2072
ANNUAL CAPACITY - BY-PRODUCT COCOA POWDER: 1,900,000 POUNDS
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 5 acres	
Building - 50' x 100' one story	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 252,000

Principal items:
Cleaning Machine
Roaster
Cracking and Fanning Machine
Grinder
Press
Molding Machine
Conveyor System

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 159,700
c. Total Capital Requirements	$ 411,700

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Cocoa Beans	4,000,000 lbs.	
Packaging		
Total direct materials		$ 753,000

b. Supplies	
Lubricants & hand tools	
Gas, oil and maintenance for truck	
Maintenance & spare parts	
Office supplies	
Total supplies	$ 5,400

c. Availability of materials & supplies
Materials are grown in tropical countries. Supplies are standard and available worldwide.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - About 200 H.P. connected load	
Fuel - Production and heat	
Water - Production and sanitation	
	$ 3,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 37,600

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	1	
Unskilled workers	4	
Total direct labor	6	$ 27,000

c. Training needs
The manager should be fully experienced. He and the skilled worker should be able to train the help and reach full production in two weeks.

6. TRANSPORTATION

a. Own Transport equipment
Truck

b. External transport facilities
In and out shipments 18 tons per day.
Good highways and railroad needed.

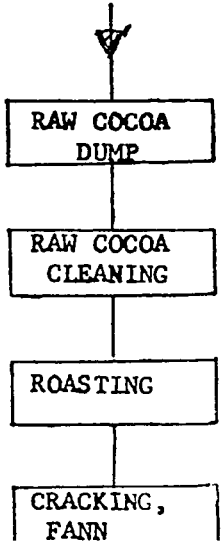
7. TOTAL ANNUAL COSTS AND SALES REVENUE

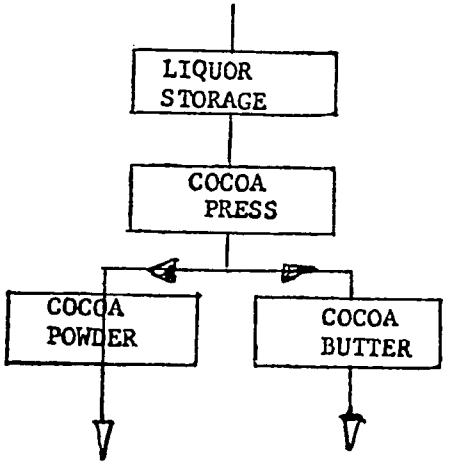
Direct materials	$ 753,000	
Direct labor	27,000	
Manufacturing overhead*	83,000	
Total manufacturing cost		$ 863,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 46,000
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$1,957,000
Annual Gross Profit		$ 143,000
ANNUAL SALES REVENUE		$1,100,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

COCOA BUTTER

FLOW SHEET SHOWING SEQUENCE OF OPERATIONS





PACKAGING

STORAGE

SHIPPING

I.P. NO. 67288
S.I.C. 2072

I. P. No. 67288
S.I.C. 2072

COCOA BUTTER

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Chocolate Production and Use. L. Russell Cook. $15.00

Catalog and Book Division
Magazines for Industry
660 Madison Avenue
New York, New York 10020

B. All About Candy and Chocolate. Phillip P. Gott and L. F. Van Hunter. 1958. 208 pp. Illus. $4.50

National Confectioners Association
36 South Wabash Avenue
Chicago, Illinois 60603

The cocoa bean from farm to market. Includes production of cocoa butter and cocoa powder.

C. Story of Chocolate. 1967. Gratis.

Chocolate Manufacturers Association of America
1812 K Street, N.W.
Washington, D.C. 20006

Contains comprehensive data relative to the chocolate industry.

II. TECHNICAL AND TRADE PERIODICALS

A. Cocoa Statistics, Quarterly. $2.50/year

Food and Agriculture Organization
United Nations
Columbia University Press
International Documents Service
2960 Broadway
New York, New York 10027

Contains data on trade and consumption, international marketing and statistical tables.

B. Candy Industry. Monthly. $7.00/year, outside U.S.

Candy Industry
777 Third Avenue
New York, New York 10017

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D.C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

How to move materials through the shop economically and efficiently.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

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IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 2,936,238 May 1960 7 p.
Manufacture of hard butter.

B. Patent No. 2,783,151 February 1957 4 p.
Process for preparing hard butter.

C. Patent No. 2,726,158 December 1955 13 p.
Hard butter and the process therefor.

D. Patent No. 2,685,592 August 1954 3 p.
Method of making hard butter.

E. Patent No. 2,667,481 January 1954 2 p.
Hard butter composition glyceride oils.

F. Patent No. 2,468,799 May 1949 6 p.
Hydrogenating fat.

G. Patent No. 2,448,979 October 1949 9 p.
Method of modifying glyceride oils.

H. Patent No. 2,456,691 December 1948 6 p.
Process of treating fatty materials.

I. Patent No. 2,442,535 June 1948 6 p.
Modification of glycerides.

J. Patent No. 2,442,532 June 1948 14 p.
Treatment of glycerides.

K. Patent No. 2,310,225 November 1939 4 p.
Method of raising melting points of natural fats and oils.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Association of Manufacturers of Confectionery and Chocolate
Suite 306, 527 Madison Avenue
New York, New York 10022

B. New York Cocoa Exchange
92 Beaver Street
New York, New York 10005

VI. DIRECTORIES

A. International Confectioner Buying Guide. Annually. $5.00

Manufacturing Confectionery Publishing Company
1031 South Boulevard
Oak Park, Illinois 60302

Lists all major wholesale candy manufacturers with full information on brands and products.

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WOODEN HANDLES

I. P. No. 67289
S. I. C. 2499

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I. P. NO. 67289
S.I.C. 2499
DECEMBER 1967

WOODEN HANDLES

PRODUCT DESCRIPTION

Wooden handles for such hand tools and implements as hoes, rakes, shovels, spades, forks, brooms, mops, hammers, axes, hatchets, malls, sledges, picks, wood chisels and small garden tools.

A. GENERAL EVALUATION OF PROSPECTS

It is important that the lumber for these products be readily available. The lumber should be equal to number one common ash. The total capital requirements are relatively low for this industry in comparison with the gross annual sales and the gross profits before taxes. If an adequate supply of suitable lumber is available locally and the annual sales potential amounts to at least 250,000 handles, this industry should represent a good investment.

B. MARKET ASPECTS

1. USERS

These products would be used by gardeners, farmers, contractors, lumber businesses, builders, landscapers various industries and government agencies.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made directly to industries manufacturing hand tools and to hardware wholesalers for resale to hardware stores and department stores. These products are widely used in both rural and urban areas and if there is an industry within the country that produces hand tools requiring wooden handles, it should be able to consume the output of this plant. These products are well packaged and are easy to handle. Transportation costs should be low in comparison to sales price. The extent of the market should be nationwide. A survey should be conducted to determine if wooden handles are being produced within the country on a small-scale plant and, if so, at what prices they are being sold. This is essential to determine what kind of local competition must be faced. If an adequate supply of suitable lumber is readily available and the plant is well managed, it should have no difficulty in competing with imported products. But a plant of this capacity would not be able to compete in world markets although some export sales could be made in neighboring countries without this plant capabilities or capacities.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $176,000.
The total fixed investment, plus working capital, is estimated at $94,000.
The annual gross profit, before taxes, is estimated at $13,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 7.4%.
(A gross profit on sales, before taxes, of 7.4%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 13.8%.

5. COST PER MAN EMPLOYED

Nine direct and five indirect workers, or a total of fourteen workers, are employed.
The total fixed capital investment is estimated at $ 64,000.
Based on these figures, the fixed investment per man employed would amount to about $4,575.

C. PRODUCTION REQUIREMENTS WOODEN HANDLES I.P. No. 67289
ANNUAL CAPACITY - ONE SHIFT OPERATION: 250,000 HANDLES S.I.C. 2499
FOR HOE, RAKE, SHOVEL, FORK, SPADE, BROOM, HAMMER, AXE, HATCHET, MALL, SLEDGE, PICK, WOOD CHISEL, & SMALL GARDEN TOOLS
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - 1 acre	
Building - 60' x 80' or 4,800 sq. ft.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 64,000

Principal items:
1 Cutoff Saw
Ripsaw
Backknife Lathe
Knife Lathe
2 Trim Saws
Sanding Lathe
2 Belt Sanders
Chucking Machine

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 30,000
c. Total Capital Requirements	$ 94,000

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Lumber	250,000 bd. ft.	
Wax and lacquer		
Packaging material		
Total direct materials		$ 40,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,450

c. Availability of materials & supplies

All materials and supplies should be available locally, in most areas.

3. POWER, FUEL AND WATER

Electric Power - 60 H.P. connected load Fuel - Scrap wood used Water - Sanitation and protection only	Annual Cost $ 1,100

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 6,450

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Forman & maintenance	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	3	
Unskilled workers	4	
Total direct labor	9	$ 41,400

c. Training needs

The manager should be thoroughly experienced. He and two skilled worker should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck.

b. External transport facilities

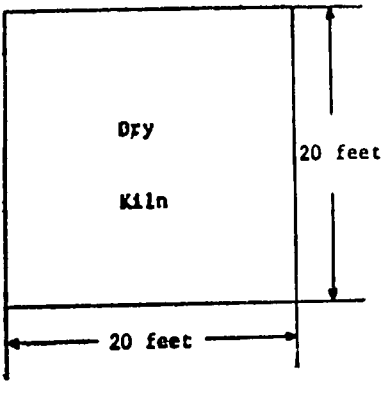
Good highways are essential.
Plant should be located on a railroad, if possible.

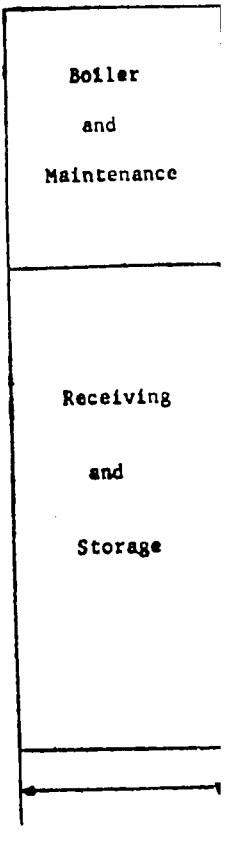
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 40,000	
Direct labor	41,400	
Manufacturing overhead*	48,000	
Total manufacturing cost		$ 129,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 13,600
Sales expense		$ 15,000
Freight-out, travel discounts Allowances & bad debts		$ 5,000
Total annual costs		$ 163,000
Annual Gross Profit		$ 13,000
ANNUAL SALES REVENUE		$ 176,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYC



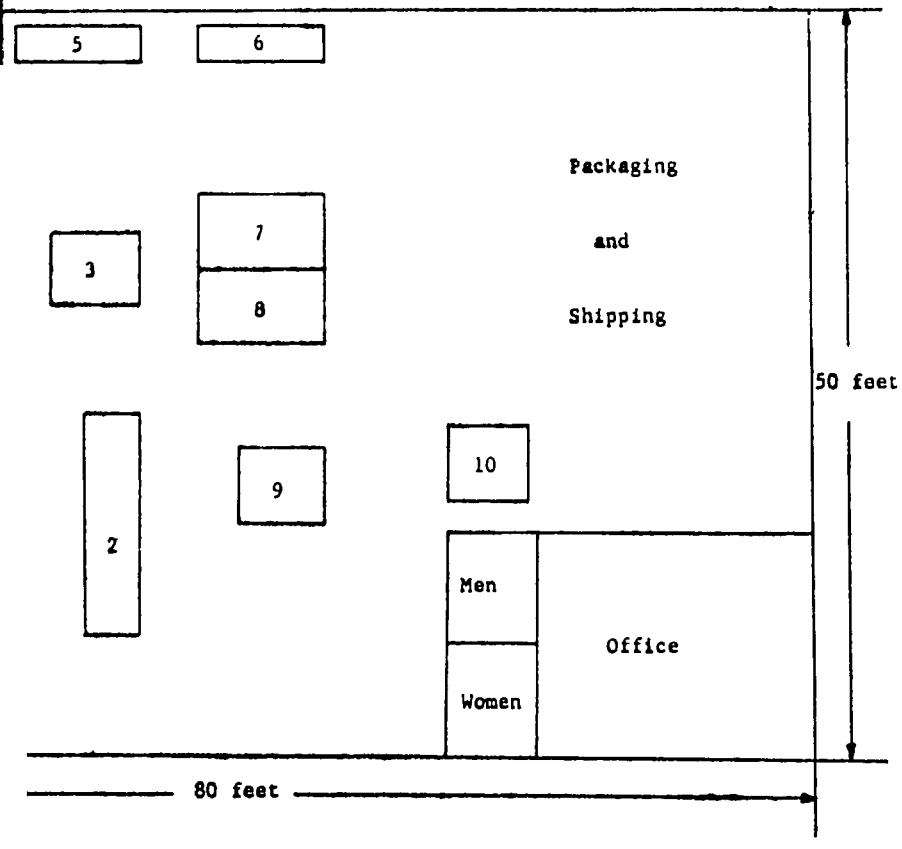


1 Cutoff Saw
2 Ripsaw
3 Trim Saw
4 Knife Lath
5 Backknife L

DLES

I. P. NO. 67289
S. I. C. 2499

WORKFLOW



6 Sanding Machine
7 Belt Sander
8 Belt Sander
9 Trim Saw
10 Chucking Machine

WOODEN HANDLES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. General Woodworking. 3rd Edition. C. H. Groneman. 1965. 256 pp. Illus. $7.25

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Machine tool processes, hand tool processes, portable tool processes, and related woodworking information.

B. Technical Woodworking. Everett R. Glazener and C. H. Groneman. 1966. 474 pp. 1,550 Illus. $6.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

C. Woodworking Fundamentals. William D. Wolansky and R. H. King. 1962. 167 pp., 275 Illus. $2.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

II. TECHNICAL AND TRADE PERIODICALS

A. Wood Working Digest. Monthly. $5.00/year

Hitchcock Publishing Company
Wheaton, Illinois 60188

Covers the major branches of the woodworking industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of Small Business Administration, Washington, D. C.

Suprintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 2,543,746. 1955. 12 p.
Machine for making split D handle grips.

Only one current Patent available on Wooden Handles.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Woodworking Machinery Manufacturers Association
1900 Arch Street
Philadelphia, Pennsylvania 19103

B. American Forest Products Industries, Inc.
1835 N Street, N. W.
Washington, D. C. 20036

VI. DIRECTORIES

A. Hitchcock's Wood Working Directory and Handbook. Annual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

Lists manufacturers and suppliers for the wood working industries.

B. Housewares Directory. Annual. $1.00

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists manufacturers of houseware and hardware products and their suppliers.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

ELECTRIC OUTLET, SWITCH AND FUSE BOXES

I. P. No. 67290
S. I. C. 3644

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67290
S.I.C. 3644
DECEMBER 1967

ELECTRIC OUTLET, SWITCH AND FUSE BOXES

PRODUCT DESCRIPTION

Metal boxes and covers for electric outlet boxes, switch boxes and fuse boxes.

A. GENERAL EVALUATION OF PROSPECTS

This plant is equipped to make electric switch boxes and electric outlet boxes and electric fuse boxes of various kinds and sizes. It can be adapted to other products that are stamped or formed in punch presses. There is a wide variation in cost and selling price of these products, ranging from 10c to 35c, depending on the size and the detail involved. Since the majority of sales will probably be of the smaller type, an average price of 18c for each box and cover will be used for computing costs in this profile. This industry is suitable for countries where electric power is in general use.

B. MARKET ASPECTS

1. USERS

Building contractors, individual property owners; wherever electricity is instaled.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are almost always made to wholesalers who distribute to building contractors and retail stores. These products are small and well packaged and the transportation costs are low in relation to the unit value. The potential market for them should be nationwide. Electric outlet, switch and fuse boxes manufacturing requires a considerable investment in machinery. The only domestic competition would come from other plants within the same country manufacturing the same products. These products are exported worldwide but a plant of the size proposed here would not be able to compete in the international marketplace. Some sales to neighboring, friendly countries might be possible, however.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 180,000.
The total fixed investment, plus working capital, is estimated at $ 123,600.
The annual gross profit, before taxes, is estimated at $ 19,000.
Based on these figures, the profit on gross sales, before taxes, amounts to 10.6%.
(A gross profit on sales, before taxes, of 10.6%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 15.4%.

5. COST PER MAN EMPLOYED

Eleven direct workers and six indirect workers, or a total of seventeen workers, are employed.
The total fixed capital investment is estimated at $ 91,000.
Based on these figures, the fixed investment per man employed would amount to about $ 5,300.

C. PRODUCTION REQUIREMENTS ELECTRIC OUTLET, SWITCH AND FUSE BOXES

I. P. No. 67290
S.I.C. 3644

ANNUAL CAPACITY - ONE SHIFT OPERATION: 1,000,000 PCS

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital — Cost

Land - 1/2 acre

Building - one story, 40' x 60'

Equipment, furniture & fixtures
Prodn. tools & equipment
Other tools & equipment
Furniture & fixtures
Transportation equipment
Total fixed capital — $ 91,000

Principal Items :

1 Square Shears
1 20-ton Press
1 40-ton Press
2 Drill Presses
Pivoting Machine Press

b. Working Capital (30 days)

Direct materials
Direct labor
Manufacturing overhead
Administrative costs
Sales costs
Freight-out, discounts, bad debts & allowances
Sales revenue
Training costs
Total working capital — $ 32,600

c. Total Capital Requirements — $123,600

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Sheet steel	as required	
Bolts and nuts		
Packaging material		
Total direct materials		$ 23,000

b. Supplies

Lubricants & hand tools
Cutting tools & abrasives
Maintenance & spare parts
Office supplies
Gas, oil and maintenance for truck

Total supplies — $ 3,600

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER — Annual Cost

Electric Power - 35 H. P. connected load
Fuel - Heating as required
Water - Sanitation and fire protection — $ 1,500

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,200

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Foreman	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct labor		
Skilled workers	2	
Semi-skilled workers	4	
Unskilled workers	5	
Total direct labor	11	$ 50,000

c. Training needs

The manager and the foreman, with one skilled worker, should be able to train all workers and reach full production in three weeks.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

In and out shipments amount to 7 tons per day.

Good highways and railroad if possible.

7. TOTAL ANNUAL COSTS AND SALES

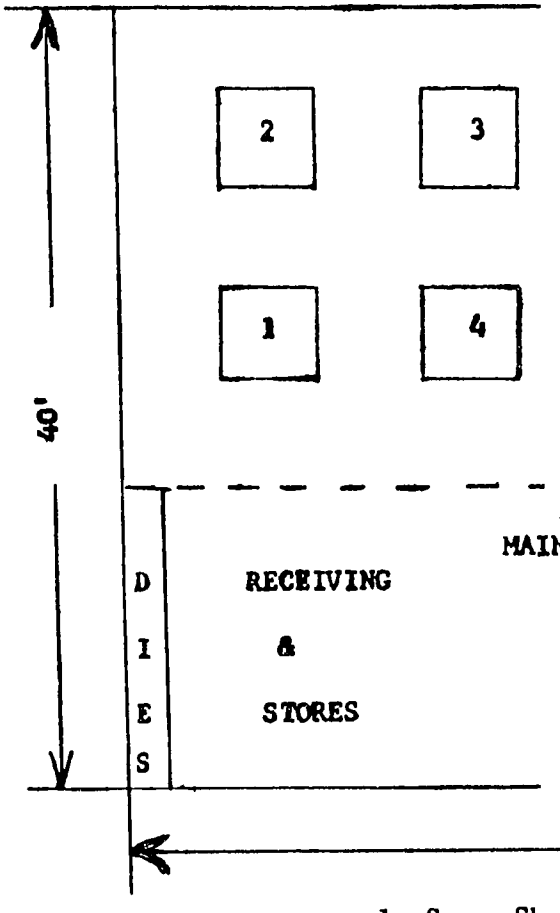
REVENUE		
Direct materials	$ 23,000	
Direct labor	50,000	
Manufacturing overhead*	59,300	
Total manufacturing cost		$ 132,300
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 11,700
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 5,000
Total annual costs		$ 161,000
Annual Gross Profit		$ 19,000
ANNUAL SALES REVENUE		$ 180,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

ELECTRIC OUTLET

P L

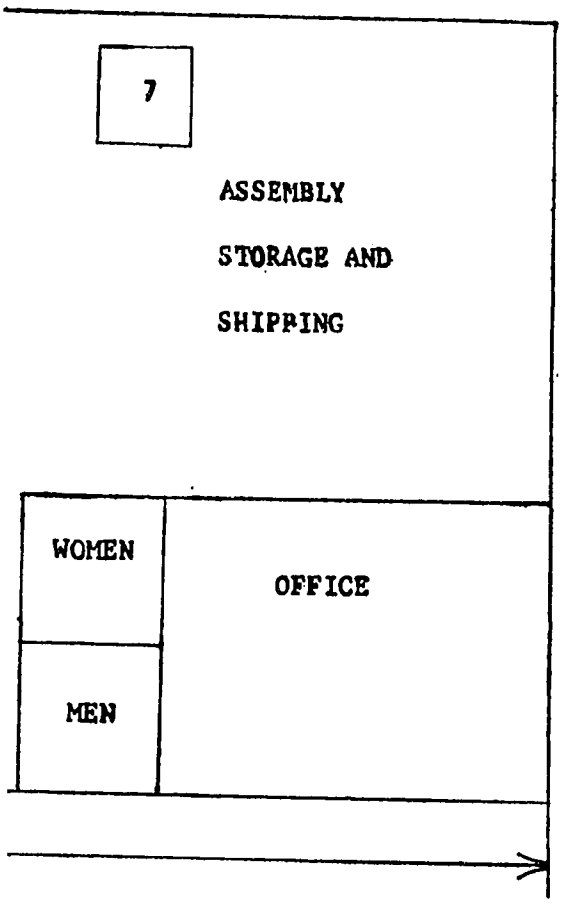


1. Square She
2. 50 Ton Pre
3. 40 Ton Pre

AND FUSE BOXES

I. P. NO. 67290
S. I. C. 3644

Y O U T



4. 20 Ton Press
5. Drill Press
6. Drill Press

ıg

I.P. No. 67290
S.I.C. 3644

ELECTRIC OUTLET, SWITCH AND FUSE BOXES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. ASME Handbook - Metal Engineering, Processes. R. W. Bolz, Editor. 1958. 448 pp. Illus. $13.50

McGraw-Hill Book Company, Inc.
330 West 42nd Street
New York, New York 10036

Presents basic facts on metal working, including forming.

B. Electronics. Roy H. Mattson. 620 pp. $12.95.

John Wiley & Sons, Inc.
605 Third Avenue
New York, N. Y. 10016

Discusses the operation, modeling and application of active devices with emphasis on semi-conductor devices.

II. TECHNICAL AND TRADE PERIODICALS

A. Machinery. Monthly. $10.00/year

The Industrial Press
200 Madison Avenue
New York, New York 10016

Magazine of engineering and production in the manufacture of metal products.

B. Electrical World. Weekly. $8.00/year.

McGraw Hill, Inc.
330 West 42nd Street
New York, New York 10036

Information on supplies and services relating to electrical products industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $ 1.00

Superintendent of Documents
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Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,299,027. January 1966. 4 p.
Junction box and channel type electric wire way.

B. Patent No. 3,187,084. June 1965. 7 p.
Junction box with detachable supporting means.

C. Patent No. 3,187,085. June 1965. 4 p.
Hub for meter socket and the like.

D. Patent No. 3,183,297. May 1965. 7 p.
Connector for outlet boxes.

E. Patent No. 3,139,480. June 1964. 5 p.
Electrical junction box with eccentric sockets in a common base.

F. Patent No. 3,131,512. May 1964. 5 p.
Underfloor blind electrical terminal box.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Electric Fuse Manufacturers Guild
331 Madison Avenue
New York, New York 10017

B. National Electrical Manufacturers Association
155 East 44th Street
New York, New York 10017

VI. DIRECTORIES

A. Housewares Directory, Annual. $1.00

Haire Publishing Co.
111 Fourth Avenue
New York, New York 10003

Lists U.S. manufacturers of hardware products and their suppliers.

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Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

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INDUSTRY PROFILES

NEON SIGNS

I. P. No. 67291
S. I. C. 3993

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NEON SIGNS

PRODUCT DESCRIPTION

Electric signs made with glass tubing filled with neon gas.

A. GENERAL EVALUATION OF PROSPECTS

No expensive equipment is required; therefore, the fixed investment is very low in comparison with the gross sales and the number of people employed. Neon signs are used worldwide for advertising purposes. Therefore, there will always be a demand for this product unless something cheaper and better is developed to take its place. There is considerable service or repair work connected with the operation of this plant which goes to augment gross sales.

B. MARKET ASPECTS

1. USERS

Many kinds of businesses and industries.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are usually made at the request of the customer. The customer often asks two or more neon sign companies to bid on his order. Since this product is usually displayed by stores, businesses and industries of all kinds, the potential market for these items will depend entirely upon the number of establishments using this product. Obviously, most stores and industries are located in urban areas but some signs could be sold in smaller communities and outlying towns. These signs are fragile ond difficult to transport by truck over long distances, especially if the roads are rough. Domestic competition is apt to be keen since customers require competitive bids. The quality of the work, the artistic design of the signs, and service and maintenance of the finished product will play important parts in making sales. Neon signs are not commonly exported.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $180,000
The total fixed investment, plus working capital, is esimated at $70,600.
The annual gross profit, before taxes, is estimated at $21,600.
Using these figures, the profit on gross sales, before taxes, amounts to 12%.
(A gross profit on sales, before taxes, of 12%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 31%.

5. COST PER MAN EMPLOYED

Seven direct workers and three indirect workers, or a total of ten workers, are employed.
The total fixed capital investment is estimated at $10,000.
Based on these figures, the fixed investment per man employed would amount to $1,000.

C. PRODUCTION REQUIREMENTS NEON SIGNS
ANNUAL CAPACITY - ONE SHIFT OPERATION: 12,000 SQ. FT. OF SIGNS

I.P. No. 67291
S.I.C. 3993

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - none	
Building - one story 30' x 40'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 10,000

Principal items:

Compressor
Hand Torch
Hand Tools
Bombarders
Vacuum Pump
Ribbon Burner
Crossfire Burner
Paint Spray
Derrick
Ladders
Truck

b. Working Capital (60 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 60,600
c. Total Capital Requirements	$ 70,600

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Glass tubing and rods	36,000	
Glass rods	500	
Electrodes	2,400	
Transformers	1,200	
Neon gas		
Galvanized metal		
Paint		
Suitable boxes, wire, cable, etc.		
Total direct materials		$ 46,600

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Rent for building	
Total supplies	$ 6,100

c. Availability of materials & supplies

Some may have to be imported. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - Testing	
Fuel - Gas heat and production	
Water - Sanitation and fire production	
	$ 1,400

4. DEPRECIATION

	Yrs. life	Amount
Building	0	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 1,900

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Office	1	
Truck Driver	1	
Total indirect labor	3	$ 23,000
b. Direct labor		
Skilled workers	4	
Semi-skilled workers	2	
Unskilled workers	1	
Total direct labor	7	$ 37,600

c. Training needs

The manager and skilled workers must be fully experienced. They should be able to train the other workers and reach full production in thirty days.

6. TRANSPORTATION

a Own transport equipment

Truck

b. External transport facilities

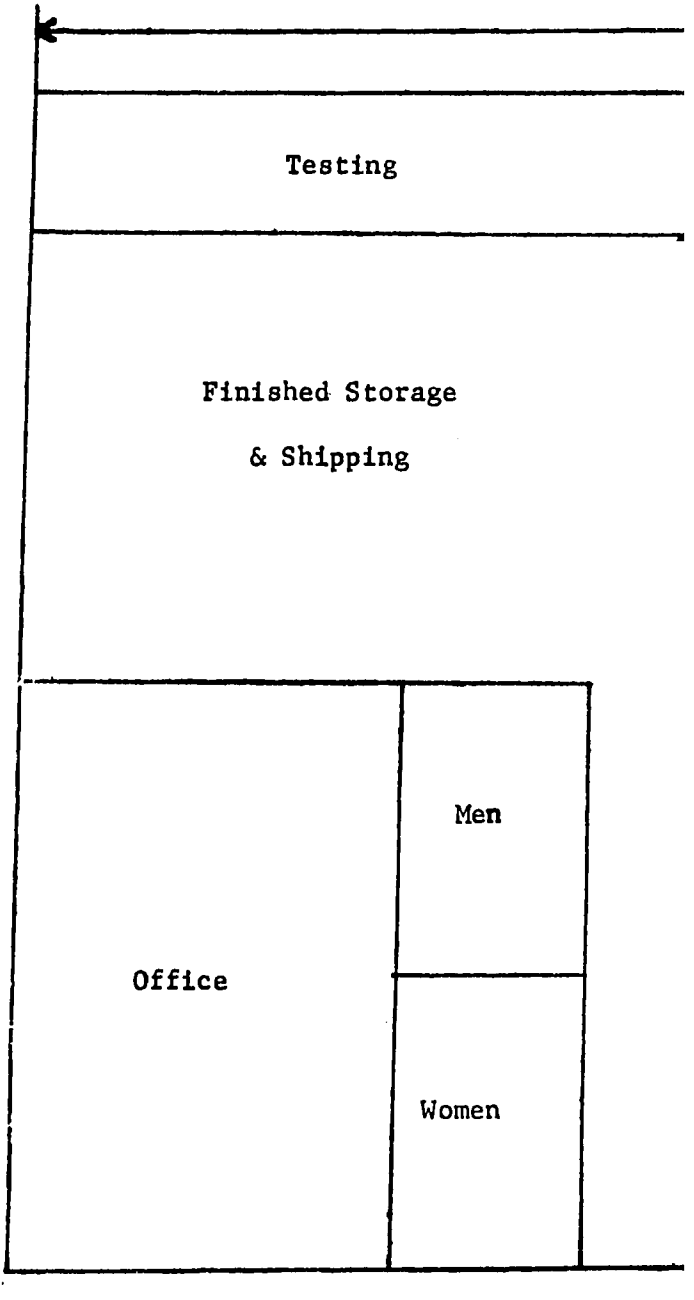
In and out shipments small.

Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 46,600	
Direct labor	37,600	
Manufacturing overhead*	32,400	
Total manufacturing cost		$ 116,600
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 18,500
Sales expense		$ 18,500
Freight-out, travel discounts Allowances & bad debts		$ 4,800
Total annual costs		$ 158,400
Annual Gross Profit		$ 21,600
ANNUAL SALES REVENUE		$ 180,000

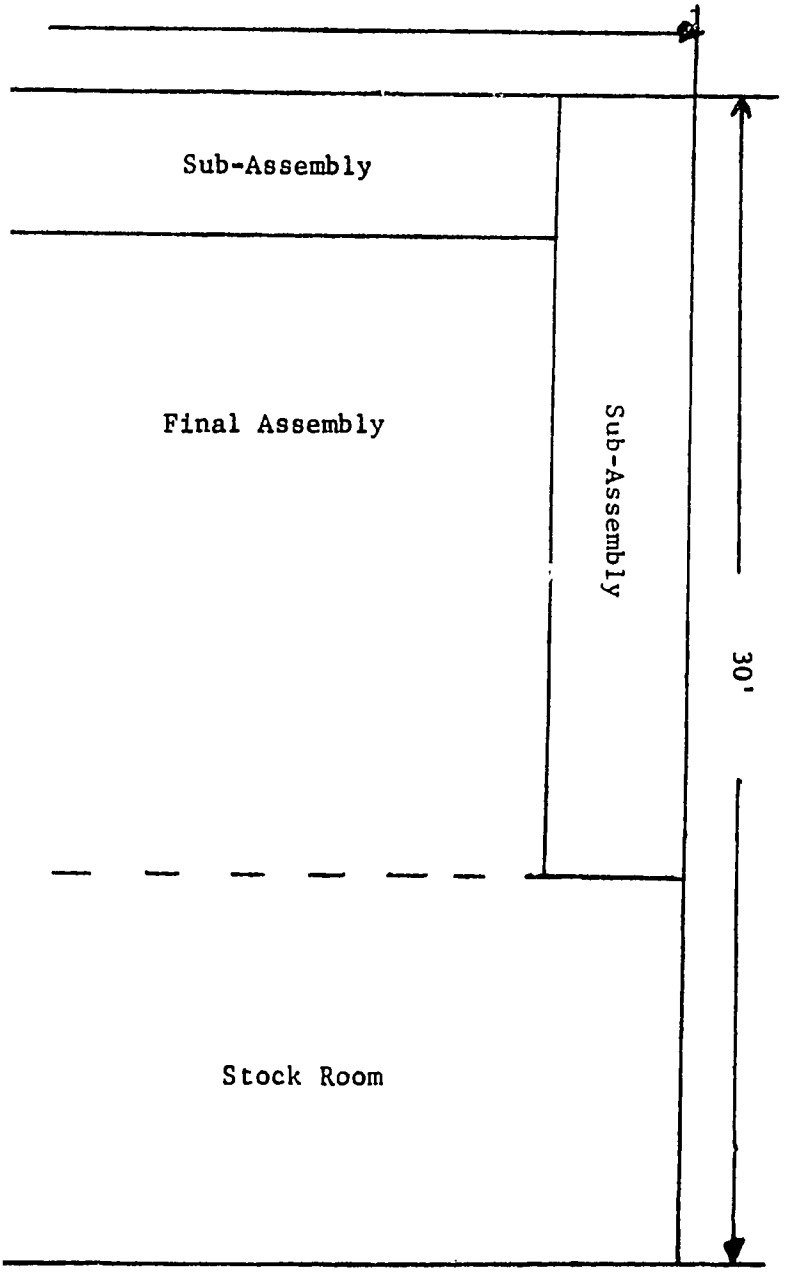
*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.


Testing
Finished Storage
& Shipping
Men
Office
Women

N SIGNS

I. P. NO. 67291
S.I.C. 3993

LAYOUT



I. P. No. 67291
S.I.C. 3993

NEON SIGNS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Glass Engineering Handbook. E. B. Shand. 1958. 471 pp. Illus. $12.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Describes chemical and physical properties and methods of testing glass.

B. Light Photometry and Illuminating Engineering. W. E. Barrows. 3rd Edition, 415 pp. Illus. $10.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Includes description of gas, vapor and fluorescent lighting for commercial purposes.

II. TECHNICAL AND TRADE PERIODICALS

A. Glass Industry. Monthly. $6.00/year

Glass Publishing Company
777 Third Avenue
New York, New York 10017

Latest developments, processes, and markets in glass and related products.

B. Electrical World. Weekly. $8.00/year

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Information of supplies and services relating to electrical products.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20.

Small Business Management Series No. 4
U.S. Government Printing Office
Washington, D.C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,213,515. October 26, 1965 3 p.
Process for increasing light emission, stabilization and rejuvenation of electroluminescent lamps.

B. Patent No. 3,260,583. July 12, 1966 5 p.
Method of sealing glass tubes.

C. Patent No. 3,169,657. February 16, 1965 6 p.
Machine for forming lamp tubes and articles formed thereby.

D. Patent No. 2,824,993. February 25, 1958 3 p.
Tubular flourescent lamp.

E. Patent No. 3,275,872. September 27, 1966 4 p.
Reflector flourescent lamp.

F. Patent No. 3,258,629. June 28, 1966 3 p.
Cold cathook display device with flourescent inclicia anodes.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Electric Sign Association
10912 South Western Avenue
Chicago, Illinois 60643

Publishes monthly magazine, NESA News.

B. International Sign Association
182 East Severin Road
Port Charlotte, Florida 33952

VI. DIRECTORIES

A. Electronic Buyers Guide and Reference Issue. Annual. $3.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

5,000 manufacturers, 3,800 product categories and cross references of electronic components, equipment, materials, supplies, and services.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

MEAT CANNING PLANT

I. P. No. 67292
S. I. C. 2011

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67292
S.I.C. 2011
NOVEMBER 1967

MEAT CANNING PLANT

PRODUCT DESCRIPTION

Beef canned in number 2-1/2 cans.

A. GENERAL EVALUATION OF PROSPECTS

The fixed investment required for this plant is relatively small in comparison with the number of people employed and the annual sales revenue. Only three skilled workers are required out of a total of 23 workers, both direct and indirect. The prospects for this industry will depend on an adequate supply of meat from slaughter houses at reasonable prices and the diet habits of the urban population. Where beef is a staple part of the diet of the population and an adequate supply of beef is available, the prospects for this industry should be favorable.

B. MARKET ASPECTS

1. USERS

Homes, restaurants, hotels, clubs, institutions and military.

2. SALES CHANNELS AND EXTENT OF MARKET

This plant would sell direct to wholesalers who supply small users and to large users such as institutions and military installations. The product is shipped in corrugated paper boxes that are not bulky and are easily handled. The value of the product is high in relation to transportation costs so nationwide distribution should be considered. Canned meat may have to compete with several other animal protein foods that are cheaper (fish, poultry, eggs, cheese, and other meat substitutes). In countries where animals are slaughtered in the public market place and the meat sold at a price below that of canned beef, sales will be difficult. But canned beef has the advantage of not needing refrigeration. Institutions, government and military installations which require a continuous supply of meat will, therefore, be prime marketing prospects. A meat canning plant of this capacity should not expect to compete with large, mass production meat canning plants in the international market but could export to friendly neighboring countries with no meat canning plants of their own.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $400,000.
The total fixed investment, plus working capital, is estimated at $135,900.
The annual gross profit, before taxes, is estimated at $32,000.
Using these figures, the profit on gross sales, before taxes, amounts to about 8%.
(A gross profit on sales, before taxes, of 8%, while reflecting U.S. experience, should not be considered normal for a developing country, where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 23.5%.

5. COST PER MAN EMPLOYED

Eighteen direct workers and five indirect workers, or a total of 23 workers, are employed.
The total fixed capital investment is estimated at $69,000.
Based on these figures, the fixed investment per man employed would amount to $3,000.

C. PRODUCTION REQUIREMENTS MEAT CANNING — I. P. No. 67292
ANNUAL CAPACITY - ONE SHIFT OPERATION: 350,000 NO. 2-1/2 SIZE CANS — S.I.C. 2011

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 1.5 acres	
Building - one story 50' x 100'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 69,000

Principal items:
Boiler (20 HP), 5 Retorts, 3 Power Sealers, 2 Exhausters, Hoist & Truck, 5 Cutting Tables, 4 Sinks, Flange Former, Can Former, Flanger & Seamer, 2 Scales, Air Compressor, Meat Bandsaw Processing equipment: Refrigerator with overhead conveyors & meat hooks

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 66,900

c. Total Capital Requirements $ 135,900

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Beef	1,932 tons	
Cans	350,000	
Cartons & labels		
Total direct materials		$ 160,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance on truck	
Total supplies	$ 2,500

c. Availability of materials & supplies
Plant should be located at slaughterhouse. All should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 20 HP connected load	
Fuel - 13,000 gals. oil	
Water - 2,000,000 gals.	$ 2,450

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 5,850

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct labor		
Skilled workers	3	
Semi-skilled workers	3	
Unskilled workers	12	
Total direct labor	18	$ 81,000

c. Training needs
Manager and supervisor should be fully experienced. They, with the help of two skilled workers, should be able to train all workers and reach full production in 30 day

6. TRANSPORTATION

a. Own transport equipment
Truck

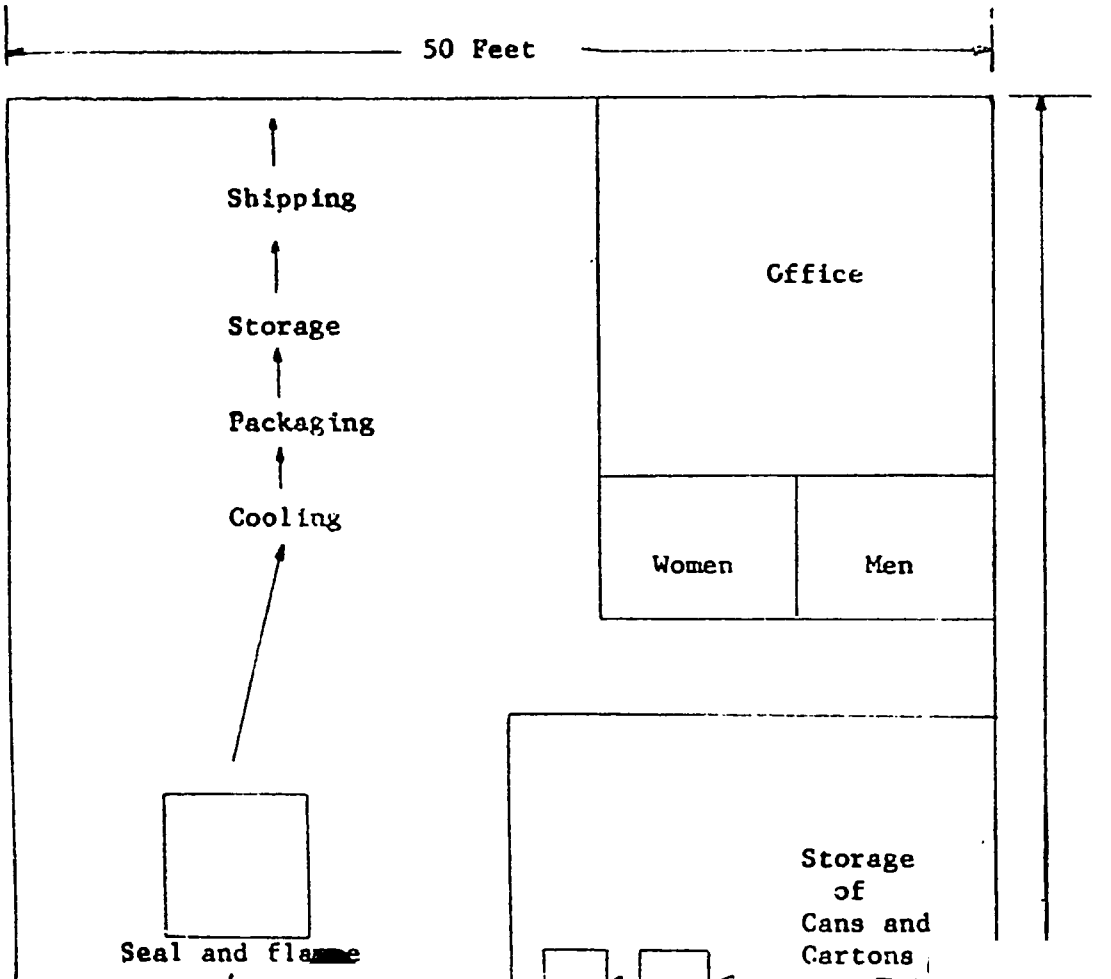
b. External transport facilities
Plant should be located near a slaughterhou
Good highways necessary.

7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$160,000	
Direct labor	81,000	
Manufacturing overhead*	47,800	
Total manufacturing cost		$ 288,800
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 35,200
Sales expense		$ 24,000
Freight-out, travel discounts Allowances & bad debts		$ 20,000
Total annual costs		$ 368,000
Annual Gross Profit		$ 32,000
ANNUAL SALES REVENUE		$ 400,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

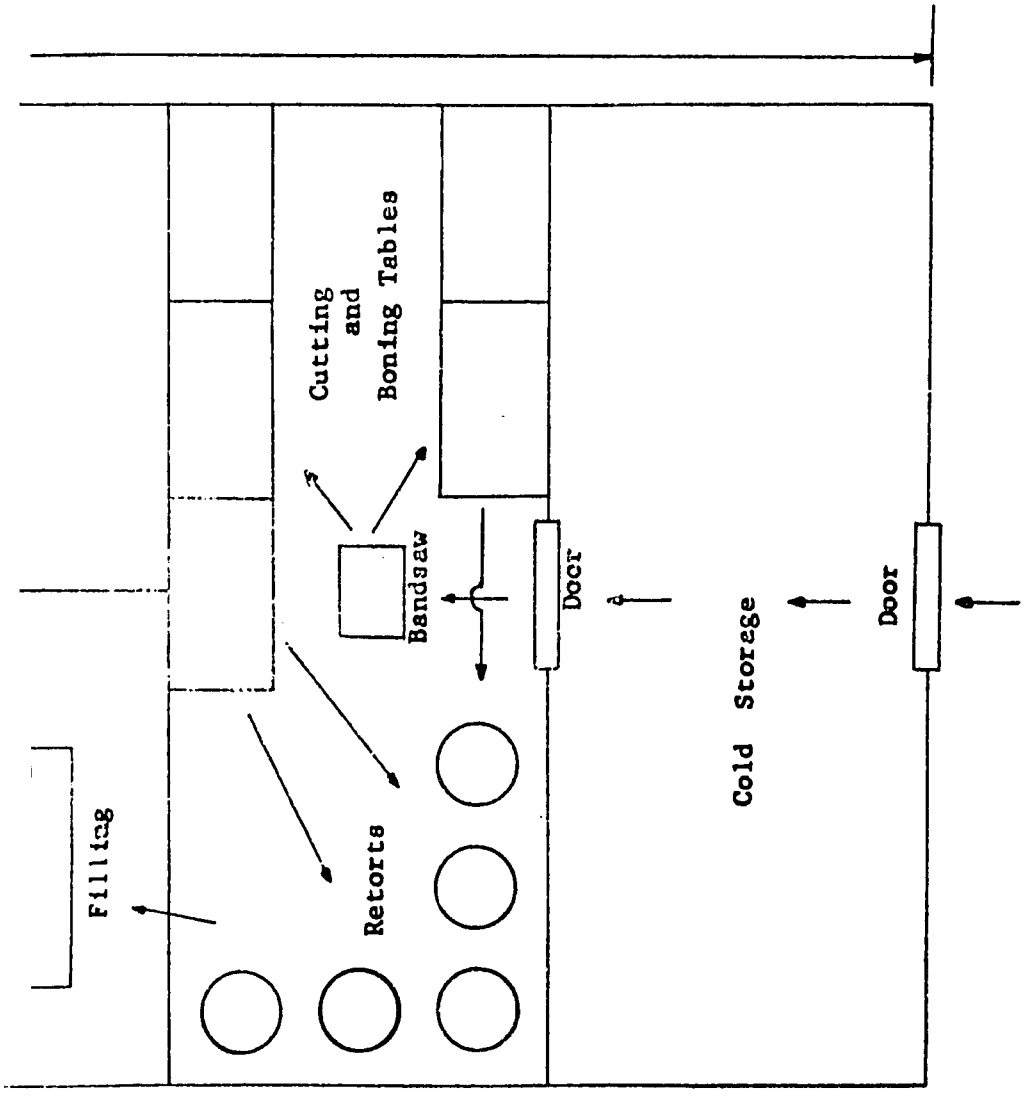
PLANT LAYOUT AND WORKFLOW



MEAT C

G PLANT

I. P. NO. 67292
S.I.C. 2011



MEAT CANNING PLANT

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Butchering, Processing, and Preservation of Meats. F. G. Ashbrook. 1955. 318 pp. Illus. $6.00

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

Practical instructions for slaughtering, cleaning, processing, and freezing meats and meat products.

B. Meat for the Table. American Meat Institute, Illus. $8.00

Cooper Freeman & Co.
1736 Stockton Street
San Francisco, California 94104

Economics of meat production, the packing industry, with information on the processing of meat products.

C. Federal Food, Drug, and Cosmetic Act, as amended. General Regulations for its Enforcement, Title 21, Part 1, $3.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

D. The Science of Meat and Meat products. American Meat Institute Foundation. 1960. 435 pp. Illus. $8.00

Reinhold Publishing Corporation
430 Park Avenue
New York, New York 10022

Includes information on meat processing and the manufacture of sausage products.

II. TECHNICAL AND TRADE PERIODICALS

A. Food Engineering, Monthly. $10.00/year

Chilton Publishing Company
Chestnut & 56th Streets
Philadelphia, Pennsylvania 19139

Sources, processes, prices, and markets of staple foods and food products, including meats.

B. Meat Processing - Sausage Manufacturing. Monthly. $7.00/year

Robert E. Davies
645 No. Michigan Avenue
Chicago, Illinois 60611

Processing and marketing information of primary interest to meat packers.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $0.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231 $.50 each

A. No. 3,332,770. February 1966. 9 p.
Method of sterilizing and canning food material.

B. No. 3,235,388. February 1966. 8 p.
Method of producing food products.

C. No. 3,215,539. November 1965. 4 p.
Method of sterilizing food in sealed containers.

D. No. 3,192,053. June 1965. 4 p.
Process for canned meat.

E. No. 2,995,449. 1961. 9 p.
Method for making skinless sausages.

F. No. 2,978,738. 1961. 3 p.
Method of processing animal carcasses.

G. No. 2,875,222. 1959. 2 p.
Rendering of animal fats,

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Meat Canners Association
59 East Van Buren St.
Chicago, Illinois 60605

B. National Meat Industry Council
25 Broad Street
New York, New York 10004

VI. DIRECTORIES

A. Purchasing Guide for the Meat Industry. Annual. $7.50

National Provisioner, Inc.
15 West Huron Street
Chicago, Illinois 60610

Lists manufacturers of equipment and supplies used in the meat processing industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

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INDUSTRY PROFILES

BREWERS FLAKES

I. P. No. 67293
S. I. C. 2082

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BREWERS FLAKES

I. P. No. 67293
S.I.C. 2082
DECEMBER 1967

PRODUCT DESCRIPTION

Unmalted cereal starch from corn, treated to permit rapid conversion to sugar by the enzymes present in the malt with which it is used in the brewing of beer.

A. GENERAL EVALUATION OF PROSPECTS

The capital requirements for this plant are fairly low in comparison with the gross sales and gross profits. The two principal factors relating to the prospects for this industry include: (1) the availability of an adequate local supply of the raw material (hominy grits) required, at a reasonable cost; and (2) a local market for 1,000 tons of brewers flakes per year at about $200 per ton. Unless one or more breweries are operating within the country, this plant would not have a market since brewers flakes are used only in breweries. The determination of the sales potential for this plant should be a relatively simple matter.

B. MARKET ASPECTS

1. USERS

Sales would be made direct to breweries, usually on an annual contract basis.

2. SALES CHANNELS AND METHODS

Sales would usually be made in 50 pound bags. Since the daily production of this plant is only about four tons--or 160 bags--the extent of the domestic market would be nationwide or anywhere within the country where breweries are located. This industry cannot be operated on a small basis and it cannot exist unless beer is brewed locally. One plant could probably supply the local needs and domestic competition would not exist. A plant of this production capacity could not compete with large, mass production plants in worldwide markets. However, an export market might be developed with friendly neighboring countries that have breweries but do not have plants for producing brewers flakes.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $ 200,000.
The annual profit, before taxes, is estimated at $ 20,000.
The total fixed investment, plus working capital, is estimated at $ 113,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 10%.
(A gross profit on sales, before taxes, of 10%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 17.7%.

5. COST PER MAN EMPLOYED

Seven direct workers and three indirect workers, or a total of ten workers, are employed.
The total fixed capital investment is estimated at $ 80,000.
Based on these figures, the fixed investment per man employed would amount to about $ 8,000.

C. PRODUCTION REQUIREMENTS - BREWERS FLAKES
ANNUAL CAPACITY - ONE SHIFT OPERATION : 1,000 TONS
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

I.P. No. 67293
S.I.C. 2082

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - 1 acre	
Building - 5,000 square feet. Local materials may be used.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 80,000

Principal items:
Storage Tanks, Conveyors, Continuous Rotary Blancher, Double Drum Flaker, Knife Blade Rotor Hammer Mill, Screw Packer and Bagger, Steam Boiler, Other Tools and Equipment

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales Costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 33,000

c. Total Capital Requirements $ 113,000

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Hominy grits (coarse)	1,000 tons	
Multiwall bags		
Total direct materials		$ 71,800

b. Supplies

Lubricants & band tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 2,000

c. Availability of materials & supplies
All materials and supplies should be available locally.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 90 kilowatts per day	
Fuel - Oil for process steam and heating	
Water - Production and sanitation. Must be potable	$ 2,400

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 6,800

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Office	1	
Truck Driver	1	
Total indirect labor	3	$ 23,000
b. Direct labor		
Skilled workers	1	
Semi-skilled workers	1	
Unskilled workers	5	
Total direct labor	7	$ 29,000

c. Training needs
The manager and skilled worker should have years of experience. They should be able to train other workers and reach full production in thirty days.

6. TRANSPORTATION

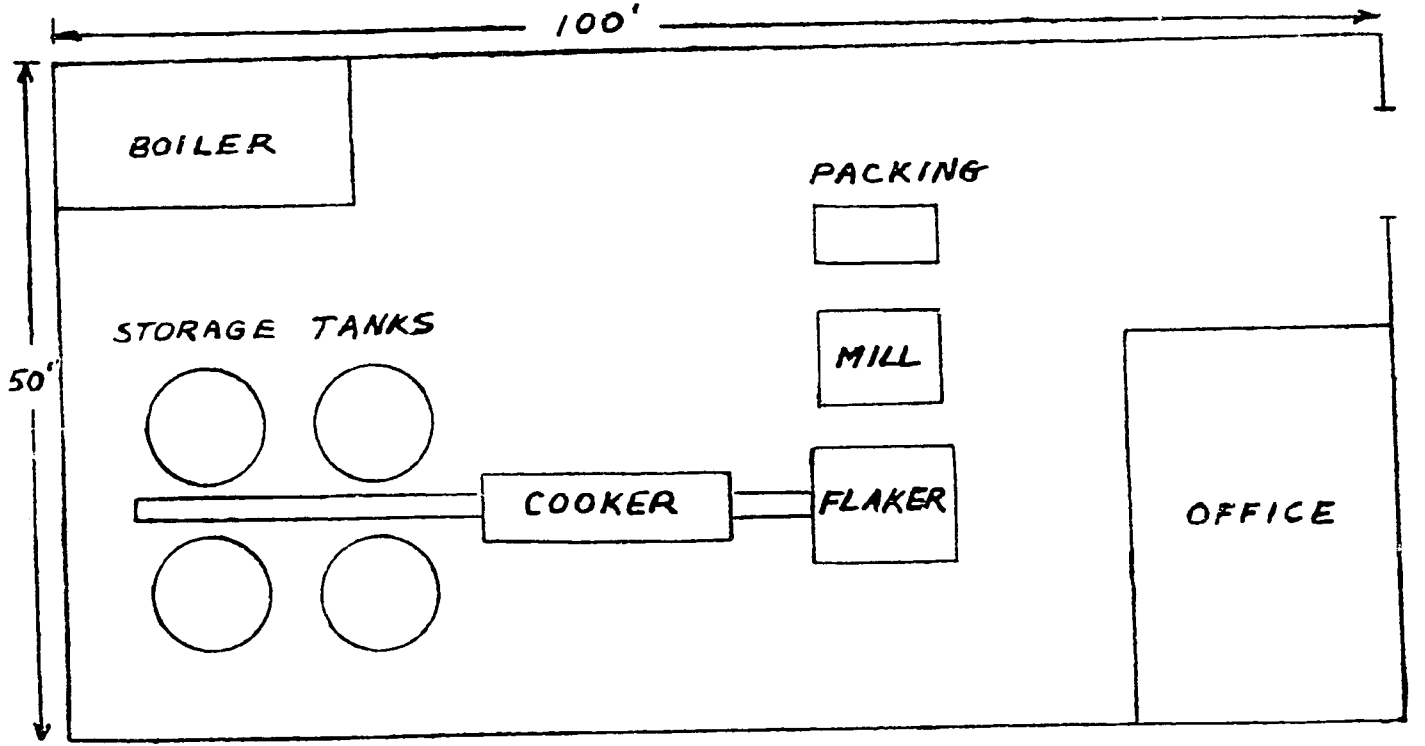
a. Own transport equipment
Truck

b. External transport facilities
In and out shipments amount to about 9 tons per day.
Good highways essential. Railroad if possible.

7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct materials	$ 71,800	
Direct labor	29,000	
Manufacturing overhead*	34,200	
Total manufacturing cost		$ 135,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 18,000
Sales expense		$ 16,000
Freight-out, travel discounts Allowances & bad debts		$ 11,000
Total annual costs		$ 180,000
Annual Gross Profit		$ 20,000
ANNUAL SALES REVENUE		$ 200,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.



PLANT LAYOUT

AKES

I. P. NO. 67293
S. I. C. 2082

Flaker

I.P. NO. 67293
S.I.C. 2082

BREWERS FLAKES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Federal Food, Drug, and Cosmetic Act, as amended. General Regulations for its Enforcement, Title 21, Part 1, $3.00.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Deals with all phases of quality and health aspects of processed foods, including additives, such as vitamins, seasoning, coloring, and the enforcement of regulations.

II. TECHNICAL AND TRADE PERIODICALS

A. The Brewers Digest. Monthly. $3.00/year.

Siebel Publishing Company
4049 W. Peterson Avenue
Chicago, Illinois 60646

Processing and management of various departments of breweries of all sizes.

B. Food Engineering. Monthly. $25.00/year.

Chilton Publishing Company
Chestnut & 56th streets
Philadelphia, Pennsylvania 19139

Devoted to all kinds of food engineering.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,249,446. May 1966. 6 p.
Method of drying food.

B. Patent No. 3,235,971. February 1966 6 p.
Method and apparatus for drying.

C. Patent No. 3,197,312. July 1965 5 p.
Process for preparing reconstitutable foods.

D. Patent No. 3,174,869. March 1965 4 p.
Flakes comestibles and processes for preparing same.

E. Patent No. 2,967,107. 1961 6 p.
Continuous fermentation process.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Brewers Association of America
541 West Randolph Street
Chicago, Illinois 60606

B. Brewers Yeast Council
605 North Michigan Avenue
Chicago, Illinois 60611

VI. DIRECTORIES

A Brewery Directory. Annual. $2.00

Brewers Digest
4049 West Peterson Avenue
Chicago, Illinois 60646

Lists suppliers to the brewing industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

RAISINS, DEHYDRATED GRAPES

I. P. No. 67294
S. I. C. 2034

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67294
S. I. C. No. 2034
NOVEMBER 1967

RAISINS, DEHYDRATED GRAPES

PRODUCT DESCRIPTION

Raisins (Dehydrated Grapes) in 15 oz. boxes

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend upon an adequate supply of grapes, suitable for making raisins, and a market for 11.5 million boxes of raisins. The supply of grapes must be sufficient to keep the plant in continuous operation 24 hours a day for a period of about 120 days each year. Capital requirements are quite high; competition from a few well established concerns will be keen. The quality of the product should be high and active salesmanship will be needed.

B. MARKET ASPECTS

1. USERS

Households, bakeries, military, wherever food is prepared.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made to wholesalers and direct to large consumers. Since this product is used in homes and wherever food is prepared or served, the geographical extent of the market would be nationwide. The product is well packaged and the shipping cost would not be prohibitive in comparison with the sales value of the product. Since a sizeable investment is required to produce this product, the principal competition encountered in the domestic market would be from other plants producing the same product. Raisins are sold worldwide. If grapes are available locally and plant management, quality of product and sales methods are adequate, this plant should be able to compete in the export market.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufacturered product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $2,000,000.
The total fixed investment, plus working capital, is estimated at $1,044,800.
The annual gross profit, before taxes, is estimated at $200,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 10%.
(A gross profit on sales, before taxes, of 10%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade)
The annual profit on the total capital requirements, before taxes, would amount to about 19.1%.

5. COST PER MAN EMPLOYED

One hundred and six direct workers and thirteen indirect workers, or a total of one hundred and ninteen workers are employed. The total fixed capital investment is estimated at $717,000. Based on these figures, the fixed investment per man employed would amount to about $6,025.

C. PRODUCTION REQUIREMENTS - RAISINS DEHYDRATED GRAPES I.P. No. 67294
ANNUAL CAPACITY - THREE SHIFT OPERATIONS 120 DAYS S.I.C. 2034
A YEAR: 11.5 MILLION BOXES

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital — Cost

Land - about 3 acres
Building - One story 100' x 240'
Equipment, furniture & fixtures
Prodn. tools & equipment
Other tools & equipment
Furniture & fixtures
Transportation equipment
Total fixed capital $ 717,000

Principal items:

Dry Shaker	Conveyors
Lye dipper	2 fork-lift trucks
Wet shaker	2 five-ton trucks
Sulphur houses	
Dehydrator tunnels	
Stemmer	
Vacuum unit	
Drying tunnel	
Floater washer	
Seeder	
Processor	
Boxing Machine	
Final packing equipment	

b. Working Capital (15-30 Days)

Direct materials
Direct labor
Manufacturing overhead
Administrative costs
Sales costs
Freight-out, discounts, bad debts & allowances
Sales revenue
Training costs
Total working capital $ 327,800

c. Total Capital Requirements $ 1,044,800

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Grapes	22,000 tons	
15 oz. boxes	11.5 M	
Cartons	320,000	
Total direct materials		$ 1,285,000

b. Supplies

Lubricants & hand tools
Cutting tools & abrasives
Maintenance & spare parts
Office supplies
Gas, oil and maintenance of trucks
Total supplies $ 18,200

c. Availability of materials & supplies

All should be available locally.
All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 200 H.P. connected load Fuel - gas Water - about 5 million gals. Water should be potable.	$ 85,000

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 66,800

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	3	
Office	2	
Inspection	3	
Maintenance	2	
Truck drivers	2	
Total indirect labor	13	$ 70,000
b. Direct labor		
Skilled workers	6	
Semi-skilled workers	12	
Unskilled workers	88	
Total direct labor	106	$ 165,000

c. Training needs

Manager and 3 supervisors should be fully experienced. They with 3 skilled workers should be able to train all workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

Two five-ton trucks.

b. External transport facilities

In and out shipments while plant operates 200 tons per day.
Good highways and railroad.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$1,285,000	
Direct labor	165,000	
Manufacturing overhead*	240,000	
Total manufacturing cost		$ 1,690,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 50,000
Sales expense		$ 40,000
Freight-out, travel discounts Allowances & bad debts		$ 20,000
Total annual costs		$ 1,800,000
Annual Gross Profit		$ 200,000
ANNUAL SALES REVENUE		$ 2,000,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

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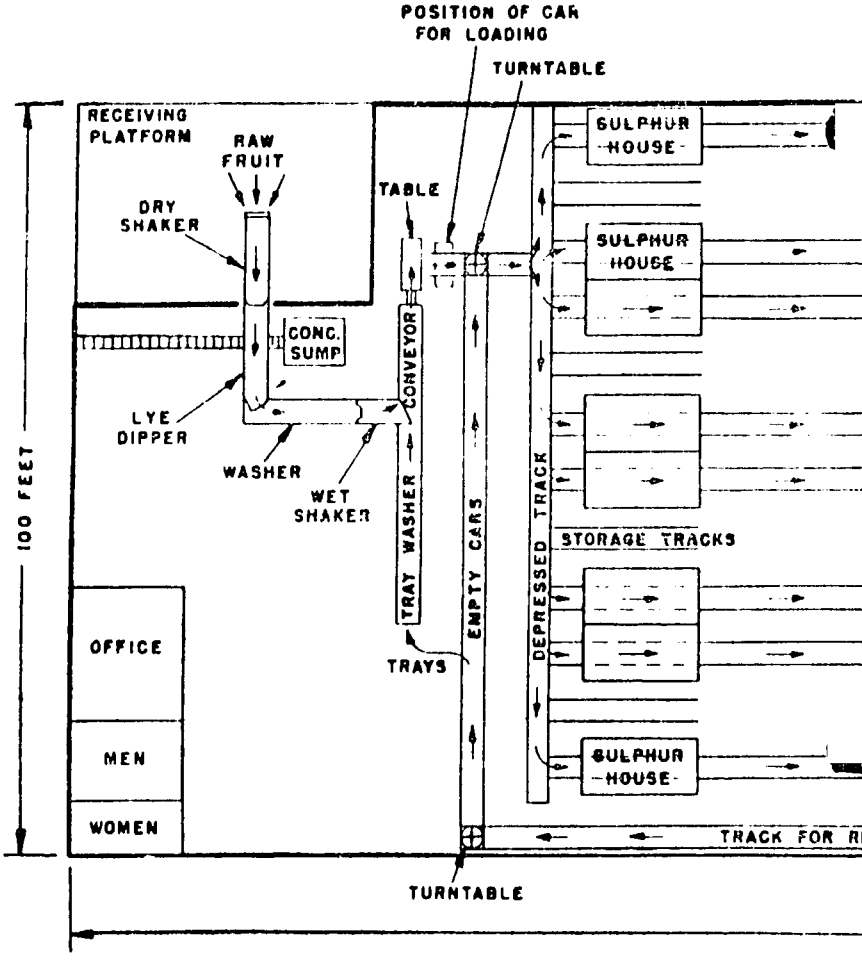
POSITION OF CAR FOR LOADING
TURNTABLE
RECEIVING PLATFORM
RAW FRUIT
DRY SHAKER
TABLE
SULPHUR HOUSE
SULPHUR HOUSE
CONC. SUMP
CONVEYOR
LYE DIPPER
WASHER
WET SHAKER
TRAY WASHER
EMPTY CARS
DEPRESSED TRACK
STORAGE TRACKS
100 FEET
OFFICE
MEN
WOMEN
TRAYS
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RATED GRAPES

I. P. NO. 67294
S. I. C. 2034

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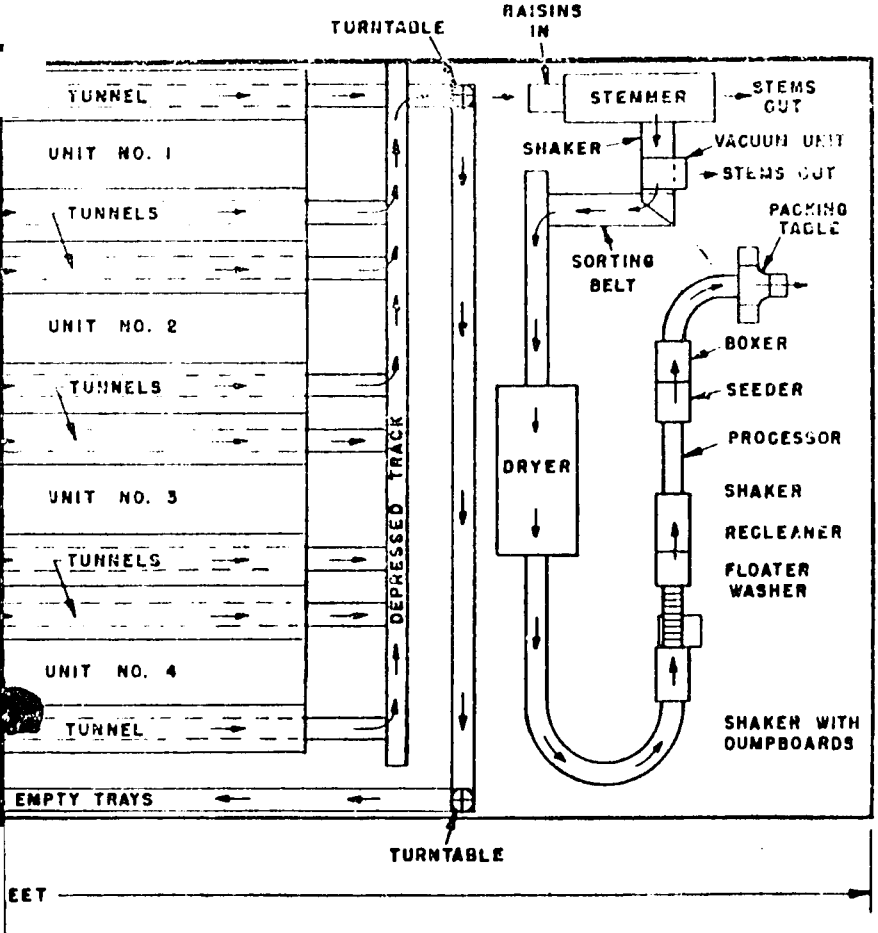

RAISINS, DEHYDRATED GRAPES

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Food Dehydration Principles. W.B. Van Arsdel. Vol. I. 1963. $10.00.

AVI Publishing Company
Box 388
Westport, Connecticut 06881

B. Devoted exclusively to the dehydration of foods.

C. The Dehydration of Food. T.N. Morris. 1948. 174 pp. Illus. $5.50.

D. Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 08540

D. Food Dehydration Processes and products. Vol. II. W.B. Van Arsdel and M.J. Copley. 1964. 732 pp. Illus. $23.50.

AVI Publishing Company
Box 388
Westport, Connecticut 06881

II. TECHNICAL AND TRADE PERIODICALS

A. Food Engineering. Monthly. $25.00/year.

Chilton Publishing Company
Chestnut and 56th Streets
Philadelphia, Pa. 19139

Covers all phases of food engineering.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $0.20.

Small Business Management Series No. 4
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Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00.

Small Business Research Series No. 2
U.S. Government Printing Office
Washington, D.C. 20402

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IV. REPRESENTATIVE U.S. PATENTS

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A. Patent No. 3,249,446. May 3, 1966 6 p.
Method for drying foods.

B. Patent No. 3,197,312. July, 1965 5 p.
Process for preparing reconstitutable foods.

C. Patent No. 3,194,670. July 1965 3 p.
Method of dehydrating food.

D. Patent No. 3,170,803. February 23, 1965. 6 p.
Preparation of dehydrated food products.

E. Patent No. 3,031,313. April 24, 1962. 7 p.
Dehydration of fruits and vegetables.

F. Patent No. 2,844,476. July 22, 1958. 3 p.
Process of comminuating and dehydrating foods--relates to the comminuting and dehydration of fruits and vegetables such as potatoes, carrots, beets, apricots, apples, etc.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. California Raisin Advisory Board
2240 North Angus Avenue
Fresno, California 93703

B. Sun-Maid Raisin Growers of California
2902 Hamilton Avenue
Fresno, California 93721

VI. DIRECTORIES

A. Fruit Growers Buyers Guide. Annual. No price listed.

Meister Publishing Company
Willoughby, Ohio

Lists 2,500 manufacturers, distributors, of equipment for commercial fruit industry.

VII. PROFSSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.
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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

WALNUT VENEER

I. P. No. 67295
S. I. C. 2432

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WALNUT VENEER

PRODUCT DESCRIPTION

This plant will produce any kind of veneer : mahogany, birds eye maple, walnut and many others. The figures shown in this profile are based on walnut veneer.

A. GENERAL EVALUATION OF PROSPECTS

Skilled labor requirements for this plant are rather low. This industry should be established only where suitable logs are available for making veneer. Where this is the case, manufacture for export as well as for domestic consumption is a possibility. If production conditions are favorable, the prospects for this industry should generally be good.

B. MARKET ASPECTS

1. USERS

Veneers are used in the woodworking industry, principally the furniture industry.

2. SALES CHANNELS AND METHODS

Sales would be made direct to furniture factories and other users. Veneers are easily handled and transport charges are not especially burdensome. The potential domestic market would encompass furniture factories which are usually located close to urban areas. The domestic market would be nationwide. Veneer production requires a considerable investment and plywood cannot be produced without an efficient plant of considerable cost. Unless other plants producing veneer already exist within the country, no domestic competition can be expected. A worldwide market exists for veneers. Although this plant is small, if a high quality product is made, there should be opportunities for doing some export business in countries where overseas trading facilities are reasonably well organized. The domestic market cannot be measured by population since sales will depend primarily on the number of furniture factories located within the country.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $580,000.
The total fixed investment, plus working capital, is estimated at $435,400.
The annual gross profit, before taxes, is estimated at $57,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 9.8%.
(A gross profit on sales, before taxes, of 9.8%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, would amount to about 13.1%.

5. COST PER MAN EMPLOYED

Thirty-five direct workers and seven indirect workers, or a total of forty-two, are employed.
The total fixed capital investment is estimated at $337,000.
Based on these figures, the fixed investment per man employed would amount to about $8,025.

C. PRODUCTION REQUIREMENTS WALNUT VENEER — I.P. No 67295
ANNUAL CAPACITY - ONE SHIFT OPERATION: 7,000,000 SQUARE FEET — S.I.C. 2432
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - about 5 acres	
Building - one story 19,000 sq. ft.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 337,000

Principal items:
Log Saw, Log Boiling Vats, Log Hoist and Monorail, Veneer Laths, Steam Engine, 2 Veneer Conveying Tables, Wet Veneer Clipper, Veneer Dryer, 2 Veneer Sizing Clippers, Venner Veneer Jointer, 2 Veneer Splicers

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 98,400
c. Total Capital Requirements	$ 435,400

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Logs in quantity sufficient to meet plant's annual veneer production capacity		
Packaging		
Total direct materials		$ 170,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 10,100

c. Availability of materials & supplies
All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 120 H.P. connected load	
Fuel - Scrap wood used	
Water - About 2 million gals. per year	$ 3,300

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 28,600

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	3	
Maintenance	1	
Truck Driver	1	
Total indirect labor	7	$ 50,000
b. Direct labor		
Skilled workers	4	
Semi-skilled workers	15	
Unskilled workers	16	
Total direct labor	35	$ 156,600

c. Training Needs
The manager with the supervisor and four skilled workers should be able to train all workers and reach full production in thirt days

6. TRANSPORTATION

a. Own transport equipment
Truck

b. External transport facilities
The logs and the finished product are both bulky.
The plant should be located on a railroad.

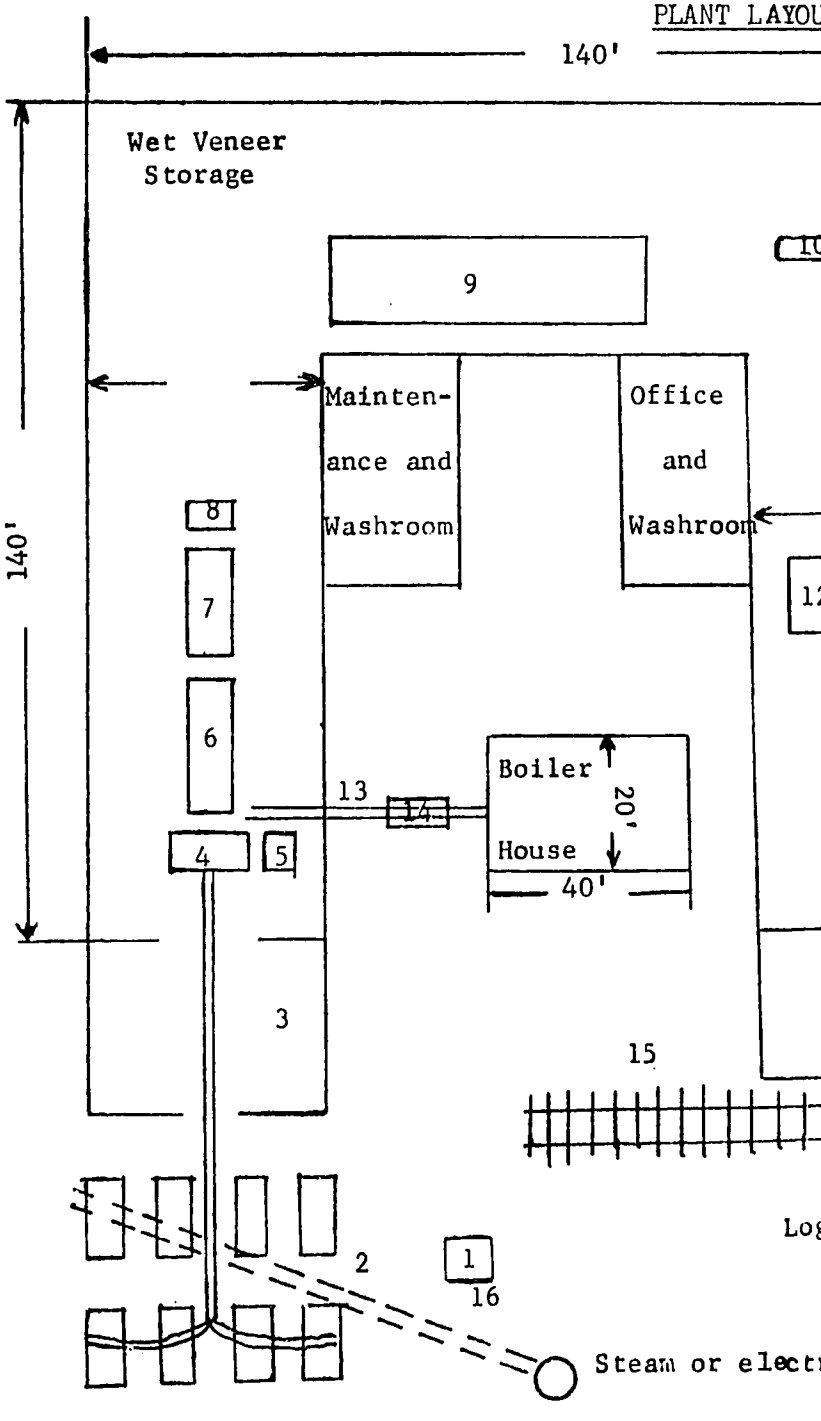
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 170,000	
Direct labor	156,600	
Manufacturing overhead*	92,000	
Total manufacturing cost		$ 418,600
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 50,400
Sales expense		30,000
Freight-out, travel discounts Allowances & bad debts		$ 24,000
Total annual costs		$ 523,000
Annual Gross Profit		$ 57,000
ANNUAL SALES REVENUE		$ 580,000

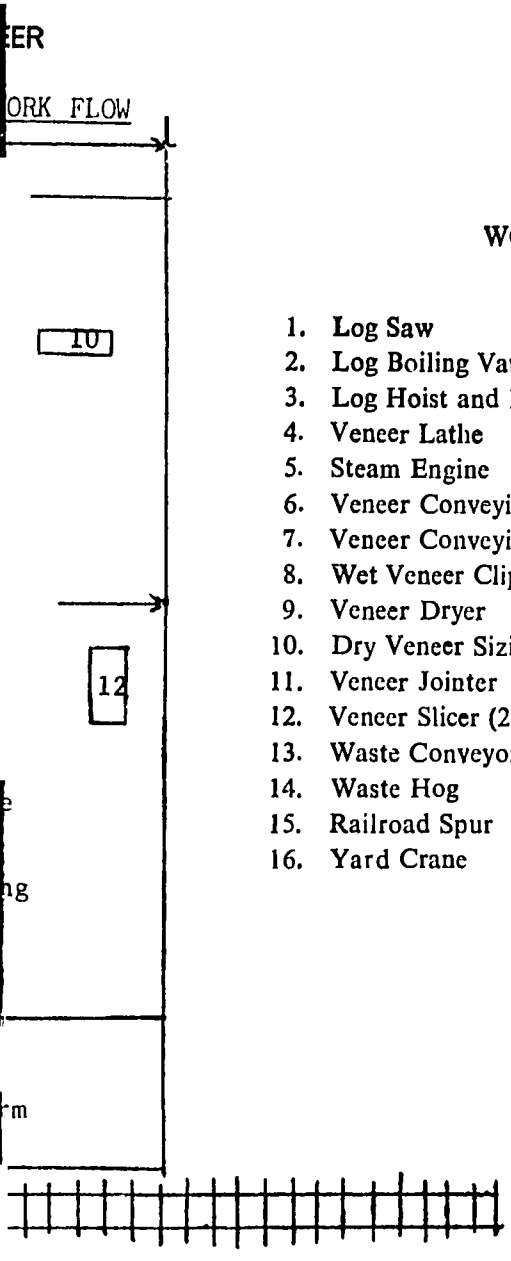
*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

WALNU

PLANT LAYOU



I. P. NO. 67295
S. I C. 2432



WORK FLOW

1. Log Saw
2. Log Boiling Vats
3. Log Hoist and Monorail
4. Veneer Lathe
5. Steam Engine
6. Veneer Conveying Table
7. Veneer Conveying Table
8. Wet Veneer Clipper
9. Veneer Dryer
10. Dry Veneer Sizing Clippers (2)
11. Veneer Jointer
12. Veneer Slicer (2)
13. Waste Conveyor
14. Waste Hog
15. Railroad Spur
16. Yard Crane

I.P. No. 67295
S.I.C. 2432

WALNUT VENEER

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Wood Machining Processes. Peter Koch. 1964. 530 pp. Illus. $15.00

The Ronald Press Company
79 Madison avenue
New York, N.Y. 10016

B. Veneering and Wood Bending in the furniture industry. W. Clark. $5.50

Pergamon Press, Inc.
44-01 - 21st Street
Long Island City, New York 11101

C. Types of Plywood and Veneers, Woodworking Digest, Technical Series. Reprint No. 104. Thomas D. Perry. 1955. 84 pp. $1.00

Hitchcock Publishing Company
Wheaton, Illinois 60187

Devoted to veneers and plywood.

II. TECHNICAL AND TRADE PERIODICALS

A. Plywood Magazine. Monthly. $6.00/year

James F. Burrell
1100 Waterway Blvd.
Indianapolis, Indiana 46207

Woodworking and plywood manufacturing, utilization, and marketing.

B. Woodworking Digest. Monthly. $5.00/year.

Hitchcock Publishing Company
Wheaton
Illinois 60188

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Manage nent Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

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Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3,106,500. October 8, 1963. 4 p.
Wood veneered panel and process of making same.

B. Patent No. 3,202,207. February 20, 1962. 3 p.
Method of producing decorative wall panels.

C. Patent No. 3,011,932. December 5, 1961. 4 p,
Adhesive bearing strip veneer material, its mauufacture and application.

D. Patent No. 3,224,919. December 21, 1965. 4 p.
High speed veneering process.

E. Patent No. 3,133,850. May 19, 1964. 20 p.
Continuous process of manufacture of veneered wood.

F. Patent No. 3,084,090. April 2, 1963. 9 p.
Mannfacture of strip veneer.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Flat Veneer Products Association
441 Lexington Avenue
New York, New York 10017

B. Hardwood Plywood Institute
2310 South Walter Reed Drive
Arlington, Virginia 22206

VI. DIRECTORIES

A. Hitchcock's Wood Working Directory and Handbook. Aunual. $15.00

Hitchcock Publishing Company
Wheaton, Illinois 60188

List producers of furniture, plywood, veneer, and other wood products and machinerp manufacturers for the industry.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reacheed through their national organizations, one of which is the :

National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

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GENERAL INFORMATION

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This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

WASH TUBS AND PAILS

I. P. No. 67296
S. I. C. 3441

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67296
S.I.C. 3441
DECEMBER 1967

WASH TUBS AND PAILS

PRODUCT DESCRIPTION

Galvanized wash tubs and pails. The pails are made in three sizes: 12 quart, 14 quart and 16 quart. The tub holds 18 gallons of water and is 32 inches in diameter and 11 inches deep. The ears on the pails and the handles on the tubs are riveted on.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend on local conditions. Where water is piped into homes, the need for pails will be greatly reduced. Also, where wash-water is piped into homes, the need for wash tubs will be greatly reduced. The fixed capital investment required for this plant is modest in relation to the annual gross sales and the annual gross profits It is recommended that a comprehensive feasibility survey be conducted including the sales potential, the availability of materials, and all other factors pertaining to this industry.

B. MARKET ASPECTS

1. USERS

Homes, stores, business establishments, ships, military installations, wherever floors are scrubbed and clothes are washed.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are usually made to retail stores and direct to large users such as the military. The market needed to support this industry depends on the availability of piped-in water and of washing machines. These products are well packaged and not difficult to transport. The cost of transportation will not prohibit nationwide distribution. While these products are sometimes produced in small shops with hand tools and equiment, this industry would have no difficulty in meeting such competition since its production costs will be lower, per unit, and its quality much better. These products are sold worldwide but a plant of the capacity outlined in tois profile would not be able to compete in world markets. But it is certainly able to compete with imported products since it enjoys a freight advantage and, most likely, an import duty advantage.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognised that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $220,000.
The total fixed investment, plus working capital, is estimated at $134,000.
The annual gross profit, before taxes, is estimated at $24,000.
Using these figures, the profit on gross sales, before taxes, amounts to 10.9%.
(A gross profit on sales, before taxes, of 10.9%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 17.9%.

5. COST PER MAN EMPLOYED

Eleven direct and six indirect workers, or a total of seventeen workes, are employed.
The total fixed capital investment is estimated at $97,000.
Based on these figures, the fixed investment per man employed would amount to about $5,700.

C. PRODUCTION REQUIREMENTS WASH TUBS AND PAILS — I.P. No. 67296
ANNUAL CAPACITY - ONE SHIFT OPERATION : 40,000 TUBS, 40,000 PAILS — S.I.C. 3441

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital — Cost

Land - 1/2 acre	
Building - one story 60' x 60'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 97,000

Principal Items :

Square Shear, 2 Presses 45-tons single geared, Former Rolls, Beading and Flanging Machine, Side Seamer, Bottom Seamer, Wire Former, Pivoting Machine, Drill Press, Tanks for Pickling and Rinsing, Galvanizing Trucks and Skids, Dies

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 37,000

c. Total Capital Requirements — $134,000

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Steel wire, 16 gauge	3 tons	
Steel cold rolled sheet	150 tons	
Zinc-prime western	60 tons	
Chemicals		
Packaging		
Total direct materials		$ 47,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil and maintenance for truck	
Total supplies	$ 3,600

c. Availability of materials & supplies

Some materials may have to be imported. All are available in world markets.

3. POWER, FUEL AND WATER

a.	Annual Cost
Electric Power - 60 H.P. connected load Fuel - Production and heating Water - Production, sanitation and fire protection	$ 3,200

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 9,400

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Chemist-Foreman	1	
Office	2	
Maintenance	1	
Truck Driver	1	
Total indirect labor	6	$ 45,000
b. Direct Labor		
Skilled workers	3	
Semi-skilled workers	5	
Unskilled workers	3	
Total direct labor	11	$ 53,800

c. Training Needs

The manager and foreman should be fully experienced. Foreman should be a chemist. They, with the help of three skilled workers, should be able to train all workers and reach full production in three weeks.

6. TRANSPORTATION

a. Own transport equipment.

Truck

b. External transport facilities.

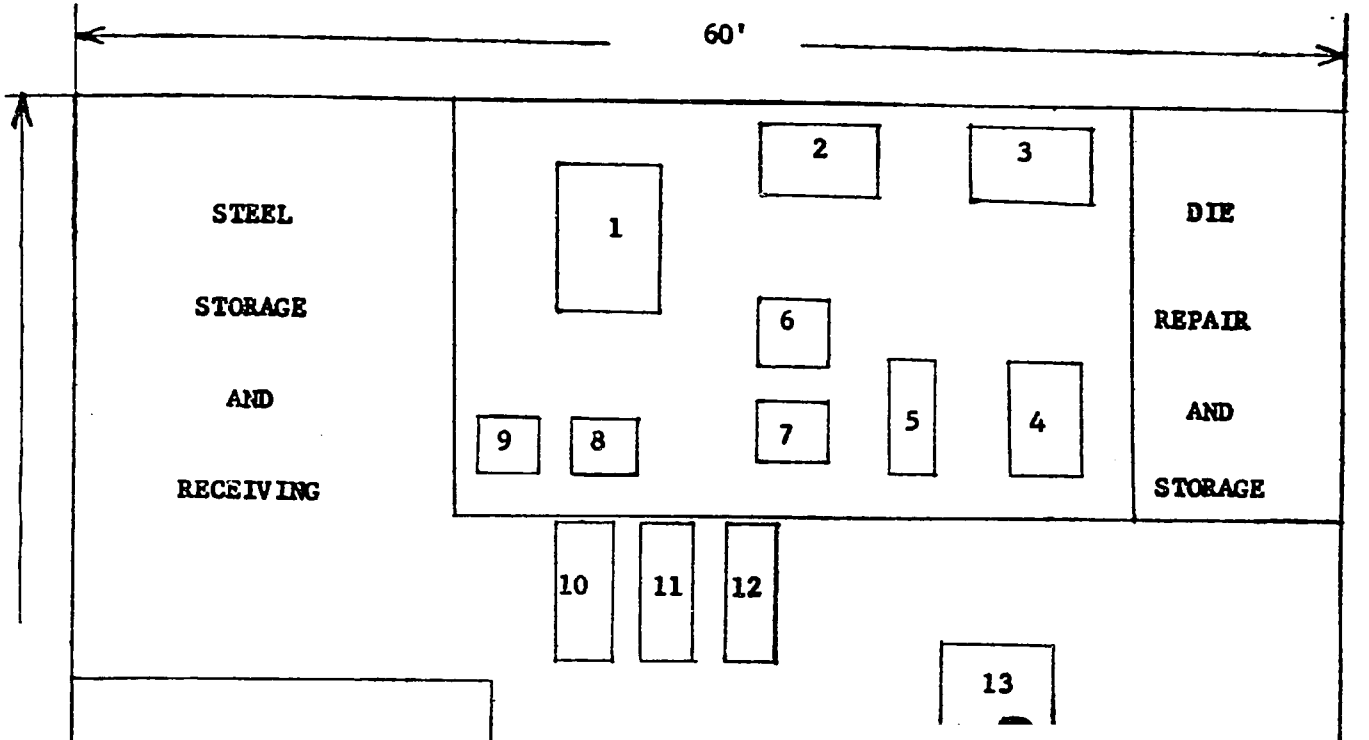
In and out shipments less than one ton per day. Good highways.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

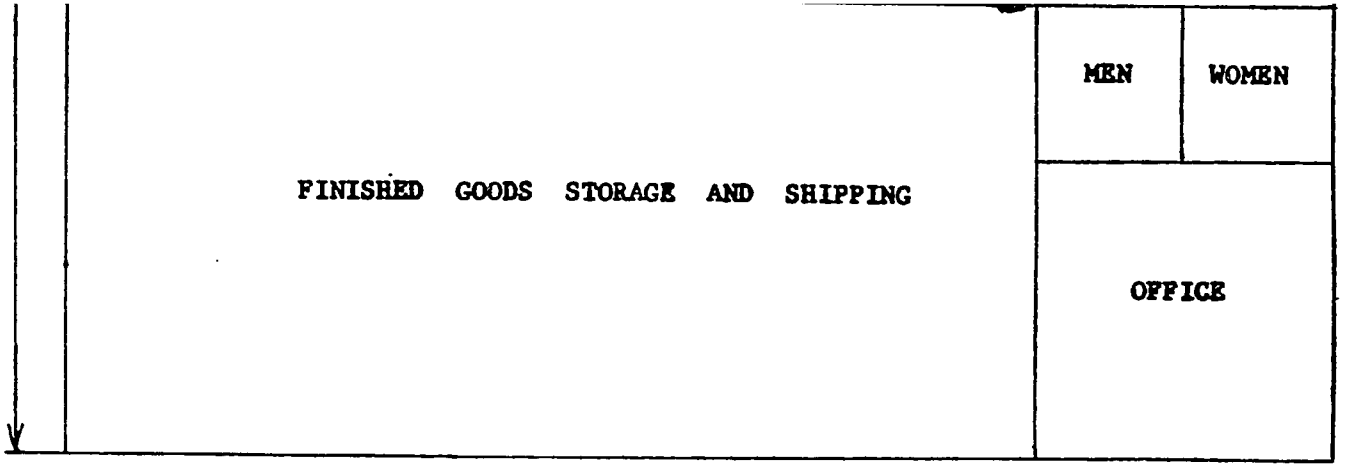
Direct materials	$ 47,000	
Direct labor	53,800	
Manufacturing overhead*	61,200	
Total manufacturing cost		$162,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 17,000
Sales expense		$ 12,000
Freight-out, travel discounts Allowances & bad debts		$ 5,000
Total annual costs		$196,000
Annual Gross Profit		$ 24,000
ANNUAL SALES REVENUE		$220,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect Labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

PLANT LAYOUT



WASH TUB



SCALE: 1/8" = 1'

KEY

1. Shear
2. Press - 45 ton
3. Press - 45 ton
4. Forming rolls
5. Beading and flanging machine
6. Side seamer
7. Bottom seamer
8. Riveting machine
9. Wire former
10. Degrease tank
11. Pickle tank
12. Rinse tank
13. Galvanizing kettle

I.P. No. 67296
S.I.C. 3441

WASH TUBS AND PAILS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Sheet Metal Practice. W. Neundorf and C. Stevens. 1963. 90 pp. Illus. $2.95

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Devoted to the fabrication of sheet metal.

II. TECHNICAL AND TRADE PERIODICALS

A. Metal Finishing. Monthly . $5.00/year.

Metal and Plastics Publications, Inc.
99 Kinderkamack Road
Westwood, New Jersey 07675

Such operations as polishing, buffiing, cleaning, and plating of metal products.

III. BUSINESS MANAGEMENT MATERIALS

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U. S. Government Printing Office
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Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

D. Starting and Managing a Small Business of Your Own. Wendell O. Metcalf. 49 pp. 1962. $.25. Vol. I (2nd Edition) of the Starting and Managing Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Pitfalls usually encountered when entering a new business. Sources of additional information given.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231 $.50 each.

A. Patent No. 3,129,436. April 21, 1964 4 p.
Utility tub construction.

B. Patent No. 2,907,052. October 6, 1959 6 p.
Tub type apparatus for washing and rinsing.

C. Patent No. 2,684,175. July 20, 1954 4 p.
Drain tub assembly,

D. Patent No. 2,865,041. December 23, 1965 4 p.
Fluid container assembly.

E. Patent No. 2,511,707. June 30, 1950 4 p.
Tubs for washing and rinsing.

F. Patent No. 2,500,490. March 14, 1966 3 p.
Laundry tub and apparatus.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. American Hardware Manufacturers Association
342 Madison Avenue
New York, New York 10017

B. National Housewares Manufacturers Association
1130 Marchandise Mart
Chicago, Illinois 60654

VI. DIRECTORIES

A. Housewares Directory. Annual. $1.00.

Haire Publishing Company
111 Fourth Avenue
New York, New York 10003

Lists all U. S. manufacturers of houseware and hardware products and their suppliers.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

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INDUSTRY PROFILES

SELF—SERVICE LAUNDRY

I. P. No. 67297
S. I. C. 7215

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I. P. No. 67297
S. I. C. 7215
DECEMBER 1967

SELF-SERVICE LAUNDRY

PRODUCT DESCRIPTION

Washing and drying of flat work and apparel.

A. GENERAL EVALUATION OF PROSPECTS

The plant described contains mechanical laundry equipment for washing and spin drying. For heat drying, special dryers are provided. These machines are all coin operated and since the establishment is kept open long hours and the owner is not there all of the time, money-changing machines are provided as well as a coin-operated soap and bleach dispenser. However, most customers bring their own soaps and bleaches. In the United States, one man sometimes establishes and operates more than one of these businesses within a city. They usually permit companies to install soft drink and cigarette coin-operated vending machines on a percentage basis.

B. MARKET ASPECTS

1. USERS

People who do not have their own laundry equipment.

2. SALES CHANNELS AND EXTENT OF MARKET

Laundry should be located in active shopping areas. People bring in their laundry, wash and dry it themselves and take it away with them. The market is entirely within the area where it is located. Self-service laundries are established only in urban areas and, usually, in a rented building located in an active shopping area. The only competition that could be encountered would stem from mechanical laundries or from individuals doing laundry work. However, the cost of individual laundry service or of purchasing service from a commercial laundry establishment usually exceeds the cost of self-service laundry. There is no possibility of exporting this service.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $20,000.
The total fixed investment, plus working capital, is estimated at $20,400.
The annual gross profit, before taxes, is estimated at $4,600.
Using these figures, the profit on gross sales, before taxes, amounts to 23%.
(A gross profit on sales, before taxes, of 23%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at 22.5%.

5. COST PER MAN EMPLOYED

One direct and no indirect workers, or a total of one worker, is employed.
The total fixed capital investment is estimated at $17,400.
Based on these figures, the fixed investment per man employed would amount to $17,400.

C. PRODUCTION REQUIREMENTS SELF SERVICE LAUNDRY — I.P. No. 67297
ANNUAL CAPACITY - OPERATING 14 HOURS PER DAY: 20,000 GROSS SALES — S.I.C. 7215

NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - none	
Building - one story 20' x 60' rented	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 17,400

Principal items:

20 Washing Machines, 15 lb. coin operated
6 Drying Machines, 50 lb. coin operated
2 Money Changers
1 Soap Dispenser, coin operated

b. Working Capital (30 days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 3,000

c. Total Capital Requirements $ 20,400

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
No direct materials. Soap is obtainable from a coin operated machine, but most customers bring their own soap.		
Total direct materials		$ -0-

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Rent of building	
Total supplies	$ 4,260

c. Availability of materials & supplies

All should be available locally, All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 15 H.P.	
Fuel - Heat and hot water	
Water - Quantity sufficient to operate machines	
	$ 2,400

4. DEPRECIATION

	Yrs. life	Amount
Building	0	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Total depreciation		$ 1,740

5. MANPOWER

	Number	Annual Cost
a. Indirect labor		
	0	
Total indirect labor	0	$ -0-
b. Direct labor		
Skilled workers, owner	1	
Semi-skilled workers	0	
Unskilled workers	0	
Total direct labor	1	$ 6,000

c. Training Needs

No special skill required. Owner opens up in the morning and cleans up and locks up at night.

6. TRANSPORTATION

a. Own transport equipment

None

b. External transport facilities

All materials to be washed are brought in and taken away by the customer.

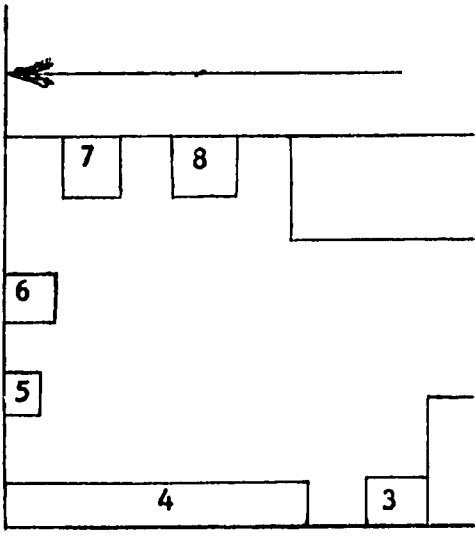
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ -0-	
Direct labor	6,000	
Manufacturing overhead*	8,400	
Total manufacturing cost		$ 14,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 1,000
Sales expense		$ -0-
Freight-out, travel discounts Allowances & bad debts		$ -0-
Total annual costs		$ 15,400
Annual Gross Profit		$ 4,600
ANNUAL SALES REVENUE		$ 20,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

SELF-SERVICE

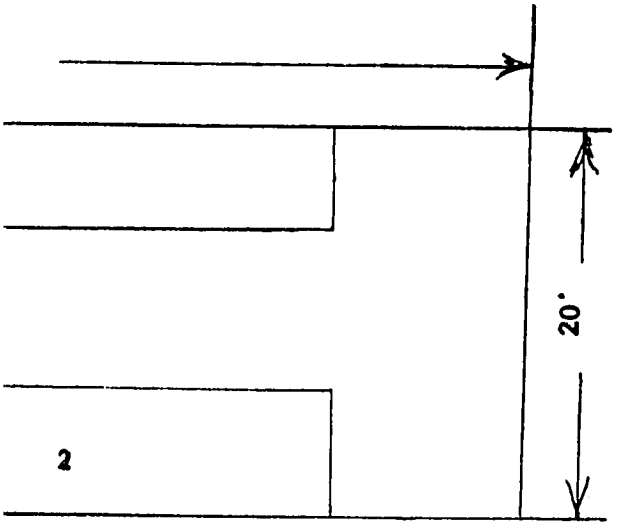
PLANT



1. WASH & SPIN DRY MAC
2. HOT AIR DRYERS
3. SOAP & BLEACH COIN M
4. SEATS

I. P. NO. 67297
S. I. C. 7215

OUT



5. MONEY CHANGER
6. CANDY BAR MACHINE
7. CIGARETTE MACHINE
8. SOFT DRINK MACHINE

I.P. No. 67297
S.I.C. 7215

SELF-SERVICE LAUNDRY

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. The Laundry and Drycleaning Industry; a Study of Problems and Prospects. Business and Defence Services Administration, U.S. Department of Commerce. 94 pp. Illus. 1965. $.35

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Analysis of laundry and cleaning trades; shows changes in the market for these services. Also lists additional references and other source materials.

II. TECHNICAL AND TRADE PERIODICALS

A. American Laundry Digest. Monthly. $3.00/year.

American Trade Magazines
500 North Dearborn Street
Chicago, Illinois 60610

B. Coin Launderer and Cleaner. Monthly. $3.00/year

Walter Turrentine, Publisher
75 Third Street, N.W.
Atlanta, Georgia 30308

C. NALCC News. Monthly. Free to members.
NALCC Management Guidelines. Monthly. Free to members. Both published by :

National Automatic Laundry and Cleaning Council
7 South Dearborn Street
Chicago, Illinois 60603

III. BUSINESS MANAGEMENT MATERIALS

A. The First Two Years: Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

B. Starting and Managing a Small Business of Your Own. Wendell O. Metcalf. 49 pp. 1962 $.25. Vol. I (2nd Ed.) of the Starting and Managing Series of the Small Business Administration, Washington, D.C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Pitfalls usually encountered when entering a new business. Lists sources of additional information.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (7th Ed.)

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Points out major areas of financial management and describes a few of the techniques that can help businessmen understand past decisions and to help them make better decisions

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each

A. Patent No. 3,283,548. November 8, 1966. 17 p.
Dry cleaning machine.

B. Patent No. 3,269,154. August 30, 1966. 6 p.
Clothes Washing machine.

C. Patent No. 3,269,153. August 30, 1966. 17 p.
Automatic washing machine.

D. Patent No. 3,256,692. June 21, 1966. 10 p.
Laundry control system and selector mechanism.

E. Patent No. 3,254,513. June 7, 1966. 14 p.
Conrtol system for automatic dry cleaning machines.

F. Patent No. 3,250,097. May 10, 1966. 17 p.
Dry cleaning machine.

G. Patent No. 2,990,706. 1961. 8 p.
Combination washer ahd dryer.

H. Patent No. 2,986,914 1961. 20 p.
Clothes washer and dryer.

I. Patent No. 2,975,626. 1961. 13 p
Washing machine having a centrifugal washer and dryer.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Association of Coin Laundry Equipment Operators, Inc.
507 Maryland Trust Building
Baltimore, Maryland 21202

B. Laundry and Cleaners Allied Trades Association
1180 Raymond Boulevard
Newark, New Jersey 07102

VI. DIRECTORIES

A. Membership Roster - American Institute of Laundering. No price given.

Ameri an Institute of Laundering
Drawer 1187
Joliet, Illinois 60434

Lists laundry firms, suppliers, and allied trade members.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

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National Society of Professional Engineers
2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

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Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

METAL LOCKERS

I. P. No. 67298
S. I. C. 2542

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

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The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No 67298
S.I.C. 2542
DECEMBER 1967

METAL LOCKERS

PRODUCT DESCRIPTION

Metal lockers with one shelf and clothes hooks, door handles, hinges and lock. Other cabinets for various purposes, including filing cabinets, can be produced in this plant.

A. GENERAL EVALUATION OF PROSPECTS

The prospects for this industry will depend to a great extent on the amount of activity by government, military, industry, commercial and professional business conducted within the country. In some countries these cabinets are made of wood, which presents a potential fire hazard. Therefore, if metal cabinets are available locally, they should be preferred by most potential purchasers. If sales of about 10,000 cabinets are available annually, this industry should represent a good investment.

B. MARKET ASPECTS

1. USERS

Government offices, military, commercial businesses, professional businesses, industry, schools, offices of all kinds.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would be made direct to office equipment stores and to government and military agencies. The extent of the market for metal lockers would be nationwide. If the industry is efficiently managed and operated, it should have no difficulty in competing with imported products. However, it would not be able to compete in world markets with large mass-production plant. Local competition could come from manufacturers of wooden or metal cabinets, if such plants exist within the country. In any event, a comprehensive survey should be conducted to determine existing competition and sales potential.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requiremens" on the next page illustrates typical U.S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial production costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Such elements and relationships therefore would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $180,000.
The total fixed investment, plus working capital, is estimated at $104,000.
The annual gross profit, before taxes, is estimated at $17,000.
Based on these figures, the profit on gross sales, before taxes, amounts to about 9.5%.
(A gross profit on sales, before taxes, of 9.5%, while reflecting U.S. experience should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, would amount to 16.3%.

5. COST PER MAN EMPLOYED

Ten direct workers and five indirect worker or a total of 15 workers, are employed.
The total fixed capital investment is estimated at $74,000.
Based on these figures, the fixed investment per man employed would amount to about $4,930.

C. PRODUCTION REQUIREMENTS - METAL LOCKERS — I.P. No. 67298
ANNUAL CAPACITY - ONE SHIFT OPERATION: 10,000 UNITS — S.I.C. 2542
NOTE: COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - one-half acre	
Building - one story 50' x 80'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 74,000

Principal items :
Square shears
Sheet metal brake
Punch press
Drill press
Welding equipment
Bench grinder
Spray booth compressor
Dies
Factory truck

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 30,000
c Total Capital Requirements	$ 104,000

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
Sheet steel	220 tons	
Hardware including hinges, handles and locks	10,000 sets	
Enamel		
Cartons		
Total direct materials		$ 43,000

b. Supplies	
Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Gas, oil & maintenance of truck	
Total supplies	$ 3,900

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 40 H.P.	
Fuel - heating, as required	
Water - sanitation and fire protection	$ 1,400

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Truck	4	
Total depreciation		$ 6,700

5. MANPOWER

a. Indirect labor	Number	Annual Cost
Manager	1	
Foreman	1	
Office	2	
Truck driver	1	
Total indirect labor	5	$ 35,000
b. Direct labor		
Skilled workers	3	
Semi-skilled workers	2	
Unskilled workers	5	
Total direct labor	10	$ 46,000

c. Training needs

The manager and 2 skilled workers should be able to train all workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

One truck

b. External transport facilities

In and out shipments about 2 tons per day.
Good highways

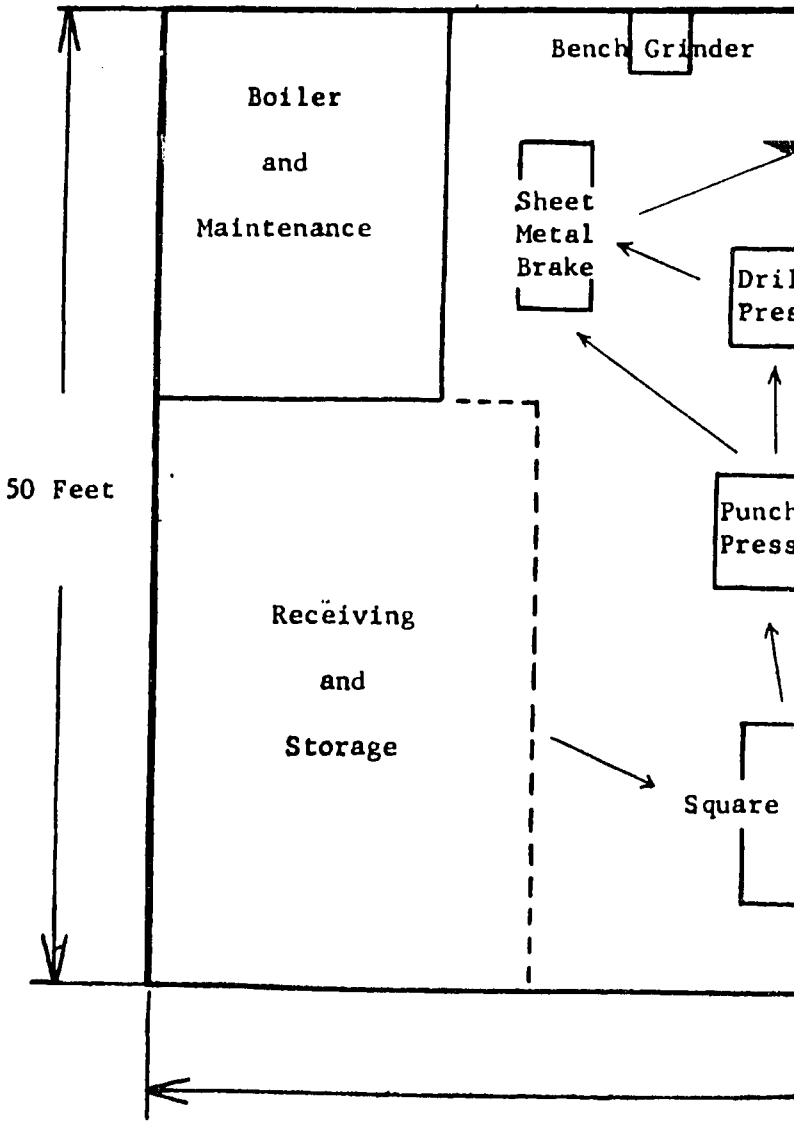
7. TOTAL ANNUAL COSTS AND SALES REVENUE

Direct materials	$ 43,000	
Direct labor	46,000	
Manufacturing overhead*	47,000	
Total manufacturing cost		$ 136,000
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 12,000
Sales expense		$ 10,000
Freight-out, travel discounts Allowances & bad debts		$ 5,000
Total annual costs		$ 163,000
Annual Gross Profit		$ 17,000
ANNUAL SALES REVENUE		$ 180,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors. The totals shown are the sums of the average costs used.

MET

PLANT LA


Bench Grinder
Boiler
and
Maintenance
Sheet
Metal
Brake
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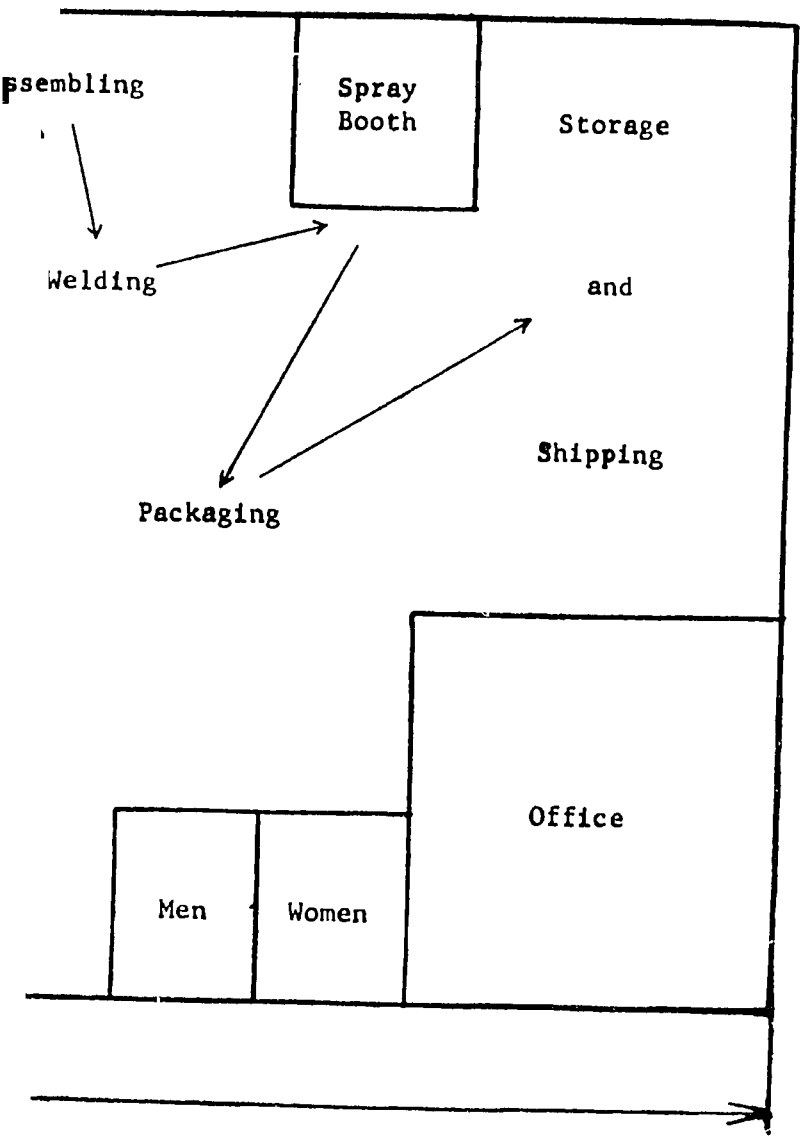
and
Storage
Square

CKERS

I. P. NO. 67298
S. I. C. 2542

ND WORKFLOW



METAL LOCKERS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Interiors Book of Offices. L. W. Green. 1959. 163 pp. Price not given.

Hill and Wang
141 Fifth Avenue
New York, New York 10010

Includes data on wooden and metal filing cabinets.

B. Sheet Metal Shop Practice. L. F. Bruce. 1951. 251 pp. Illus. $4.00

American Technical Society
848 East 58th Street
Chicago, Illinois 60615

Describes materials and operations used in the production of metal filing cabinets.

C. Metalwork Technology and Practice. O. A. Ludwig. 1955. 399 pp. Illus. $4.00

McKnight and McKnight Publishing Company
Towanda Avenue and Route 66
Bloomington, Illinois 61701

Basic information on tools, materials, and operations that apply to metal filing cabinet manufacture.

II. TECHNICAL AND TRADE PERIODICALS

A. Geyer's Dealer Topics. Monthly. $3.00/year.

Geyer-McAllister Publications
212 Fifth Avenue
New York, New York 10010

Dealer's magazine featuring office machines and equipment.

B. Business Products. Monthly. $10.00/year to non-members. $6.00/year to members.

National Stationery and Office Equipment Association
740 Investment Building
Washington, D. C. 20005

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $0.20

Small Business Management Series No. 4
U.S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S. Patent Office, Washington, D. C. 20231. $.50 each.

A.	Patent No. 3,248,175. Knocked down cabinet.	April 26, 1966	11 p.
B.	Patent No. 3,269,791. Construction of wardrobes and other metal furniture.	August 30, 1966	7 p.
C.	Patent No. 3,275,394. Frame construction design.	September 27, 1966	11 p.
D.	Patent No. 3,006,709. Collapsible cabinet.	October 1961	5 p.
E.	Patent No. 2,884,298. Interlock device.	April 28, 1959	5 p.
F.	Patent No. 2,885,257. Filing cabinet drawer lock.	May 5, 1959	3 p.
G.	Patent No. 2,912,271. Door latch mechanism.	November 10, 1959	6 p.
H.	Patent No. 2,784,045. Method of making filing cabinets.	1957	17 p.
I.	Patent No. 2,692,811. Process for making filing cabinet.	1954	4 p.
J.	Patent No. 2,676,865. Filing cabinets and drawer construction cabinet.	1954	3 p.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. National Stationery and Office Equipment Association
740 Investment Building
Washington, D, C. 20005

B. Business Equipment Manufacturers Association
Pfizer Building, Room 620
235 East 42nd Street
New York, New York 10017

VI. DIRECTORIES

A. Who's Who in Office Products Industry. Annual. $10.00

National Stationery and Office Equipment Association
740 Investment Building
Washington, D. C. 20005

Lists U.S. manufacturers, dealers, wholesalers of office products, equipment and machines.

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Technical Information, 410.12
Springfield, Virginia 22151

Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

This *Industry Profile* was prepared for the U. S. Agency for International Development by International Development Services Inc., Washington, D. C.

INDUSTRY PROFILES

10—HORSEPOWER UTILITY RIDING TRACTORS

I. P. No. 67299
S. I. C. 3522

Industry Profiles are intended to promote the development of private industry in the developing countries by assembling economic and technical information in a professional analysis to support basic decisions in the establishment of small or medium-scale plants in a specific industry. The information contained in a profile is selected and organized for the guidance of the entrepreneur in the less developed country.

Industry Profiles contain basic information on market aspects, production rates, capital requirements, materials and supplies, utilities, manpower operating costs and sales revenues. Work-flow diagrams and, in some instances, machinery layouts are included along with references to sources of technical information, professional services, patents, materials and equipment.

The profiles adopt as a benchmark, productivity rates and costs which could be anticipated under conditions prevailing in the United States. Anticipated profits are before taxes. Since conditions vary widely from country to country, the entrepreneur using this profile must make suitable adjustments to conditions prevailing in his country, This profile should help in reaching correct assumptions.

I.P. No. 67299
S.I.C. 3522
DECEMBER 1967

10-HORSEPOWER UTILITY RIDING TRACTORS

PRODUCT DESCRIPTION

Utility tractors consist of a gasoline engine power plant, a gear coupled to the driving axle through differential gears and a power take-off enabling them to operate a wide variety of accessories such as mowing cutter bars, rotary mowers, plows, harrows, seeders, sprayers. Such accessories are not included with the tractors but are assembled from purchased components.

A. GENERAL EVALUATION OF PROSPECTS

This plant requires a fairly large investment, a moderate amount of skilled labor and good management to assure product quality and efficient after-sale service. It is essentially only an assembly plant and its ability to compete with large-scale tractor producers will depend on obtaining components at a reasonable price plus a cheap and efficient labor force. The advantage of a local tractor-producing plant lies in the capability of marketing, servicing and educating potential users rather than in the plant's manufacturing capabilities. The prospects for a well-run plant are good in developing areas where mechanization of agriculture is being energetically encouraged. A feasibility survey should be conducted to determine the availability and cost of materials and the sales potential.

B. MARKET ASPECTS

1. USERS

Small farms, estates, golf courses, industrial plants, public utilities, public and private institutions, cemeteries, parks, municipal, state and government ground maintenance agencies.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales are generally made to farm equipment distributors and tractor distributors and sometimes to farmers' cooperatives and large users such as government agencies. The enterprise should cooperate with distributors in stimulating the use of tractors. This product is bulky, heavy and difficult to handle but the unit value is high enough to support transport costs over a wide area. Competition from foreign producers presently supplying the area will continue but a lower labor rate plus lower shipping costs and ease of repair service from factory location should help the manufacturer meet competition. This plant could not expect to compete in world markets with large mass-production tractor plants.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $7,550,000.
The total fixed investment, plus working capital, is estimated at $914,000.
The annual gross profit, before taxes, is estimated at $290,000.
Based on these figures, the profit on gross sales, before taxes, would amount to about 11.3%. (A gross profit on sales, before taxes, of 11.3%, while reflecting U.S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on total capital requirements, before taxes, would amount to about 31.7%.

5. COST PER MAN EMPLOYED

Thirty-eight direct workers and eight indirect workers, or a total of forty-six workers are employed.
The total fixed capital investment is estimated at $351,000.
Based on these figures, the fixed investment per man employed would amount to about $7,630.

C. PRODUCTION REQUIREMENTS - 10-HORSEPOWER UTILITY RIDING TRACTORS

I.P. No. 67299
S.I.C. 3522

ANNUAL CAPACITY - ONE SHIFT OPERATION: 10,000 TRACTORS

NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital

	Cost
Land - about one acre	
Building - one story 100' x 150'	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 351,000

Principal items:

2 punch presses	Horizontal milling machine
Sheet metal shear	Grinding equipment
Press brake	Alligator shears
Power saw	Die shaper
Band saw	Paint booths
2 screw machines	Welding equipment
Turret lathe	Assembly fixtures
2 multi-spindle & 3 single spindle drill presses	5-ton truck
Deburr & degreasing equipment	

b. Working Capital (30-60 Days)

Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 914,000

c. Total Capital Requirements $

2. MATERIALS AND SUPPLIES

a. Direct materials	Annual Requirements	Annual Cost
10 H.P. gas engines	10,000	
Steel sheets & shapes	1,000 tons	
Hot-rolled rounds & flats	250 tons	
Differential gears	10,000 units	
Wheels	40,000	
Pneumatic tires & tubes	20,000	
Solid tires	20,000	
Hardware		
Solvents, cleaners, paints & finishes		
Packaging		
Total direct materials		$ 1,777,000

b. Supplies

Lubricants & hand tools	
Cutting tools & abrasives	
Maintenance & spare parts	
Office supplies	
Welding supplies	
Gas, oil & maintenance of truck	
Total supplies	$ 23,000

c. Availability of materials & supplies

All should be available locally.
All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 200 H.P. connected load	
Fuel - about 50,000 gals. Bunker C oil.	
Water - about 2 million gals.	
	$ 9,500

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 31,700

5. MANPOWER

	Number	Annual cost
a. Indirect labor		
Manager	1	
Supervisor	1	
Office	3	
Maintenance	2	
Truck Driver	1	
Total indirect labor	8	$ 57,000
b. Direct labor		
Skilled workers	6	
Semi-skilled workers	10	
Unskilled workers	22	
Total direct labor	38	$ 165,200

c. Training needs

Manager and supervisor should be fully experienced. They with 3 skilled workers should be able to train all workers and reach full production in 30 days.

6. TRANSPORTATION

a. Own transport equipment

One truck

b. External transport facilities

Good highways essential.

7. TOTAL ANNUAL COSTS AND SALES REVENUE

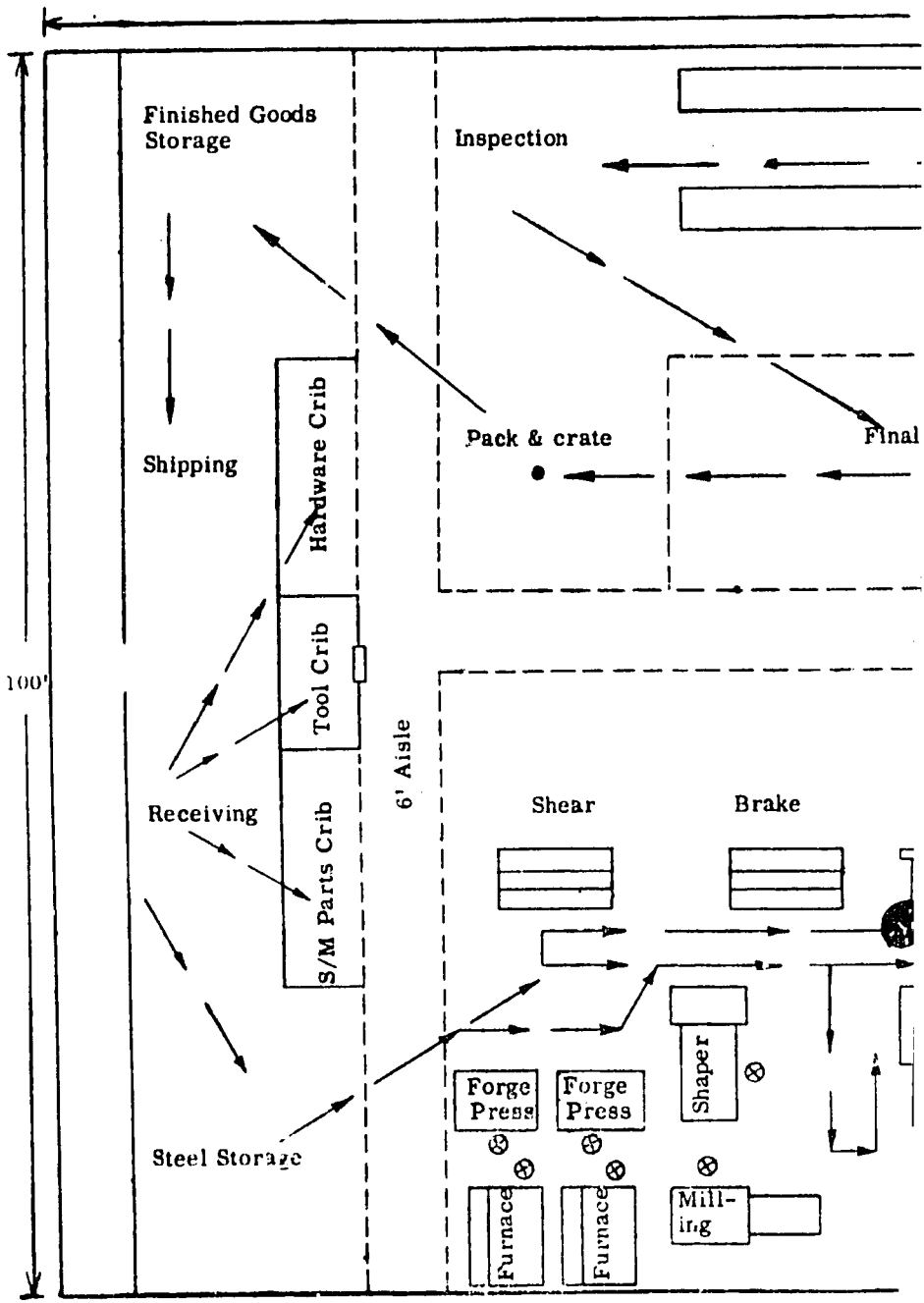
Direct materials	$ 1,777,000	
Direct labor	165,200	
Manufacturing overhead*	121,200	
Total manufacturing cost		$ 2,063,400
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 86,600
Sales expense		$ 60,000
Freight-out, travel discounts Allowances & bad debts		$ 50,000
Total annual costs		$ 2,260,000
Annual Gross Profit		$ 290,000
ANNUAL SALES REVENUE		$ 2,550,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)

**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

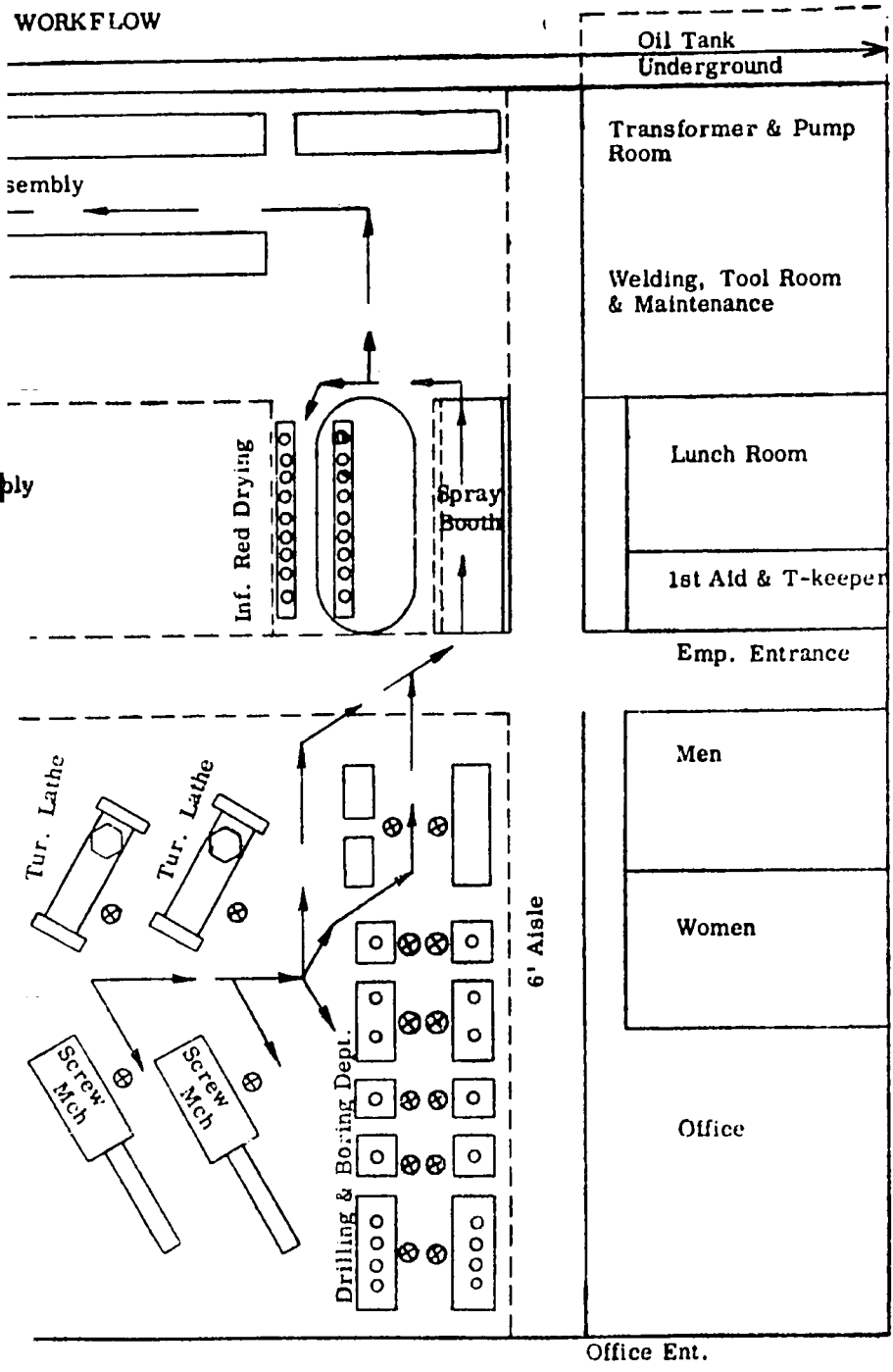
10-HORSEPOWER UT

PLANT LAYO



RIDING TRACTORS

I. P. NO. 67299
S I.C. 3522



I.P. No. 67299
S.I.C. 3522

10 HORSEPOWER UTILITY RIDING TRACTORS

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Farm Gas Engine and Tractors. Fred R. Jones. 4th Edition. 1963. $10.50

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Devoted exclusively to the subject of gas engines and tractors.

B. Tractors and Their Power Units. E. L. Barger and others. 2nd Edition. 1963. 524 pp. $14.00

John Wiley and Sons, Inc.
605 Third Avenue
New York, New York 10016

Discusses in theory and performance all major power units.

C. Farm Tractor Maintenance. Allan D. Brown and Ivan G. Morrison. 1962. Illus. $5.00

Interstate Printers and Publishers, Inc.
19-27 North Jackson Street
Danville, Illinois 61834

Devoted to the maintenance of power tractors.

II. TECHNICAL AND TRADE PERIODICALS

A. Implement and Tractor. Fortnightly. $3.00/year.

Howard W. Sams Publishing Company
1014 Wyandotte Street
Kansas City, Missouri 64105

B. Farm and Power Equipment Monthly. $2.50/year.

National Retail Farm Equipment Association Publications
2340 Hampton Avenue
St. Louis, Missouri 63139

C. Northwest Farm Equipment Journal. Monthly. $2.00/year.

Farm Implement Publishing Company
1011 Upper Midwest Building
Minneapolis, Minnesota 55401

III. BUSINESS MANAGEMENT MATERIALS

A. Profitable Small Plant Layout. John R. Immer. 48 pp. Illus. 1964. No. 21 (2nd Edition) in the Small Business Management Series of the Small Business Administration, Washington, D. C.

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

How to move materials through the shop economically and efficiently.

B. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U.S. PATENTS

Available U.S Patent Office, Washington, D.C. 20231. $.50 each.

A. Patent No. 3,283,486 November 8, 1966 6 p.
Implement supporting and lift linkage.

B. Patent No. 3,274,762 September 1966 5 p.
Mounting for mower attachment.

C. Patent No. 3,263,766 October 21, 1966 5 p.
Platform shield for tractor equipped with power take-off and pivoted hitch linkage.

D. Patent No. 3,263,406 August 2, 1966 5 p.
Front mounting for rotary type mower.

E. Patent No. 3,255,577 June 14, 1966 6 p.
Riding type power mower with floating blades.

F. Patent No. 3,245,209 April 12, 1966 7 p.
Rotary mower with means providing selecting suction for its blades.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Farm and Industrial Equipment Institute
410 South Michigan
Chicago, Illinois 60611

B. Farm Equipment Manufacturers Association
230 South Bemiston
St. Louis, Missouri 63105

C. Farm Equipment Wholesalers Association
1015 Upper Midwest Building
Minneapolis, Minnesota 55401

VI. DIRECTORIES

A. I & T Product File. No price given.

Howard W. Sams Publishing Company
1014 Wyandotte Street
Kansas City, Missouri 64105

B. Farm and Power Equipment Directory. Annual
2340 Hampton Avenue
St. Louis, Missouri 63139

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in Industrial Design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines.

They may also be reached through their national organizations, one of which is the:

National Society of Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

Address orders to: U.S. Department of Commerce
Clearinghouse for Federal Scientific and
Technical Information, 410.12
Springfield, Virginia 22151

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INDUSTRY PROFILES

POWER LAWN MOWER

I. P. No. 67300
S. I. C. 3522

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I. P. No. 67300
S. I. C. 3522
DECEMBER 1967

POWER LAWN MOWER

PRODUCT DESCRIPTION

Power lawn mower, four cyle,3 1/2 H.P., 20" swath.

A. GENERAL EVALUATION OF PROSPECTS

The fixed invesment required in this industry in moderate and only four skilled workers are required. In most countries, this product will be used mainly in the urban areas and where per capita income in urban areas is low, power lawn mowers will be considered luxury items. In countries where urban income is relatively high, the cost of this product should not be prohibitive.

B. MARKET ASPECTS

1. USERS

Private families, municipalities, business and industry.

2. SALES CHANNELS AND EXTENT OF MARKET

Sales would generally be made direct to retail stores. This product is well packaged and no special care is required in handling. Although heavy, power mowers have a fairly high value in relation to their weight. Domestic distribution should be possible on a national scale. Major competition would come from non-powered lawn mower producers which sell at a much lower price. Power lawn mowers cannot be manufactured without the use of several machine tools requiring a fixed investment of $57,000. Therefore, no domestic competition could be expected from small plants. This plant would have no difficulty competing with imported power mowers since they have the disadvantage of high freight costs and, perhaps, import duties. Normally, this plant would not have the production necessary to compete in the export market with large mass-production plants.

3. RATE OF PROFIT

It should be emphasized that the information under "Production Requirements" on the next page illustrates typical U. S. cost relationships of the various factors entering into the manufacture in the United States of a specified product. It is generally recognized that profits before taxes of manufacturers in the United States may be appreciably lower than normally would be the case in a developing country. While certain imported capital items and specialized technical services may be higher in cost in developing countries, certain other significant production costs such as semi-skilled and unskilled labor, materials and supplies obtained locally may be significantly lower. Factors vitally affecting industrial products costs and profit margins such as degree of competition, size of market, availability of labor, availability of risk capital, relative financial risk, level of industry taxes, and general economic and political stability have widely differing interrelationships and impact on the selling price and profit margin of a manufactured product in a developing country as compared with the United States. Planned operations and production limits would, of necessity, have to be adapted to cost and profit conditions existing in a particular developing country as a first step in determining whether a more intensive survey of the manufacturing possibilities for a particular product and industry is warranted.

4. SELECTED GROSS PROFIT ITEMS

(See supporting data on page 3)

The annual gross sales revenue is estimated at $275,000.
The total fixed investment, plus working capital, is estimated at $104,500.
The annual gross profit, before taxes, is estimated at $20,275.
Using these figures, the profit on gross sales, before taxes, amounts to 7.4%.
(A gross profit on sales, before taxes, of 7.4%, while reflecting U. S. experience, should not be considered normal for a developing country where profit margins may be considerably higher in industry and trade.)
The annual profit on the total capital requirements, before taxes, is estimated at about 19.4%.

5. COST PER MAN EMPLOYED

Fifteen direct workers and five indirect workers, or a total of twenty workers, are employed.
The total fixed capital investment is estimated at $57,000.
Based on these figures, the fixed investment per man employed would amount to $2,850.

C. PRODUCTION REQUIREMENTS - POWER LAWN MOWER — I.P. No. 67300
ANNUAL CAPACITY - ONE SHIFT OPERATION : 10,000 UNITS — S.I.C. 3522
NOTE : COSTS AND OPERATING DATA ARE BASED ON UNITED STATES PRICES AND PRACTICES**

1. CAPITAL REQUIREMENTS

a. Fixed Capital	Cost
Land - about 1/2 acre	
Building - one story 50' x 80' Any suitable local material.	
Equipment, furniture & fixtures	
Prodn. tools & equipment	
Other tools & equipment	
Furniture & fixtures	
Transportation equipment	
Total fixed capital	$ 57,000

Principal items:

Power Hacksaw
Lathe
Wet Grinder
Milling Machine
Metal Bandsaw
Drill Press
Bench Grinder
Tube Bender
Paint Spray Booth

b. Working Capital (30 days)	
Direct materials	
Direct labor	
Manufacturing overhead	
Administrative costs	
Sales costs	
Freight-out, discounts, bad debts & allowances	
Sales revenue	
Training costs	
Total working capital	$ 47,500
c. Total Capital Requirements	$ 104,500

2. MATERIALS AND SUPPLIES

a. Direct Materials	Annual Requirements	Annual Cost
Paint spray booth		
Aluminum casting	110,000	
Steel Cutting bar 18"x24"	10,000	
Aluminum tubing 3/4"	90,000	
Gas tank, straps, tires	10,000	
Drive shaft and cam	10,000	
Pistons & connecting rod	10,000	
Spark plug and wire	10,000	
Magnets	10,000	
Condensers & point units	10,000	
Small parts, bolts & nuts		
Packaging		
Total direct materials		$ 82,100
b. Supplies		
Lubricants & hand tools		
Cutting tools & abrasives		
Maintenance & spare parts		
Office supplies		
Gas, oil and maintenance for truck		
Total supplies		$ 2,500

c. Availability of materials & supplies

All should be available locally. All are available in world markets.

3. POWER, FUEL AND WATER

	Annual Cost
Electric Power - 24 H P. connected load	
Fuel - Heating as required	
Water - Sanitation and fire protection	$ 1,200

4. DEPRECIATION

	Yrs. life	Amount
Building	20	
Prodn. tools & equipment	10	
Other tools & equipment	10	
Furniture & fixtures	10	
Transportation equipment	4	
Total depreciation		$ 4,200

5. MANPOWER

	Number	Annual Cost
a. Indirect Labor		
Manager	1	
Supervisor	1	
Office	2	
Truck Driver	1	
Total indirect labor	5	$ 37,000
b. Direct Labor		
Skilled workers	4	
Semi-skilled workers	4	
Unskilled workers	7	
Total direct labor	15	$ 69,200

c. Training needs

The manager with the supervisor and two skilled workers should be able to train all workers and reach full production in thirty days.

6. TRANSPORTATION

a. Own transport equipment

Truck

b. External transport facilities

Good highways.

Railroad if possible.

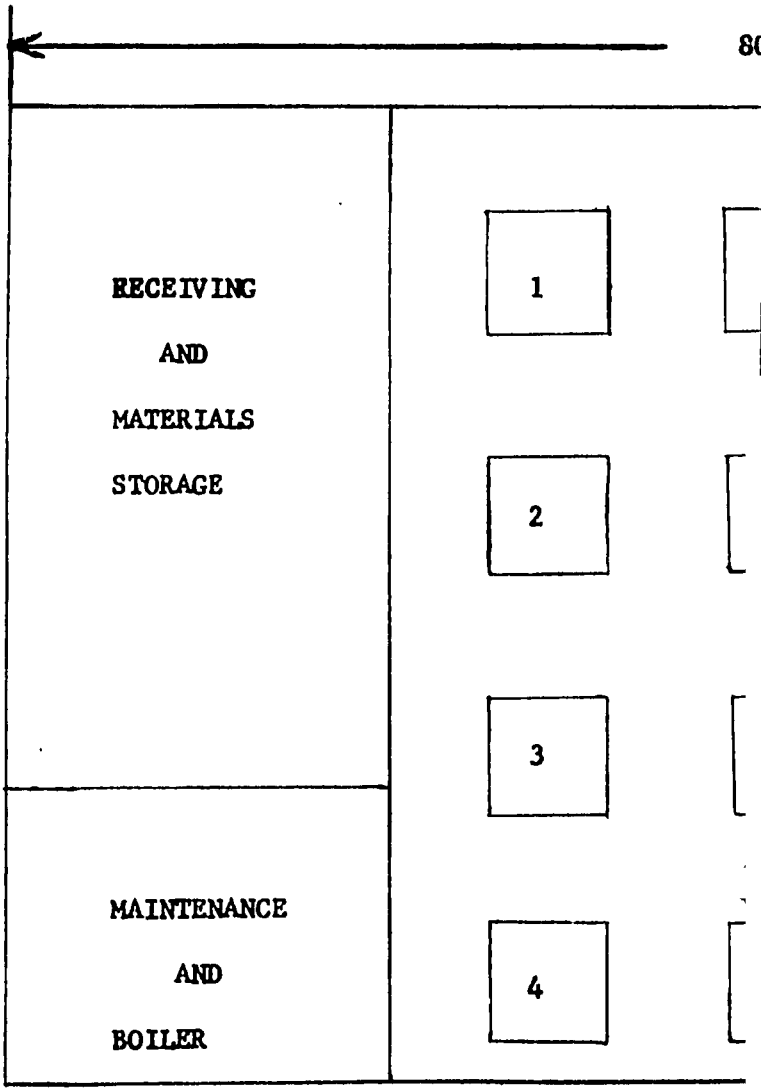
7. TOTAL ANNUAL COSTS AND SALES

REVENUE		
Direct Materials	$ 82,100	
Direct labor	69,200	
Manufacturing overhead*	44,900	
Total manufacturing cost		$ 196,200
Interest on loans		
Insurance		
Legal		
Audit		
Contingencies		
Total administrative cost		$ 18,525
Sales expense		$ 28,000
Freight-out, travel discounts Allowances & bad debts		$ 12,000
Total annual costs		$ 254,725
Annual Gross Profit		$ 20,275
ANNUAL SALES REVENUE		$ 275,000

*Includes Supplies, Power, Fuel, Water, Depreciation and Indirect labor (2b-3-4-5a)
**It was not found practical to show individual item costs because of wide variations in price and other factors, consequently only representative totals are used.

POWER

PLANT

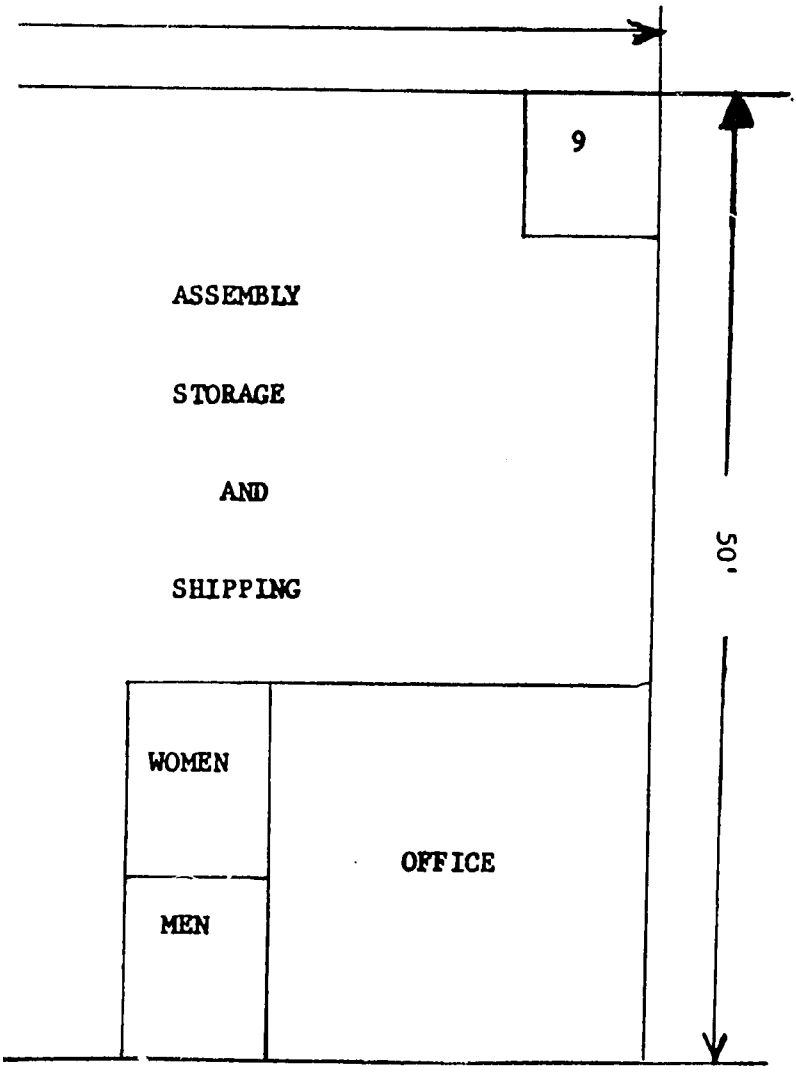


1. POWER HACKSAW
2. METAL BANDSAW
3. LATHE
4. MILLING MACHINE
9. PAINT SPRAY

I. P. NO. 67300
S. I. C. 3522

N MOWER

AYOUT



5. DRILL PRESS
6. WET GRINDER
7. TUBE BENDER
8. BENCH GRINDER

POWER LAWN MOWER

SELECTED REFERENCES

I. TECHNICAL AND TRADE BOOKS

A. Machine Tools. Herbert D. Hall and Horace E. Linsley. 448 pp. Illus. $7.50

Industrial Press
93 Worth Street
New York, New York 10013

The tools, machines, gauges, that make up our machining methods in industry.

B. Small Plant Management. W. A. MacCrehan. 1960. 60 pp. Illus. $11.00

McGraw-Hill, Inc.
330 West 42nd Street
New York, New York 10036

Guide to practical management based on a study of small plant activities.

II. TECHNICAL AND TRADE PERIODICALS

A. Journal of Applied Mechanics. Quarterly. $15.00/year

American Society of Mechanical Engineers
345 East 47th Street
New York, New York 10017

Devoted to mechanical and fabrication problems.

B. Metal Products Manufacturing. Monthly. $10.00/year

Dana Chase Publications
York Street at Park Avenue
Elmhurst, Illinois 60126

Serves the fabricated metal products industry.

III. BUSINESS MANAGEMENT MATERIALS

A. Improving Materials Handling in Small Plants. $.20

Small Business Management Series No. 4
U. S. Government Printing Office
Washington, D. C. 20402

Prepared by Small Business Administration to assist in the development of management in small business.

B. The First Two Years : Problems of Small Firm Growth and Survival. Kurt B. Mayer and Sidney Goldstein. 233 pp. $1.00

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Insights and clues concerning the entire process of small business formation, growth, and decline.

C. A Handbook of Small Business Finance. Jack Zwick. 80 pp. 1965. No. 15 in the Small Business Management Series (Seventh Edition).

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

Points out major areas of financial management and describes a few of the techniques that can help small businessmen understand past decisions and to make better decisions in the future.

IV. REPRESENTATIVE U. S. PATENTS

Available U. S. Patent Office, Washington, D. C. 20231. $.50 each.

A. Patent No. 3 256,681. June 21, 1966. 4 p.
Reversing handle mower with reversing drive.

B. Patent No. 3,242,660. March 29, 1966. 5 p.
Cutter blade and screen for lawn mower mulching attachment.

C. Patent No. 3,241,302. March 22, 1966. 10 p.
Mowing apparatus.

D. Patent No. 3,226,037. February 22, 1966 5 p.
Power lawn mower attachment.

E. Patent No. 3,233,471. February 8, 1966 4 p.
Power take-off connection.

F. Patent No. 3,230,695. January 25,1966. 14 p.
Safety controls for an elecrical powered lawn mower.

G. Patent No. 3,225,527. December 28, 1965. 4 p.
Power rotary lawn mower, blade and sharpener.

V. TECHNICAL INSTITUTES AND TRADE ASSOCIATIONS

A. Outdoor Power Equipment Institute
734 - 15th Street, N. W.
Washington, D. C. 20005

Members are manufacturers of lawn mowers, garden tractors, snow throwers, etc.

VI. DIRECTORIES

A. Standard Metal Directory. $15.00

American Metal Market Company
525 West 42nd Street
New York, New York 10036

Thorough listing of United States producers of metal products, equipment used, and products made.

VII. PROFESSIONAL ENGINEERING SERVICES

The services of professional engineers are desirable in the design of industrial plants even though the proposed plant may be small.

A correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

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2029 K Street, N. W.
Washington, D. C. 20006

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project. The equipment manufacturer also knows, and can recommend, professional engineers in private practice who are willing and able to provide appropriate consulting services.

PRE-INVESTMENT FEASIBILITY STUDY SUGGESTED

The foregoing information must be necessarily presented in concise form. Before an investment is made in a plant a feasibility study is suggested. The investor, for his planning, should have more information dealing with the specific locality contemplated. For obvious reasons, such information cannot be included in *Industry Profiles*. Such a study, therefore, should explore local factors and conditions, including costs, sources of raw materials and supplies, availability of utilities and fuel, manpower, transportation, etc.

The investor will need reasonably accurate information on Government and legal requirements, banking and financing, potential demand, competition, construction services, and manpower training requirements. Further, he should consider developing plans for management and production controls, operating procedures, and sales promotion.

ORDERING INSTRUCTIONS

The price of *Industry Profiles* is a minimum of $3.00 for from one to five "*Profiles*." The purchaser may select up to five of any "*Profiles*" available.

Complete sets of the 250 *Industry Profiles* published in 1966, I. P. No. 66001 through I. P. No. 66250 consecutively, may be purchased for $125.00 per set. Complete sets of the 150 *Industry Profiles* to be published in 1967, I. P. No. 67251 through I. P. No. 67400 consecutively, may be purchased for $75.00 per set. The latter "*Profiles*" will automatically be shipped to full set purchasers upon release.

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Prepayment is required. Make check or money order payable to National Bureau of Standards—CFSTI. Clearinghouse deposit account holders may charge purchases to their accounts.

GENERAL INFORMATION

An *Index of Industry Profiles* is available on request from the agency for International Development, AA/PRR, Washington, D. C. 20523.

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