

The Afghanistan Engineering Support Program assembled this deliverable. It is an approved, official USAID document. Budget information contained herein is for illustrative purposes. All policy, personal, financial, and procurement sensitive information has been removed. Additional information on the report can be obtained from Firouz Rooyani, Tetra Tech Sr. VP International Operations, (703) 387-2151.

To: [REDACTED] COR
[REDACTED] ACOR
[REDACTED], OEGI Vertical Structures
[REDACTED] OEGI

From: [REDACTED] - Structural Engineer
[REDACTED] - DCOP

Date: March 14, 2012

Re: WO-A-0084 Sardar Girls High School Fire Door Suppliers and Cost Estimates

EXECUTIVE SUMMARY

The Sardar Girls High School (SGHS) construction is a project in Kabul, Afghanistan administered by the USAID – Office of Economic Growth and Infrastructure (OEGI) Vertical Structures group.

Building design and specifications for this project were prepared by UNOPS. Tetra Tech (TT) is in receipt of two documents from UNOPS that comprise the specification package (1) Project Specifications dated January 18, 2010 and (2) Project Schedules Revision 2 dated January 18, 2010.

According to the request by USAID as outlined in the scope of work dated January 15, 2012, TT was requested to research manufacturers and/or suppliers of fire rated doors and provide a summary report listing qualified suppliers and contact information along with estimated budget pricing and delivery schedule information.

Responses received from each prospective supplier varied in some way from the initial request, according to specific limitations of each supplier. Five regional (India and United Arab Emirates) suppliers of NFPA 80/UL rated fire doors were contacted. Follow-up messages and phone calls resulted in four responses being received. Two of the four responses included a cost quote for UL labeled doors built to the original or a revised design (one of these included an estimate of shipping costs from India to Kabul). One of the four responses included a cost quote for doors/door assemblies built to the original design (including the glass panels) but with no UL label (Certification from the manufacturer stating manufacture conforms to UL standards would be included). The fourth response provided technical information, but repeated follow-up did not result in a cost offer. Cost estimates ranged from approximately [REDACTED] for redesigned doors without shipping included, and approximately [REDACTED] for door assemblies per the original design with UL Label and shipping to Kabul.

USAID has alternatives to consider in selecting the supplier of the replacement SGHS fire door/door assemblies as summarized in the following table:

| Supplier Name | Can Match Original Design? | Can Supply UL Labeled Door? | Country of Origin | Time from Approved P.O. to Shipment | Price Includes Shipping? | Quoted Cost (includes 30 double doors and hardware) |
|---------------|------------------------------|--|-------------------|-------------------------------------|--------------------------|---|
| [REDACTED] | No.* Offered redesigned door | Yes. UL Labeled NFPA 80 compliant | India | 4 Weeks | No | [REDACTED] |
| [REDACTED] | Yes. | No. Will provide certificate that doors manufactured complying with UL standards | India | 2 Weeks | No | [REDACTED] |
| [REDACTED] | Yes. | Yes. UL Labeled NFPA 80 Compliant | India | 8-9 Weeks | Yes | [REDACTED] |
| [REDACTED] | Yes. | No. India Standard | India | 6-8 Weeks | Cost Not Provided | Cost Not Provided |

* Proposed reconfiguration is included in Appendix A.

REQUIREMENTS - ORIGINAL SPECIFICATIONS

Fire doors are addressed in UNOPS Project Schedules: Section 4.4 - Steel Door Schedule and 4.5- Annealed Glasses Schedule. Fire doors are referred to in this document as “D4” and “D5”. Specific requirements of fire rated doors are listed in Section 4.4 – Steel Door Schedule and include:

- Doors are to be “entirely fire resistant” and comply with National Fire Protection Code NFPA 80;

- Steel panels are to be 1.5 mm sheet thickness. *Note*, ≥ 1.4 mm thickness is listed as a requirement in the Project Specifications;
- Ball bearing hinges;
- Rubber seals;
- Clear float, break-proof glass.

Sardar Girls High School construction drawings prepared by UNOPS show a total quantity of Sixty (60) steel fire doors. Fifty-four (54) steel fire doors (27 double door openings) measuring 850 mm wide by 2050 mm high each and Six (6) steel fire doors (3 double door openings) measuring 800 mm wide by 2050 mm height each. See table below.

| Door Type (Refer to drawing) | Double Doors | | Size of opening (Doors including side lights) | | Quantity of Double Door Locations | | | |
|---------------------------------|--------------|--------|--|--------|-----------------------------------|-------------|--------------|-----------|
| | Width | Height | Width | Height | Ground Floor | First Floor | Second Floor | Totals |
| 4 | 1700 | 2050 | 2700 | 2750 | 7 | 6 | 5 | 18 |
| 4a | 1700 | 2050 | 2425 | 2750 | 1 | 1 | 0 | 2 |
| 4b | 1700 | 2050 | 2575 | 2750 | 3 | 1 | 2 | 6 |
| 5 | 1600 | 2050 | 2525 | 2500 | 1 | 0 | 0 | 1 |
| 5a | 1600 | 2050 | 2235 | 2750 | 2 | 0 | 0 | 2 |
| 5b | 1700 | 2050 | 3750 | 2750 | 1 | 0 | 0 | 1 |
| Sub Totals | | | | | | | | 30 |

PROJECT SPECIFICATION COMMENTS

NFPA 80 Section 4.1.1 Classification states that fire doors shall be classified by designating a required fire protection rating expressed in hours or fractions thereof. The actual project specification from the UNOPS architect makes no mention of such rating. After a response to USAID's query from the UNOPS (ex) architect, Engineer Abdul Salam Mukhtar, regarding calculated fire ratings, Tetra Tech and USAID have concluded that the doors for Sardar are to be 45 minute fire rated by design.

A slight discrepancy in the listed thickness of the fire door base metal panels exists between the specification document and the schedules document (1.4 mm vs. 1.5 mm) as noted above.

SUMMARY

Tetra Tech has contacted five manufacturers, for the proposed replacement fire doors. Four companies responded and provided the following information (there was no response from one manufacturer):

1. Manufacture: **Shakti Met-dor**

Country: India

Website: www.shaktimetdor.com

Contact: [REDACTED]

Email: [REDACTED]

Phone: [REDACTED]

Specifications: UL labeled and NFPA 80 compliant

Fire Door Details:

According to the discussion with this manufacturer, they can't provide doors according to our drawings because they said *"We can make the doors as per NFPA 80 and labeled. However, if you observe the door elevations given are not in line with the maximum glass allowed on doors, which are 1296sq. inches per vision light (45 minutes). You also have side lights on the elevations. So having so much of glass around we may not be able to put the label, but definitely manufacture the door to meet your requirement"*

Shakti Met-dor Cost Estimate and other information are attached in **Appendix A**.

2. Manufacture: **Indigatech**

Country: India

Website: www.indigatech.com

Contact: [REDACTED]

Email: [REDACTED]

Phone: [REDACTED]

Specifications: NFPA 80, ANSI/UL 10 B (ninth edition, 2001), CAN4-S2104-M80

Fire Door Details:

According to discussions with this manufacturer, they can manufacture fire rated doors according to our drawings and specifications and they said *"As per UL certification we have been authorized to give certificate only for Standard door size of (1100 x 2100-SD & 2100 x 2100 DD). As your door sizes are beyond the standard*

size, UL certificate cannot be provided. However the manufacturing process involved is complying with the UL standards and Indigatech certificate can be provided"
Indigatech detailed offer and all information are attached in **Appendix B**.

3. Manufacture: **Agew Steel**

Country: India

Website: www.agewsteel.com

Contact: [REDACTED]

Email: [REDACTED]

Phone: [REDACTED]

Specifications: UL labeled and NFPA 80

Fire Door Details:

According to discussions with this manufacturer, they can manufacture fire rated doors according to our drawings and specifications and UL certificate can be provided.

Agew Steel detailed offer and all information are attached in **Appendix C**.

4. Manufacture: **Megha Communication (CCTV)**

Country: India

Website: www.cctv-india.com

Contact: [REDACTED]

Email: [REDACTED]

Phone: [REDACTED]

Specifications: BS476 Part 20 & 22, ISO 834, ISO 3008, IS3809/IS 3614 Part-II-1992

Fire Door Details:

According to discussions with this manufacturer, they can provide fire rated doors but they couldn't send their offer now.

Megha Communication specification and all information are attached in Appendix D.

5. Manufacture: Vulcan Industries LLC

Country: UAE

Website: www.vulcanuae.com

Contact: [REDACTED]

Specifications: BS 2989, BS 1245

Fire Door Details:

Email and inquiry is sent to this manufacturer but no response has been received. See **Appendix E** for more information.

CONCLUSION

- The contact from Shakti Met-Dor has been very responsive and informative. Shakti Met-Dor appears to be knowledgeable of the standard specifications for fire rated steel doors. They are capable of providing fire doors with UL Labels and conforming to NFPA 80.
- Agew Steel appears able to provide doors/door assemblies according to our design and specification with UL labels conforming to NFPA 80.

Appendices

Appendix A – Shakti Met-dor

[REDACTED]

From: [REDACTED]
Sent: Tuesday, February 14, 2012 3:13 PM
To: [REDACTED]
Subject: FW: Fire Door Request for Price and Availability

From: [REDACTED]
Sent: Thursday, February 02, 2012 8:34 AM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: Fire Door Request for Price and Availability

Dear [REDACTED]

The doors with a fire rating of 45 minutes as per NFPA and UL will be acceptable. We agree that this is the best possible solution and look forward to receiving your quote for the doors.

From: [REDACTED]
Sent: Wednesday, February 01, 2012 3:57 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: Re: Fire Door Request for Price and Availability

[REDACTED]

Please find attached the best possible solution for the Labeled door as requested. Please confirm if this is acceptable to you. This door will be rated for 45minutes as per NFPA and UL test certificate as teh glass size used is around 1296sq.inches.

We will send you the offer on receipt of your confirmation.

reg
[REDACTED]

----- Original Message -----

From: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Sent: Saturday, January 28, 2012 4:57 PM
Subject: RE: Fire Door Request for Price and Availability

Dear [REDACTED],

Thank you for your informative response. The doors and door assemblies shown on the drawings may be modified to conform to NFPA 80. Could you provide a cost for door and door assemblies using the given opening dimensions? Please let me know if you require any additional information.

Thank you,

From: [REDACTED]
Sent: Saturday, January 28, 2012 10:13 AM
To: [REDACTED]
Cc: [REDACTED]
Subject: Re: Fire Door Request for Price and Availability

Dear [REDACTED]

Greetings!, We have reviewed your request and found the following observations for your understanding. In addition we have given our comments against each point raised by you.

reg
[REDACTED]

----- Original Message -----

From: [REDACTED]
To: [REDACTED]
Sent: Wednesday, January 25, 2012 2:49 PM
Subject: Fire Door Request for Price and Availability

Dear [REDACTED],

I work for an international engineering contractor in Kabul, Afghanistan working for USAID. We are looking into replacing Fire Doors in a recently completed building. We would like to request the following information regarding your Fire Rated Steel Doors.

Do you ship to Kabul, Afghanistan?

We have not shipped any material to Kabul, as we dont have access to this market. However, we would like to inform you that these markets are served by agencies on turnkey basis. We have no issues in supplying teh material and installing it if required.

If so, how long does it take for a shipment to arrive from the time of the placed order?

We process orders once the PO is technically and commercially cleared in all aspects. On an average we take 4weeks to manufacture and for afganistan, we dont have any knowledge of shipping time and the route through teh material has to be shipped.

Are your Fire Steel Doors conforming to NFPA 80 and are they labeled?

Yes we have doors under UL lable certification programe and teh doors manufactured are labled and comply with NFPA 80 in all aspects.

Are your Fire Steel Doors UL labeled?

Test certificates are atatched for yoru kind perusal.

Do your Fire Steel Doors conform to the attached specifications for Steel Doors?

We can make the doors as per NFPA 80 and labled. However, if you observe the door elevations given are not in line with the maximum glass allowed on doors, which is 1296sq. inches per vision lite (45 minutes) . You also have side lights on the elevations. So having so much of glass around we may not be able to put the lable, but definetly manufacture teh door to meet your requirement.

What would the estimated cost be for each of the types of doors shown on the attached drawings?

Approximate double door opening of 1600 to 1700 mm wide by 2050 mm high.

Note: Actual dimensions will be verified at time of placed order.

Actually the size requirement is 2425 x 2750 and not 1600 x 2050. It is how we interpret the requirement as teh side lights also needs tobe covered under the certification. Secondly, these sidelights may have to be welded and finished in the factory before it is shipped.

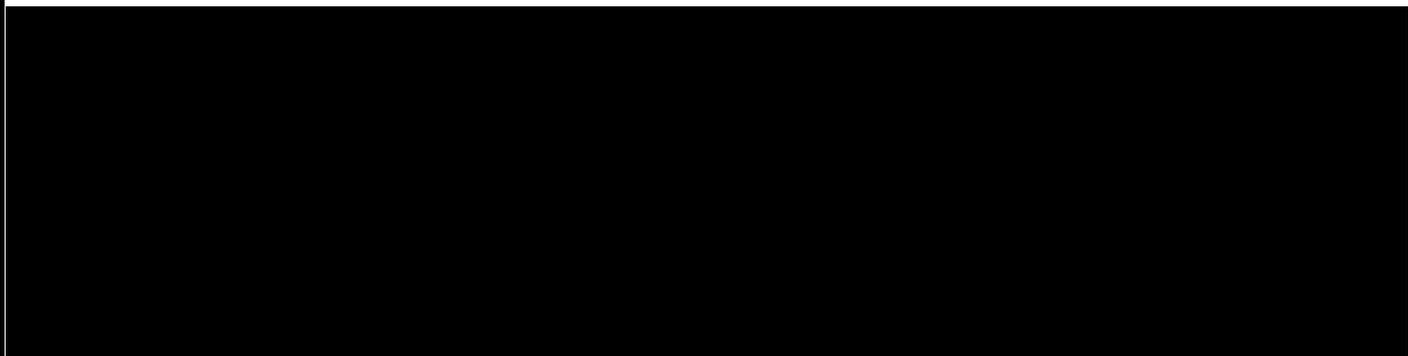
We have supplied similar doors to Jeddah (umm al Qura University). We request you to kindly confirm if the label is mandatory which means we may have to change the drawings. Please give your inputs and then we can give an indication about the pricing. In its current state we will not be able to price it as a labled door. Thanks for your understanding

reg



Please feel free to contact me with any questions.

Thank you,



Email secured by Anti Spam at CtrlS

SHAKTI MET-DOR LIMITED
TERMS AND CONDITIONS
FOR SUPPLY OF DOORS & HARDWARE

1. Despatch of Material: Minimum 4 weeks time for Galvanized Steel Doors & 6 - 8 weeks time for Stainless Steel Doors from the date of receipt of Technically & Commercially clear purchase order.

An order will be considered technically clear only on receipt of the following information:

- a) Handing Policy (direction of doors opening - floor plans)
- b) Colour Shade approval
- c) Hardware samples (if procured by you)
- d) Samples of accessories to be fixed by other agencies such as electronic access control devices etc. with locational drawings

The order is commercially clear on receipt of the following information:

- a) Our acceptance and confirmation of all terms of the purchase order.
- b) Receipt of advance by way of demand draft payable at Hyderabad.

2. Payment (Doors & Hardware) : 100% advance THROUGH bank by way of Telegraphic Transfer.
3. Transportation : Your Scope
4. Warranty: "SHAKTI MET-DOR LIMITED warrants its products to be free from defects in workmanship or materials, while subjected to normal usage for a period of 12 months from the date of supply. SHAKTI MET-DOR LIMITED will replace defective parts and/or products free of charge provided, the products were used as intended, and were maintained properly. This warranty is given in lieu of all other warranties, expressed or implied, and the manufacturer makes no implied warranty or merchant ability beyond the express terms hereof. Manufacturer's liability for damages, including consequential damages, resulting from any defective product, is strictly limited to the delivery of new parts, as set for above".
5. Validity : 30 days from the date of quotation for quantities quoted. Fresh quotation shall be submitted for any variation in the quantities.

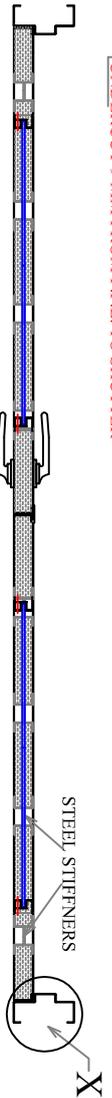
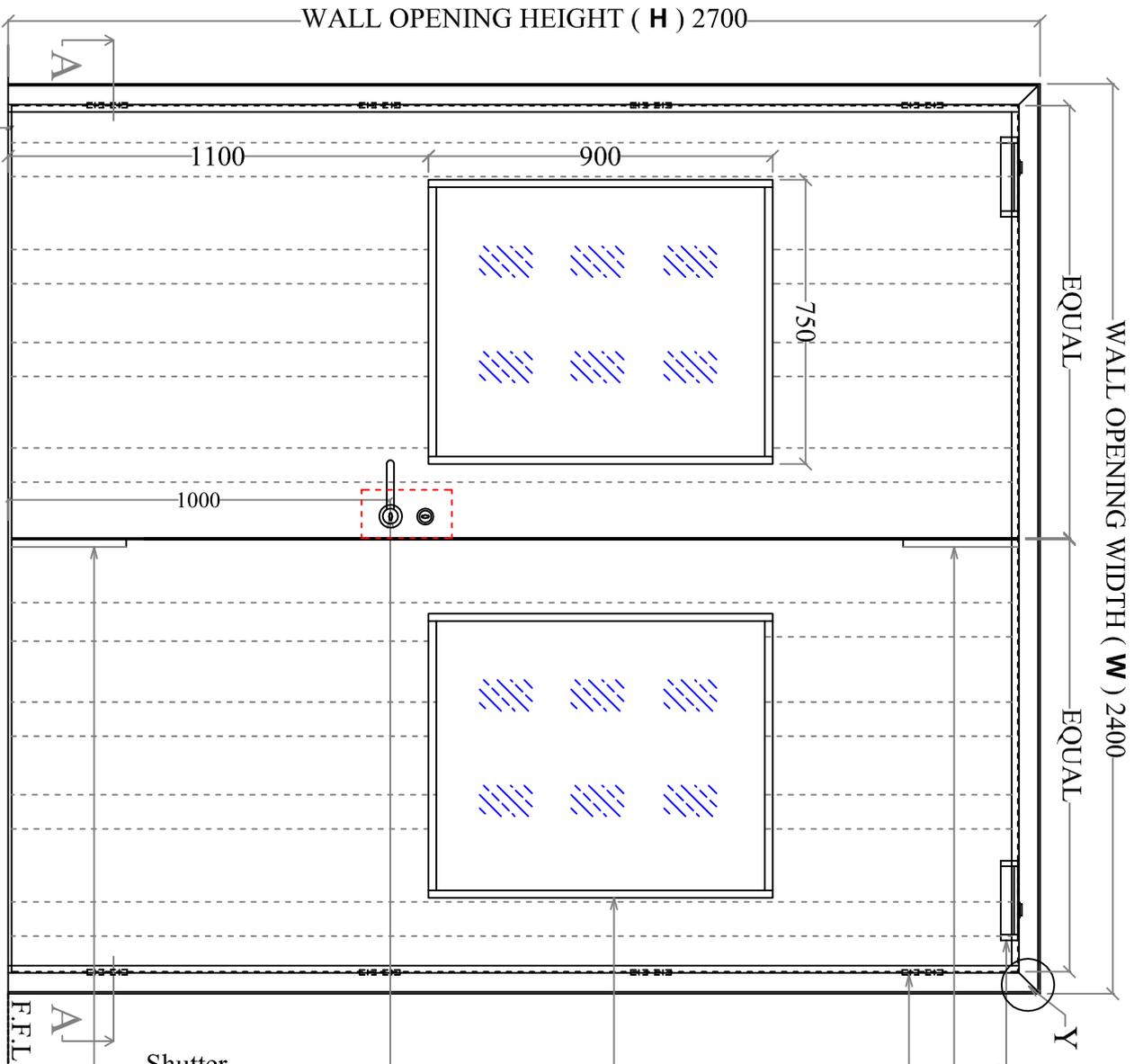
Shakti Met-Dor Limited

Quotation For : M/s. Tetrattech, Afghanistan
Project: Self

| ALL THE PRICES QUOTED ARE IN US DOLLAR | |
|--|-----------------------|
| U L LABLED FIRE DOORS WITH 45 MINUTES FIRE RATING | |
| S.No. | |
| Wall Opening (W) - mm | 2400 |
| Wall Opening (H) - mm | 2700 |
| Finish | PAINT |
| Door Type | FIRE |
| Fire rating | 45 minutes |
| | Double shutter |
| Equal / Unequal | Equal |
| Frame & shutter Profile | 1.6 x 1.2 mm |
| Basic Price (A) | 655.04 |
| Hardware | Qty |
| 5 Knl, Ball bearing hinges size 4.5"x4"x3.4mm, US32D - Lawrence make | 8 |
| Mortice Grade 1 lock -Classroom - LH8705-L01-US32D - Lawrence | 1 |
| Heavy Duty Door Closer Grade-1 825 Size 2-5 with Std. arm. - Lawrence | 2 |
| Door Coordinator Drop Down Stile - Lawrence | 1 |
| Galary Auto Flush Bolt | 2 |
| Schott Fire Rated Clear Glass W 750mm x H 900mm - Single glazed | 2 |
| Self Adhesive Side Roll (Ceramic Tape) Kerfai2000 Length-10mtrs/Roll. Product Code No.:400000 - for fixing abvoe vision glass | 13.2 |
| Total Cost of Hardware (B) | |
| Total for Door with hardware (A+B) | |
| Qty. | |
| Grand Total for Doors with Hardware for the entire Quantity | |

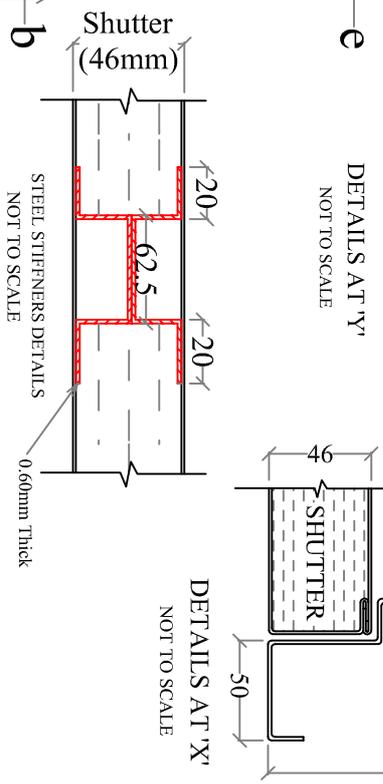
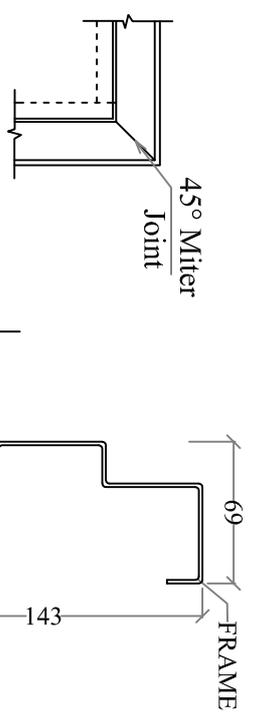
| SUMMARY | |
|------------------------------|--|
| Total No. of Doors | |
| Total for the entire qty. | |
| Exportworthy packing charges | |
| TRANSPORTATION | |
| Grand Total (in USD) | |

Note : Installation Tetra Scope



SECTION AT 'A-A'

- Door Qty : 30 Nos.
- HARDWARE:**
- (a) 2 Nos. Heavy Duty Door Closer Grade-1 825 size 2-5 with Standard Arm-Lawrence.
 - 1 No. Door Coordinator Drop Down Slite-Lawrence.
 - (b) 2 Nos. Gallery Auto Flush Bolt.
 - (c) 8 Nos. 5 knl Ball Bearing Butt Hinges size 4.5"x4"x3.4mm US32D-Lawrence Make.
 - (d) 2 Nos. Schott Clear Fire Rated Vision (Single Glazed).
 - (e) 1 No. Mortice Grade 1 Lock-Classroom-LH-8705-L01-US32D - Lawrence.
- Infill : Steel Stiffeners with Mineral Wool
- Shutter thickness : 46mm
- Sheet thickness :-
- Frames : 1.60mm Shutter : 1.20mm
- NOTE:- All Dimensions are in mm.**



PROJECT: M/s. TETRATECH, AFGHANISTAN,

TITLE : 45 Mins. FIRE RATED UL LABELLED DOORS.

Shakti Met-dor

DRAWN BY : S.D.G
 CHECKED BY : T.R.B
 APPROVED BY : K.V/R

SCALE :- 1:1

D R G. N.O.
 SML/MKT/PAA/2020

DATE : 07-02-2012

REV
 3

THIS DRAWING AND THE DESIGN IT COVERS ARE THE PROPERTY OF SHAKTI MET-DOR LTD. THEY ARE MERELY LOANED AND ON THE CONDITION THAT THEY WILL NEITHER BE REPRODUCED, COPIED, LOANED, EXHIBITED NOR USED EXCEPT IN A LIMITED WAY FOR PRIVATE USE PERMITTED BY THE WRITTEN CONSENT OF SHAKTI MET-DOR LTD.



About us:

We are one of India's pioneers in steel door manufacturing and have established a strong pan india presence with 7 branches in all major cities. Our operations started in the year 1994 in collaboration with M/s Martin Roberts, U.K. We have since 1999 independently continued our research & development efforts to design and supply a range of steel doors for various applications. We have grown from a single product company (steel doors) to a multi-product company catering to the global construction industry.

Shakti Met-Dor products have a wide range of applications in

- High Rise Buildings
- Commercial and Industrial Units
- Hotels & Service Apartments
- Software Parks
- Power Plants
- Petrochemical Plants
- Telecom Industry
- Airports
- Studios & Auditoria
- Corporate Offices
- Defense establishments
- Pharmaceutical
- Schools and Universities

Our products are manufactured in a state-of-the-art manufacturing facility in Hyderabad, A.P., India with a built up area of more than 4,50,000 Sq.ft. The facility is ISO 9001-2000 certified and is equipped with advanced high-tech computerized and numerically controlled machines with an installed capacity of 300,000 doors per annum.

Our Product Range :



Shakti Met-dor - Hollow Metal Doors



Imperia - Casement Steel Windows



Nova - Toilet partitions and cubicles, Urinal partitions

For any additional information you can also visit our new website www.shaktimetdor.com



Shakti Met-Dor Limited

Plot No 20, Sripuri Colony,

Karkhana, Secunderabad.

A.P. India – 500 015

Phone: (91) 40 – 2784 0394 Fax: (91) 40 - 2789

2327

e-mail: marketing@shaktimetdor.com

1. Hollow Metal Doors

We manufacture a comprehensive range of Hollow metal doors for various applications and to national and international standards. These find acceptance both in the international and domestic market.

When it comes to safety and fire we offer the most stringent classification of NFPA as our Doors are tested and listed by Underwriters Laboratory (UL), USA. In India our products surpasses the requirement of both BS and IS standard for stability and integrity and are tested at CBRI and ARAI. The range includes the following :

Fire Doors

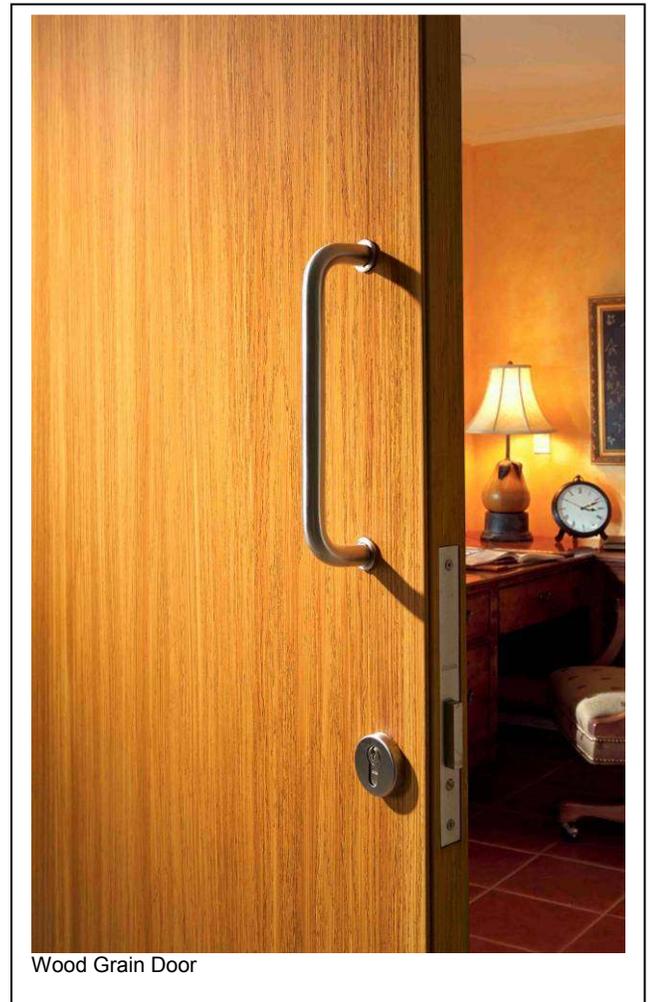
Scientific Doors

General Doors

Rail and Stile Doors

Wood Grain Doors

Special Doors



2. Casement Windows - Windows Imperia

Steel Windows are inherently more durable than almost any alternative material used in construction, their life cycle is unsurpassed, by direct comparison, they are three times stronger than aluminum. This advantage permits the use of immense glass lights, often in spectacular openings.

We offer windows with security grill and mosquito mesh as an option. Windows are available in various RAL shades.



3. Toilet Cubicles - NOVA toilet partitions & cubicles

We also offer wide range of Toilet Partitions of international quality which are available in three different variants. Produced from the highest quality of galvanized steel and stainless (304Grade) steel, these cubicles are a perfect solution for privacy and ease in maintenance.

In addition we also have a choice of Urinal Partitions for privacy in both galvanized steel and stainless steel.



SERVICES:

We offer a wide range of services to the Architectural community and Construction industry. We have developed the expertise and knowledge in Door and Hardware scheduling over the past 15 years. This expertise has assisted and delivered optimum, cost effective solutions to the industry. "The right product for the right application" has ensured trouble free solutions to customers for over 15 years.

We make every effort in maintaining the highest quality of products and have successfully built an impressive clientele over the years. "We have been an intimate part of your everyday, in your own personal space; all the while keeping you secure, yet staying almost invisible."

Should you require any additional information about the company or the products please feel free to contact us.

Best Regards

Syed Mohamed
Head-Marketing

Certificate of Compliance

Certificate Number 20090415-R26117
Report Reference 2009 April 16
Issue Date 2009 April 16

Page 1 of 2



**Underwriters
Laboratories Inc.**

Issued to: **Shakti Met-Dor**

Plot 20, Sripuri Colony
Karkhana
Secunderabad AP 500015 India

*This is to certify that
representative samples of*

Fire Door and Window Frames

Have been investigated by Underwriters Laboratories Inc.® (UL) or any authorized licensee of UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:

UL 10B - Fire Tests of Door assemblies, UL 10C-(1998) - Standard for Positive Pressure Tests of Door Assemblies, UBC 7-2 (1997) Part I - Fire Tests of Door Assemblies, NFPA 252 - Fire Tests of Door Assemblies

Additional Information: See addendum for product listings

Only those products bearing the UL Classification Mark should be considered as being covered by UL's Classification and Follow-Up Service.

The UL Classification Mark includes: UL in a circle symbol:  with the word "CLASSIFIED" (as shown); a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and, the product category name (product identity) as indicated in the appropriate UL Directory.

Look for the UL Classification Mark on the product

Issued by:


Mona Couloute

Underwriters Laboratories Inc.

Reviewed by:


Matthew Schumann

Underwriters Laboratories Inc.

Certificate of Compliance

Certificate Number **20090415-R26117**
Report Reference **2009 April 16**
Issue Date **2009 April 16**

Page 2 of 2



This is to verify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

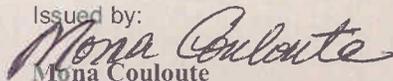
Door Frames for use as a component in fire door assemblies that meet the requirements of UL10C, UBC 7-2 (1997) Part I (positive pressure) and UBC 7-2 (1997) Part II (air leakage/ smoke, "S"):

Three sided steel frame with or without transoms, single swing and pairs, of welded or knockdown construction. These frames are also suitable for use in smoke door applications when used with Classified Swinging Type Fire Doors, Positive Pressure Tested (GSZN) bearing the "S" mark on the Classification Marking and Category H Smoke and Draft Control Gasketing. See Gasketing Materials for Fire Doors, Positive Pressure Tested (GVYI) for listings of Category H smoke and draft control gaskets.

Door Frames for use as a component in fire door assemblies that meet the requirements of UL10B (neutral pressure):

Three-sided frames with transom bars, single swing and pairs featuring welded construction.

Issued by:


Mona Couloute

Underwriters Laboratories Inc.

Reviewed by:


Matthew Schumann

Underwriters Laboratories Inc.

Certificate of Compliance

Certificate Number **20090416-R26118**
Report Reference **2009 April 16**
Issue Date **2009 April 16**

Page 1 of 2



**Underwriters
Laboratories Inc.**

Issued to: **Shakti Met-Dor**

Plot 20, Sripuri Colony
Karkhana
Secunderabad AP 500015 India

*This is to certify that
representative samples of*

Swinging-type Fire Doors

Have been investigated by Underwriters Laboratories Inc.® (UL) or any authorized licensee of UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:

UL 10B - Fire Tests of Door assemblies
NFPA 252 - Fire Tests of Door Assemblies

Additional Information:

4'0" X 10'0" single doors
8'0" X 10'0" pair of doors

Only those products bearing the UL Classification Mark should be considered as being covered by UL's Classification and Follow-Up Service.

The UL Classification Mark includes: UL in a circle symbol:  with the word "CLASSIFIED" (as shown); a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and, the product category name (product identity) as indicated in the appropriate UL Directory.

Look for the UL Classification Mark on the product

Issued by:


Mona Couloute

Underwriters Laboratories Inc.

Reviewed by:

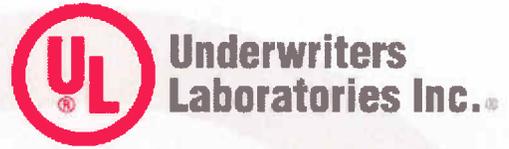

Matthew Schumann

Underwriters Laboratories Inc.

Certificate of Compliance

Certificate Number **20090416-R26118**
Report Reference **2009 April 16**
Issue Date **2009 April 16**

Page 2 of 2



This is to verify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

| Max Rating | Opening Type | Hollow Metal Type Door | Steel Covered Composite Type Door |
|------------|---|------------------------|-----------------------------------|
| 3 Hr | Single or Pair With Astragal | X | — |
| 1-1/2 Hr | Single Point Lock/Flush Bolts Single With | X | X |
| 3 Hr | Single Point Lock/Flush Bolts Single or Pair With Astragal | X | — |
| 1-1/2 Hr | Rim, Mortise/Vertical Rod Single With | X | — |
| 1-1/2 Hr | Rim, Mortise/Vertical Rod Pair Without Astragal | X | — |
| 1-1/2 Hr | Vertical Rod/Vertical Rod Door With Automatic Louver | X | — |
| 3 Hr | 250 F Temp Rise Door | X | — |
| 3 Hr | 450 F Temp Rise Door | X | — |

Issued by:

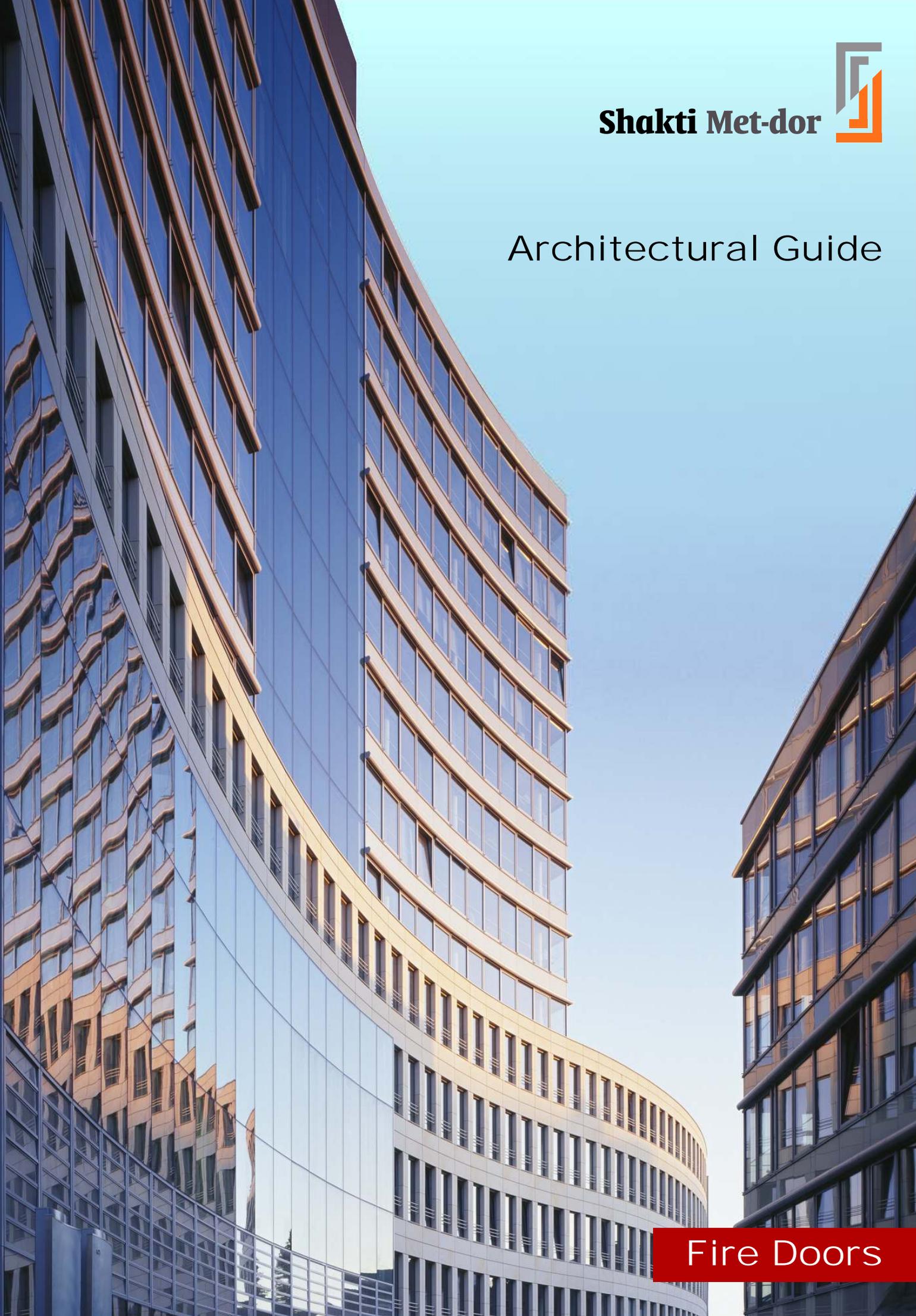
Mona Couloute
Mona Couloute

Underwriters Laboratories Inc.

Reviewed by:

Matthew Schumann
Matthew Schumann

Underwriters Laboratories Inc.



Shakti Met-dor



Architectural Guide

Fire Doors

INDEX

About us

Overview

- Hollow metal door selection guide
- Fire rating indicative chart
- Indicative chart for selection and application of doors
- Guide for selection of swinging fire doors and frames.

Product: Fire doors

- Introduction to fire doors
- Features
- Door frames data, features, hardware preparation, frame assembly, anchoring and fixing details.
- Door leaf data, features, door leaf construction, UL labelled doors, data sheet for labelled doors, data sheet for IS and BS doors.
- Finishes
- Handing of doors
- Specification for UL labelled doors
- Specification for IS and BS doors.





lot happens at our doors. Welcomes, handshakes, smiles, friendships, management

decisions...we have seen it all. We have been an intimate part of your everyday, in your very own personal space; all the while keeping you secure, yet staying almost invisible.

We are Shakti Met-Dor, India's finest custom steel doors and frames manufacturer. Our strength in production, quality, innovation, technological competence and distribution have allowed us to penetrate the entire country as well as take us beyond India's boundaries. You will find us in numerous installations across Cyprus, Dominican Republic, Kenya, Saudi, Oman, Vietnam and Sri Lanka amongst others.

Since 1994, Shakti Met-Dor has grown from a single product company (i.e., Steel Doors) into a multi-product company catering to the global construction industry. The company's constant endeavour to improve quality and innovation has ensured market leadership since its inception.

The company's sprawling 45,000 sq. m. facility which includes manufacturing, warehousing and testing facilities is situated at Gagillapuram Village on the outskirts of Hyderabad, Andhra Pradesh, the 5th largest city in the country. The facility is ISO 9001-2000 certified and equipped with advanced, high-tech computerised numerically controlled manufacturing equipment with state-of-the-art painting lines with an installed capacity of 300,000 door sets.

Today Shakti manufactures the most complete line of distinctive steel doors and frames catering to the commercial construction market requirements. In addition, the company's range of products include Steel Casement Windows, Toilet Partitions, Fire Rated Partitions, Sectional Doors and High Speed Roll Up Doors, offering the commercial market a range of precision engineering products of international quality at competitive prices.

Shakti's personnel interact directly with architects, consultants, specifiers and clients to understand their specific requirements and meet their needs in the most effective and prompt manner with sales and marketing offices located in all major cities across India. Shakti's service spectrum goes beyond assisting clients in project scheduling and also facilitates delivery and installation of products through an extensive network of trained contractors.

Shakti the industry standard for quality, innovation and service.

OVERVIEW 

HOLLOW METAL SWINGING FIRE DOOR SELECTION GUIDE

At Shakti Met-dor, we are equipped to offer Fire Doors tested and certified to American and Indian / British Standards. The significant requirements of each of these standards are listed below.

1. AMERICAN

NFPA 80-1999, NFPA 252-1995, UL 10B,
UL 10C, UBC 7-2 and IBC 2000.

- A fire door must have a label attached indicating the fire test rating.
- Doors are rated for 3/4th of the rating of the surrounding wall.
- Every fire door must have a labeled self-latching device to engage the strike. Dead bolts may not be used in place of latch bolts.
- A fire door MUST be self-closing.
- Steel ball bearing hinges must be used. Brass, bronze or other bases cannot be used. Plain bearing hinges cannot be used as well.
- If a fire door is held open, it must be equipped with a listed / tested, heat responsive or electromagnetic device, fusible link or a smoke detection device.
- Only listed / tested fire door hardware shall be used.
- A fire door with glass opening must be provided with a listed / tested glass, a steel frame and glazing bead.
- Every assembly configuration such as transom panel, louver, vision panel, frame material, thickness of metal, leaf construction, core type, door set type (single, double or double egress), etc., must be covered by the test certificate or global assessment report issued by the testing agency.

2. INDIAN / BRITISH

IS 3614, Part 2, BS 476, Parts 20 & 22.
Building Regulations 2000-Fire Safety-Part B.

- Labeling is not obligatory but recommended.
- According to IS / BS, a fire door can be tested without having leaf of an active latch bolt but with only a self-closing device.
- A fire door MUST be self-closing. Only the active door leaf of an access panel (service ducts) or cupboards, can however be installed without a closer but with a dead lock and a "Fire Door, Keep Shut" sign placed clear on the door face.
- Unless shown to be satisfactory when tested as part of a fire door assembly, the components of any hinge on which the door is hung should be made entirely from materials having a melting point of at least 800° C.
- If a fire door is held open, it must be equipped with a tested, automatic release mechanism actuated by an automatic fire detection and alarm system, fusible link (not if door is fitted in an opening provided as means of escape), or a door-closed delay device.
- Two fire doors may be fitted in the same opening so that the total fire resistance is the sum of their individual fire resistances.
- Signs and other items of hardware containing plastic should not be fitted on the non-fire side of the metal door or frame.

FIRE RATING INDICATIVE CHART

| S.No. | Description and use of opening | Wall rating (Hours) | Door & frame rating (Minutes) | |
|-------|---|---------------------|-------------------------------|-----------------------------|
| | | | SDI 118-01 | BS 476 / EN 1634 / IS 3614* |
| 1 | Walls that separate buildings or divide a single building into designated fire areas | 4 | 180 | 120 |
| 2 | Enclosures of vertical communication through buildings, such as stairwells and elevator shafts. | 2 | 90 | 60 |
| 3 | Door assemblies dividing occupancies in a building | 1 | 60 | 60 |
| 4 | Openings in corridors or room partitions | 1 | 45 | 30 |
| 5 | Openings in walls with potential severe fire exposure from exterior of building | 2 | 90 | 60 |
| 6 | Walls with potential moderate fire exposure from exterior of building | 1 | 45 | 30 |

* Data compiled from "Building Regulations - 2000 / Fire Safety Approved Document B". Assumption: For buildings not sprinkled and at a height of 18 mts and basement not more than 10 mts deep from the ground level. For different cases, please refer to original document.



Fire door



General door



Scientific door

SELECTION

Standard steel doors are classified in four levels:

Level 1: 45 mm - 35 mm (1 $\frac{3}{4}$ " - 1 $\frac{3}{8}$ ")

Level 2: 45 mm (1 $\frac{3}{4}$ ")

Level 3: 45 mm (1 $\frac{3}{4}$ ")

Level 4: 45 mm (1 $\frac{3}{4}$ ")

Each of the four levels noted offer a range of construction models and designs to meet architectural requirement for preference and appearance. The standard steel door construction models are full flush, seamless and stile and rail.

Standard steel door grades and models

| Level | Model | Full flush or Seamless | | | Construction | |
|-------|------------------|------------------------|-------|-------|--------------|--------------|
| | | MSG No. | IP in | SI mm | | |
| 1 | Standard Duty | 1 | 21 | 0.032 | 0.8 | Full Flush |
| | | 2 | | | | Seamless |
| 2 | Heavy Duty | 1 | 18 | 0.048 | 1.2 | Full Flush |
| | | 2 | | | | Seamless |
| 3 | Extra Heavy Duty | 1 | 16 | 0.064 | 1.6 | Full Flush |
| | | 2 | | | | Seamless |
| | | 3 | | | | Stile & Rail |
| 4 | Maximum Duty | 1 | 14 | 0.067 | 2.0 | Full Flush |
| | | 2 | | | | Seamless |

*Stile and rails are 16 gauge; flush panels, when specified are 18 gauge.



Rail & Stile door



Wood grain door



Stainless Steel door

INDICATIVE CHART FOR SUGGESTED DOOR LEVELS & APPLICATION

| Building Types | Standard Steel Door Levels | | | Frequency of use | Door Type | | | | | |
|-------------------------------------|----------------------------|----------------------|----------------------------|------------------|------------|-------------|--------------|--------------|------------|----------|
| | Level 1 | Level 2 | Level 3 | | Full Flush | Half Glazed | Vision Panel | Fully Glazed | Glass lite | Louvered |
| | Std. Duty 1 3/8" | Heavy Duty 1 3/4" | Extra Heavy Duty 1 3/4" | | | | | | | |
| APARTMENT | | | | | | | | | | |
| Main Entrance | | ■ | ■ | High | ■ | ■ | | ■ | ■ | |
| Unit Entrance | ■ | ■ | ■ | Moderate | ■ | | | | | |
| Bedroom | ■ | | | Low | ■ | | | | | |
| Bathroom | ■ | | | Moderate | ■ | | | | | ■ |
| Closet | ■ | | | Low | ■ | | | | | ■ |
| Stairwell | | ■ | ■ | Moderate | | | ■ | | ■ | |
| DORMITORY | | | | | | | | | | |
| Main Entrance | | ■ | ■ | High | | ■ | | ■ | ■ | |
| Unit Entrance | ■ | ■ | | Moderate | ■ | | | | | |
| Bedroom | ■ | ■ | | Low | ■ | | | | | |
| Bathroom | ■ | ■ | | Moderate | ■ | | | | | ■ |
| Closet | ■ | ■ | | Low | ■ | | | | | ■ |
| Stairwell | | ■ | ■ | Moderate | | | ■ | | ■ | |
| HOTELS & MOTELS | | | | | | | | | | |
| Unit Entrance | ■ | ■ | | Moderate | ■ | | | | | |
| Bathroom | ■ | | | Low | ■ | | | | | |
| Closet | ■ | | | Low | ■ | | | | | ■ |
| Stairwell | | ■ | ■ | Moderate | | | ■ | | ■ | |
| Storage & Utility | | ■ | ■ | Moderate | ■ | | | | | ■ |
| HOSPITALS & NURSING HOME | | | | | | | | | | |
| Main Entrance | | | ■ | High | | ■ | | ■ | ■ | |
| Patients Room | | ■ | | Moderate | | | | | | |
| Stairwell | | ■ | ■ | Moderate | | | ■ | | ■ | |
| Operating & Exams | | ■ | ■ | High | | | | | | |
| Bathroom | | ■ | ■ | Low | | | | | | ■ |
| Closet | ■ | ■ | | Low | | | | | | ■ |
| Recreation | | ■ | | Moderate | | | ■ | | | |
| Kitchen | | ■ | ■ | Moderate | | | ■ | | | |
| INDUSTRIAL | | | | | | | | | | |
| Entrance & Exit | | | ■ | High | | ■ | | ■ | ■ | |
| Office | ■ | ■ | | Moderate | ■ | ■ | | | | |
| Production | | | ■ | High | | ■ | | | | |
| Toilet | | ■ | ■ | Low | ■ | | | | | ■ |
| Tool | | | ■ | Moderate | ■ | | | | | |
| Trucking | | | ■ | High | | ■ | | | | |
| Monorail | | | ■ | High | ■ | ■ | | | | |
| OFFICE | | | | | | | | | | |
| Entrance | | | ■ | High | | ■ | | ■ | ■ | |
| Individual Office | ■ | | | Low | ■ | ■ | | | | |
| Closet | ■ | | | Low | ■ | | | | | ■ |
| Toilet | | ■ | ■ | High | ■ | | | | | |
| Stairwell | | ■ | ■ | Moderate | | | ■ | | ■ | |
| Equipment | | ■ | ■ | Moderate | ■ | | | | | |
| Boiler | | ■ | ■ | Moderate | ■ | | | | | ■ |
| SCHOOLS & UNIVERSITIES | | | | | | | | | | |
| Entrance & Exit | | | ■ | High | | ■ | | ■ | ■ | |
| Classroom | | ■ | | Moderate | | ■ | | | ■ | |
| Toilet | | ■ | ■ | High | ■ | | | | | ■ |
| Gymnasium | | | ■ | Moderate | ■ | ■ | ■ | | | |
| Cafeteria | | ■ | ■ | Moderate | | ■ | | | | |
| Stairwell | | ■ | ■ | High | | | ■ | | ■ | |
| Closet | ■ | ■ | ■ | Low | ■ | | | | | ■ |

This table is only a guide based on SDI 108-99. Please consult ANSI A250.8 and applicable building codes for additional requirement. Note: Compliance with the local and national codes is the responsibility of the specifier.

Suggested Procedure for the selection of Swinging Fire Doors and Frames (UL / ANSI)

- A. Determine the appropriate building code.
- B. Check and fulfill the fire insurance company's requirements for the specific building.
- C. Basic Fire Door Requirements: Checklist
 1. A fire door must have a label attached.
 2. A fire door frame must have either an attached or an embossed label.
 3. A fire door must be self-latching.
 4. A fire door must be self-closing
 5. If a fire door is held open, it must be equipped with a listed heat responsive device, fusible link or a smoke detection device.
 6. A fire door must be free of any obstructions which could prevent the door from operating properly, i.e. wedge door stops, chains, hookbacks, etc.
 7. Only listed fire door hardware shall be used.
 8. A fire door must have steel bearing-type hinges. (Exception: Non-bearing plain steel hinges may be used if they are part of a listed assembly.)
 9. Doors swinging in pairs that require astragals shall have at least one overlapping astragal. Pairs of doors within a means of egress shall not be equipped with an astragal that inhibits the free use of either leaf. For doors with astragal, a coordinator or open-back strike should be used to ensure proper closing.
 10. Fire doors with glass lights:
 - a. The glass frame and glazing bead must be metal.
 - b. The glass must be labeled wire glass not less than 6.4 mm (1/4") thick or as permitted by the labeling agency.
 11. Fire doors with fusible link louvers:
 - a. Only listed louvers can be used.
 - b. Louvers can be furnished in 45 mm (1 3/4") thick doors with a 1 1/2 hours or a 3/4 hour (no louver and glass light combinations are permitted).
 - c. Maximum louver size is 609 mm x 609 mm (24" x 24").
 - d. Louvers are not permitted to be installed in doors with fire exit hardware or in stairwells.
- D. For maximum fire protection, Standard Number 80 of the National Fire protection Association should be used for an installation guide.
- E. Purchase doors from a recognised, responsible manufacturer whose fire doors and frames are produced to conform to Fire Door procedures and are subject to periodic inspections.

FIRE DOORS 

Fire doors are designed to protect property and life in the event of a fire. For this, the door must serve as a fire and smoke barrier. Studies have shown that more people have lost lives due to smoke asphyxiation than fire.

Fire Doors must serve four main functions

- serve as a regular door at all times
- provide ready egress from a fire area during a fire
- inhibit spreading of fire
- protect life and property by reducing smoke hazards.

When an opening requires strength, durability, or maximum fire resistance, steel doors and frames provide the qualities to meet these needs. Due to growing access control needs, fire doors have today evolved to accommodate the growing electrified functions a door must support.

Designed to meet the life-safety requirements in various types of buildings and structures, Shakti fire doors help compartmentalise and contain the spread of fire. These doors complement existing passive fire-fighting systems. These doors also meet all the stipulated international, national and regional fire safety standards.

These doors are available with honeycomb core as standard infill material with other optional cores. These doors are rated for 45, 60, 90, 100, 120, 180 and 240 minutes fire withstanding ability. All fire doors are factory finished with epoxy primer and polyurethane-finish paint.

APPLICATIONS

These doors can be used in high-rise buildings, metro railway stations, telecom centers, power plants, cellular network stations, garment processing units, shopping malls, industrial plants, multiplexes, hotels, auditoriums, software parks, restaurants, etc. Shakti doors and frames are designed to perform and in the most demanding environment.

FEATURES

- Available in galvanised or stainless steel
- Honeycomb core infill for structurally flat surface
- Shutter thickness of 46 mm
- Fire rating 60 to 240 minutes for stability and integrity (IS/BS)
- UL labelled doors for 45, 90, 180 minutes
- Clear vision lite up to 120 minutes' fire rating
- No welding joints and sharp edges, interlocking at the stiles
- Factory prepped to receive all mortised hardware specified
- High aesthetics and robust structure
- Fully flush constructions
- Easy to install on a flush wall opening & dry wall partitions
- Can be supplied in a wide range of colours.

OPTIONAL FEATURES

- Insulated doors with 90 minutes of rating to IS & BS
- Wood Grain can be provided as an optional finish.

STANDARDS & CERTIFICATIONS

- Tested to UL10C and confirming to NFPA 80
- Fire doors are tested as per IS 3614 Part 2 and BS 476 Part 20 & 22
- Single leaf flush fire doors are tested for maximum rating of 240 minutes
- Double doors and doors with vision lite are tested for both 60 and 120 minutes
- Doors are tested at CBRI (Central Building Research Institute) and ARAI (Automotive Research Association of India, a research institution of the automotive industry with the Ministry of Heavy Industries & Public Enterprises, Government of India.)



Underwriters Laboratory.

WARRANTIES

All our products carry a warranty of 1 year against manufacturing defects.



DOOR FRAMES

MATERIAL - OPTIONS

| | |
|------------------|-----------------|
| Galvanised Steel | Stainless Steel |
|------------------|-----------------|

SHEET THICKNESS

| | | | |
|--------------------|-----|-----|-----|
| Gauge | 14 | 16 | 18 |
| Millimeters | 2.0 | 1.6 | 1.2 |

TECHNICAL DATA FOR STANDARD FRAMES (D x H)

| | | | |
|------------------------------------|----------------|---------------|--------|
| Size of double rebate frame | (143 x 57 mm)* | | |
| Size of single rebate frame | (100 x 57 mm) | (100 x 69 mm) | |
| Frame assembly | Mitered | Butted | Welded |

*Other sizes are available. Max depth for Labelled doors can be 350 mm.

STANDARD HEIGHTS (WALL OPENINGS)

| | | | | | |
|--------------------|------------------------------------|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Inches | 6'10 ³ / ₄ " | 7'2 ⁵ / ₈ " | 7'10 ¹ / ₂ " | 8'10 ¹ / ₄ " | 9'10 ¹ / ₈ " |
| Millimeters | 2100 | 2200 | 2400 | 2700 | 3000 |

Note: For actual frame opening size please see the door data sheet for both labelled and BS/IS doors.

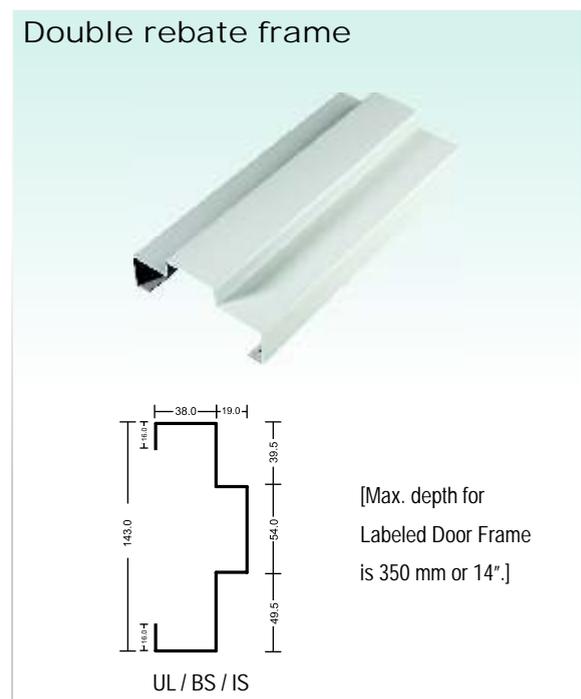
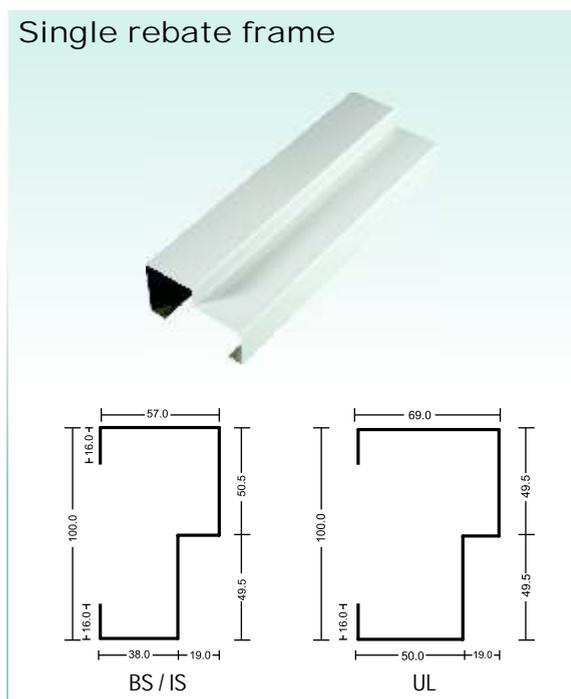
FRAMES

Available in mitered joint and butted assembly, our frames are supplied in knock down form for easy assembly at site. For fire doors with two hours of rating, the standard frame profile will be double rebate. Welded frames are supplied on special request.

FEATURES

- Made out of galvanised and stainless steel
- Frames available in single and double rebate
- All frames are prepared for receiving hardware at site
- Frames can also be designed for flush fixing
- Primed and finish painted.

STANDARD DESIGN



HARDWARE PREPARATION

The door design is pre-determined and all doors are completely factory made. No work is done on-site.

Hinge Jamb

5.0 mm thick steel hinge reinforcement welded to the frame for receiving the hinge at site.

Strike Jamb

3 mm thick steel lock strike reinforcement with tapped holes welded to the frames.

Mortar Guard

1.2 mm thick steel plaster guard or mortar guard is provided at the back of all hardware cutouts in the frame except for hinges which have a special snap on mortar guard.



Hinge Jamb



Strike Jamb



Strike-Mortar Guard



Hinge-Mortar Guard

FRAME ASSEMBLY DETAILS



Mitered Joint (Double rebate)



Bolted Joint (Double rebate)



Welded Joint (Double rebate)

(Mitered and bolted joint frames are supplied in knock down form)

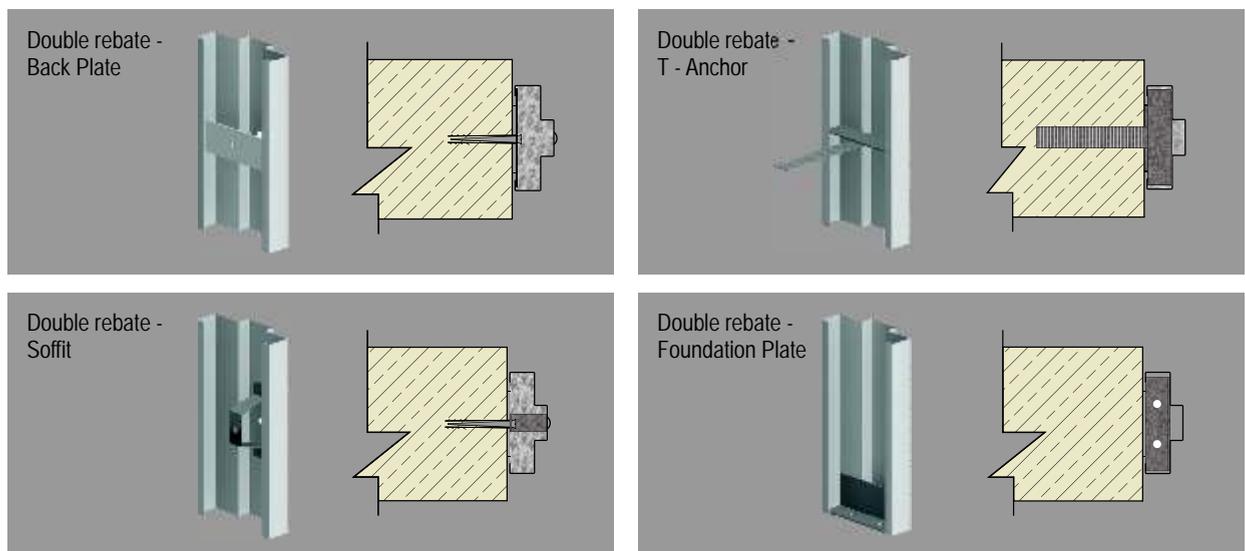
ANCHORING AND FIXING DETAILS (OPTIONS)

Frames can be designed for fixing on typically plastered opening, masonry opening or dry wall partitions. Shakti offers a wide range of unrivalled options in aesthetics and finishing.

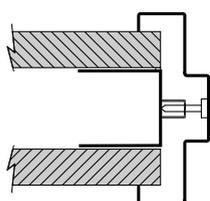
Tee-Anchoring: First fix provides maximum engagement into the constructed wall, with slip-on anchors made out of galvanised steel.

Expansion Anchors: Used in masonry openings or finished plastered openings. The frames are bolted to the clear opening with 8 mm expansion anchors. Screws are rested on the backplate.

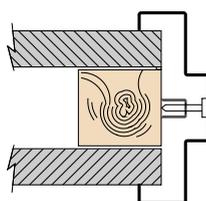
Bolted Anchors: Frames fixed on 'C' Channel are bolted directly on to the back plate.



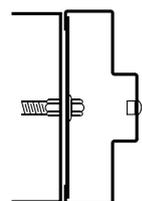
DRY WALL FIXING



Frames installed with steel stud



Frames installed with wood stud



Frames installed on 'C' channel



DOOR LEAF

MATERIAL - OPTIONS

| | |
|------------------|-----------------|
| Galvanised Steel | Stainless Steel |
|------------------|-----------------|

SHEET THICKNESS

| Gauge | 16 | 18 | 20 | 22 |
|-------------|-----|-----|-----|-----|
| Millimeters | 1.6 | 1.2 | 1.0 | 0.8 |

TECHNICAL DATA FOR DOOR LEAF

| | Single Leaf | Pair of Leaf |
|-----------------------------------|----------------------|----------------------|
| Non-temperature rise doors | | |
| Door thickness | 46 mm (1 3/4") | 45 mm (1 3/4") |
| Min. door opening width | 357 mm (1' 2") | 711 mm (2' 4") |
| Max. door opening width | 1200 mm (3' 11 1/4") | 2397 mm (7' 10 3/8") |
| Max. door opening height | 3000 mm (9' 10 1/8") | 3000 mm (9' 10 1/8") |
| Temperature rise doors | | |
| Max. door opening width | 1200 mm (3' 11 1/4") | - |
| Max. door opening height | 2743 mm (9' 0") | - |

Note: The sizes mentioned above are for the door leaf and does not include the frame.

DOOR LEAF

Door Leaf Design Feature

Shakti Fire Doors are designed to be fully flush without any joints or welding marks on the surface of the door. The door is constructed with interlocking arrangements at the stile edges with the infill material honeycomb kraft. Steel reinforcement is provided for structural stability and integrity. The doors are available in both galvanised steel and satin stainless steel. Doors are factory finished in all aspects for receiving hardware and etched primed to take final coat of polyurethane paint.

Stainless steel doors are available in No. 2B or No. 4 finishes.

Door leafs are available with the following options:

Fully flush

This design does not have any provision for fixing of the options like glass or louvers. It is fully flush on both sides.

With vision lite

Shutters can be provided with vision lite for visibility. The glass is available in circular and rectangular sizes.

| Vision Lite sizes in (mm) - W x H | |
|-----------------------------------|------------|
| V | 250 x 250 |
| N | 125 x 500 |
| C | 380 ϕ |
| R | 200 x 300 |

Note:

- The sizes mentioned above are for 1½ hrs. labeled doors and 2 hrs. of IS/BS doors.
- Labeled doors with 3/4 hr rating can have glass of 1296 sq. inches / vision lite.
- Max width / height is 54" for vision lite of size 1296 sq. inches.
- Max width for 100 sq. inches is 12" and max height in 33".
- Circular Vision Lite for Labelled doors is max 280 ϕ .

FEATURES

- Available in both galvanised and stainless steel
- Interlocking arrangement at stiles
- Fully flush and flat surface
- Optional insulated infill material
- Factory prepped to take any hardware
- Rounded edges for safety in use
- High aesthetics and robust structure
- Wide range of fire rated clear vision lite
- Maintenance-free doors.

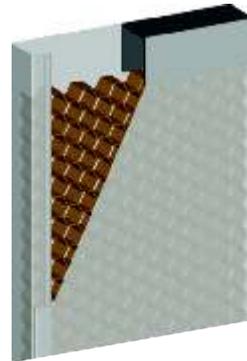
Louvers

Labeled doors can be provided with optional louvers with fusible link for a maximum size of 24" x 24" in 1½ hrs. rated doors. Not applicable on BS / IS doors.

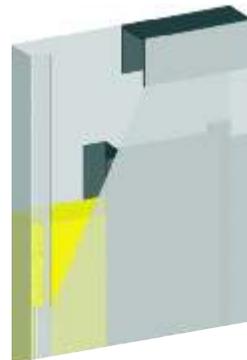


INFILL

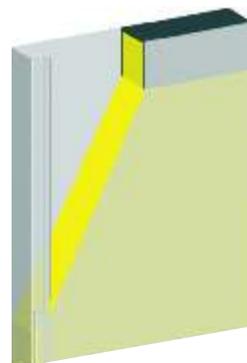
Honeycomb Kraft paper with its unique properties enhances the structural integrity of the doors with minimal additional weight to the door. The final finish on the door is predominantly dependent on the quality of the honeycomb kraft and the glue which is used to get the flat surface. This infill material invariably has high crushing strength leading to impact resistance. The quality and consistent flat surface achieved because of the infill material is exceptional to the material and design of the doors.



Steel Stiffened Doors: Used for exterior applications, these doors are known for their rigidity and are available in varying strength and quality. While the thickness of the stiffeners can vary, we offer stiffeners of 20 gauge galvanised steel. Spacing between stiffeners may vary from 4” to 6”. They are welded to each other at the top and bottom and to the inside door skin. The cavities are filled with special core. For temperature rise doors, all cavities are filled with mineral rock wool.



Polyurethane Foam is used as an insulator and provides complete surface support, impact resistance and exceptional thermal resistance. It offers the lowest “U” value (approx. 0.09) and the highest “R” factor (approx. 11.1). This core has certain limitations on application and fire rating of the doors. Not recommended for use on BS/IS fire doors.



Polystyrene: Polystyrene slab core is viewed primarily for its insulation value, rather than its structural value. It is used mainly for exterior applications or where a greater temperature differential from one side of the door to the other is needed. Its lower service temperature (approximately 74° C) may prevent a manufacturer with a baked – on enamel paint system from applying a factory finish, since the elevated temperature during the drying (baking) operation could melt the core. Not recommended for use on BS/IS standard doors.



UL Labeled Doors

Shakti Met-Dor offers UL labeled doors as per the American standards NFPA 80-1999, NFPA 252-1995, UL 10B, UL10C and UBC 7-2. Doors are tested under two categories covering both temperature rise (Steel Stiffened) and non-temperature rise doors.

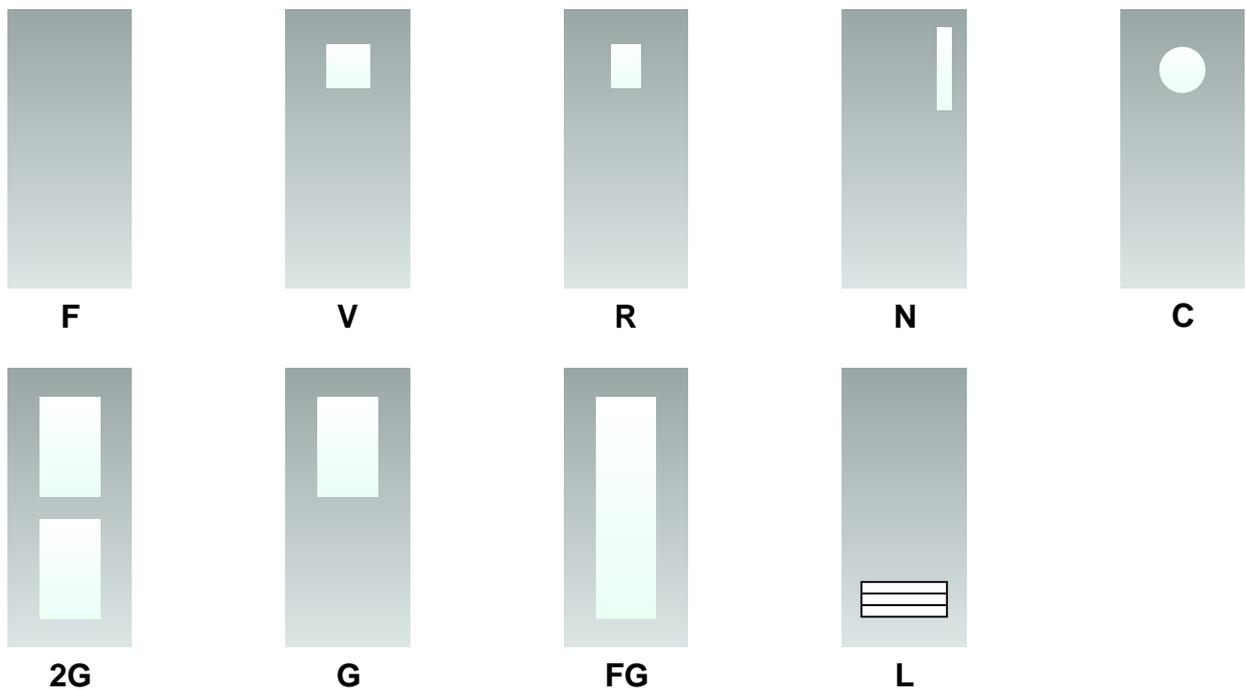
Frames

- Frames are tested for use as a component in fire door assemblies that meet the requirements of UL10C, UBC 7-2 (1997) Part I (positive pressure) and UBC 7-2 (1997) Part II (air leakage / smoke, "S")
- Door frames for use as a component in fire door assemblies that meet the requirements of UL10B (neutral pressure)
- Three-sided steel frame with or without transoms, single swing and pairs, of welded or knockdown / welded construction.

Doors

- Swinging doors are tested for a maximum of 3 hrs. for hollow metal type and 1½ hrs. for composite metal doors, both single and pairs with astragal.
- 3 hrs. rating for non-temperature rise.
- 1½ hrs. for 232°C temperature rise (30 minutes) for hollow metal type and 1½ hrs. for 120°C temperature rise (30 minutes) for composite type.

DOOR ELEVATIONS



For doors with larger vision lite, we can offer 3/4 hr. rating for labelled doors.

Max. vision lite of 1296 sq. inches / vision lite.

When doors with louvers are specified, we can offer the same with labelled fusible link. Not applicable on smoke check doors, BS/IS doors or doors with vision lite.

DATA SHEET FOR UL LABELLED / FIRE RATED DOORS AND FRAMES

| | Non-temperature Rise Doors | | | Temp Rise Doors |
|-----------------|--------------------------------|----------------------------------|------------------------------|---------------------------|
| Infill | Honey Comb Core / Polyurethane | | | Special Core |
| Label | A | B | C | T |
| Rating | 3 hours | 1½ hours | ¾ hours | 1½ hours |
| Max. Glass Area | - | 100 sq.in. (0.06 sq.m.) per door | 1296 sq. in.** (0.84 sq. m.) | 100 sq. in. (0.06 sq. m.) |

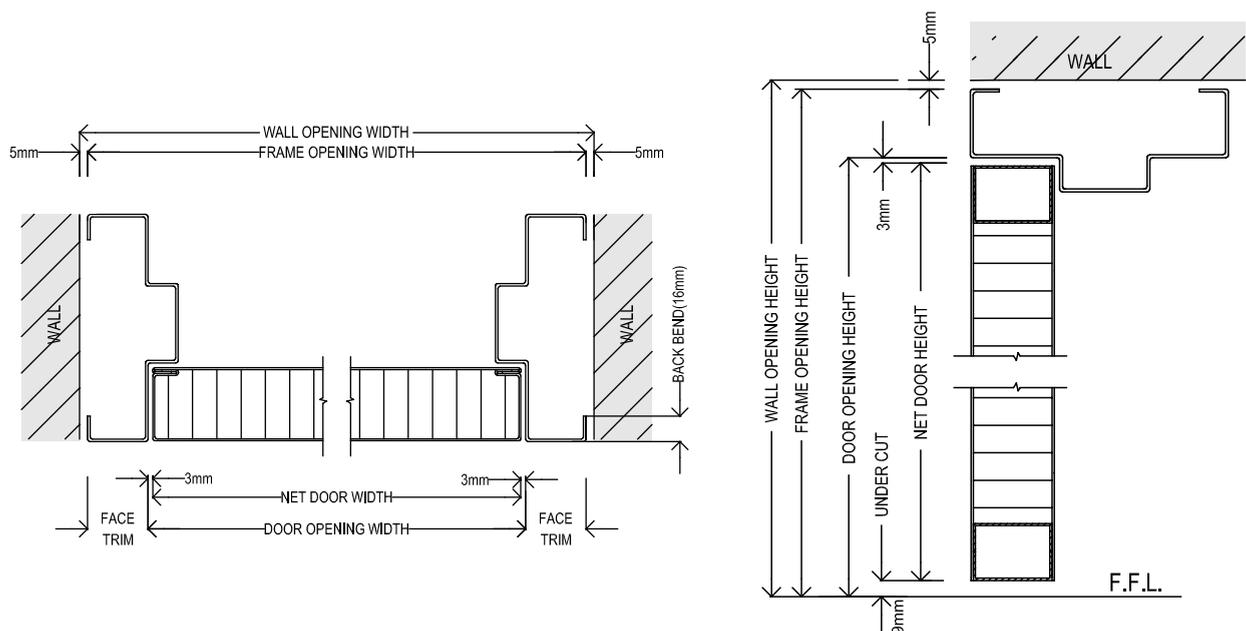
**1296 sq. in perlite. Not to exceed 54" w or h.

| Single Leaf | | UL Label rating | | | |
|--|---------------------------------------|----------------------------|----------|--------|-----------------|
| | | Non-temperature Rise Doors | | | Temp Rise Doors |
| Doors | Max. Size | 3 hours | 1½ hours | ¾ hour | 1½ hours |
| Honey Comb core / Polyurethane / Polystyrene | | | | | |
| G 20, G 18, G 16 | 1200 mm x 2438 mm (3' 11¼" x 8' 0") | A | B | C | |
| G 20, G 18, G 16 | 1200 mm x 3000 mm (3' 11¼" x 9' 10⅞") | | B | C | |
| Steel Stiffened Doors / Special core | | | | | |
| G 18, G 16 | 1200 mm x 2743 mm (3' 11¼" x 9' 0") | A | B | C | T |
| G 18, G 16 | 1200 mm x 3050 mm (3' 11¼" x 10' 0") | A | B | C | |
| Lead Line Doors | | | | | |
| G 18, G 16 | 1200 mm x 2438 mm (3' 11¼" x 8' 0") | A | B | C | T |

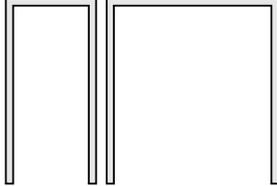
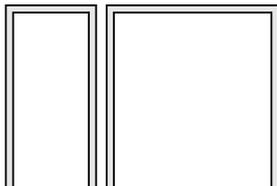
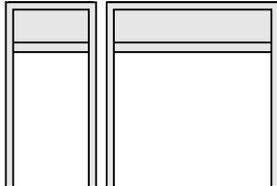
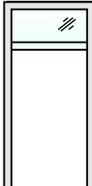
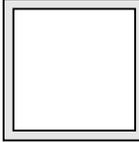
DATA SHEET FOR UL LABELLED FIRE RATED DOORS AND FRAMES

| Pair of Leafs | | UL Label rating | | | |
|--|--|----------------------------|----------|--------|-----------------|
| | | Non-temperature Rise Doors | | | Temp Rise Doors |
| Doors | Door opening sizes | 3 hours | 1½ hours | ¾ hour | 1½ hours |
| Honey Comb Core / Polyurethane / Polysterene | | | | | |
| G 20, G 18, G 16 | 2397 mm x 2438 mm (7' 10¾" x 8' 0") | A | B | C | |
| G 20, G 18, G 16 | 2397 mm x 3000 mm (7' 10¾" x 9' 10½") | | B | C | |
| Steel Stiffened Doors / Special Core | | | | | |
| G 18, G 16 | 2397 mm x 3000 mm (7' 10¾" x 9' 10½") | A | B | C | |
| Lead Line Doors | | | | | |
| G 18, G 16 | 2397 mm x 2438 mm (7' 10¾" x 8' 0") | A | B | C | |

ILLUSTRATIVE DOOR OPENING WIDTH & HEIGHTS



DATA SHEET FOR UL LABELLED FIRE RATED DOORS AND FRAMES

| Frame Type | Door Size | | | Frame Size | | |
|--|-----------------|--|-------------|---|--|--|
| | Type | Max. Door Size | Max. Rating | Jamb Depth | Max. Panel Size | Max. Overall Size |
| Three sided frames | | | | | | |
|  | Masonry Fixing | Single: 1200 mm x 3000 mm (3' 11 3/8" x 9' 10 1/8") Pair: 2397 mm x 3000 mm (7' 10 3/8" x 9' 10 1/8") | 3 hours | Min. 75 mm (3") Max. 350 mm (14") | | Single: 1276 mm x 3038 mm (4' 2 1/4" x 9' 11 5/8") Pair: 2473 mm x 3038 mm (8' 1 3/8" x 9' 11 5/8") |
|  | Dry wall Fixing | Single: 1200 mm x 3000 mm (3' 11 3/8" x 9' 10 1/8") Pair: 2397 mm x 3000 mm (7' 10 3/8" x 9' 10 1/8") | 1 1/2 hours | Min. 121 mm (4 3/4") Max. 229 mm (9") | | Single: 1276 mm x 3038 mm (4' 2 1/4" x 9' 11 5/8") Pair: 2473 mm x 3038 mm (8' 1 3/8" x 9' 11 5/8") |
| Transom frames with Panel | | | | | | |
|  | Masonry Fixing | Single: 1200 mm x 2438 mm (3' 11 1/4" x 8' 0") Pair: 2397 mm x 2438 mm (7' 10 3/8" x 8' 0") | 1 1/2 hours | Min. 121 mm (4 3/4") Max. 305 mm (12") | Single: 1200 mm x 1016 mm (3' 11 1/4" x 3' 4") Pair: 2397 mm x 1016 mm (7' 10" x 3' 4") | Single: 1276 mm x 3050 mm (4' 2 1/4" x 10' 0") Pair: 2473 mm x 3050 mm (8' 1 3/8" x 10' 0") |
| Transom frames with Glass | | | | | | |
|  Max. Glass area: 0.836 Sq.m (1296 sq.in) | Masonry Fixing | Single: 1200 mm x 2438 mm (3' 11 1/4" x 8' 0") | 3/4 hour | Min. 113 mm (4 1/2") Max. 305 mm (10 1/2") | Single: 1200 mm x 1016 mm (3' 11 1/4" x 3' 4") | Single: 1276 mm x 3050 mm (4' x 10') |
| Borrowed Lite frames | | | | | | |
|  Max. Glass area: 0.836 Sq.m (1296 sq.in) | Masonry Fixing | Single: 1016 mm x 1016 mm (3' 4" x 3' 4") | 3/4 hour | Min. 113 mm (4 1/2") Max. 305 mm (10 1/2") | | |

*Overall frame size shown is for a double rebate frame of dimension 143 x 57. However larger openings can be obtained by changing the face trim.

DATA SHEET FOR STANDARD FIRE RATED DOORS TESTED AS PER BS / IS STANDARD (Wall opening sizes)

Flush Door with Honey Comb Infill material

■ Yes

| Single Doors | | Fire rating | | | | |
|--------------|-------------------|-------------|--------|---------|---------|---------|
| Door / Frame | Max. Wall Opening | 60 min | 90 min | 100 min | 120 min | 240 min |
| G 18, G 16 | 1010 mm x 2100 mm | ■ | ■ | ■ | ■ | ■ |
| G 18, G 16 | 1200 mm x 2440 mm | ■ | ■ | ■ | ■ | |
| G 22, G 18 | 1200 mm x 2200 mm | ■ | | | | |
| G 18, G 16 | 1200 mm x 3000 mm | ■ | ■ | ■ | | |

| Pair of Doors | | Fire rating | | | | |
|---------------|-------------------|-------------|--------|---------|---------|---------|
| Door / Frame | Max. Wall Opening | 60 min | 90 min | 100 min | 120 min | 240 min |
| G 22, G 18 | 2000 mm x 2200 mm | ■ | | | | |
| G 18, G 16 | 2000 mm x 2440 mm | ■ | ■ | ■ | ■ | |
| G 18, G 16 | 2315 mm x 3000 mm | ■ | ■ | ■ | | |

Insulated Infill material

| Single Doors | | Fire rating | | | | |
|--------------|-------------------|-------------|--------|---------|---------|---------|
| Door / Frame | Max. Wall Opening | 60 min | 90 min | 100 min | 120 min | 240 min |
| G 22, G 18 | 1200 mm x 2400 mm | ■ | | | | |
| G 18, G 16 | 1200 mm x 2200 mm | ■ | ■ | | | |

Vision Lite Door with Honey Comb Infill material

| Single Doors | | Fire rating | | | | |
|--------------|-------------------|-------------|--------|---------|---------|---------|
| Door / Frame | Max. Wall Opening | 60 min | 90 min | 100 min | 120 min | 240 min |
| G 18, G 16 | 1200 mm x 2440 mm | ■ | ■ | ■ | ■ | |
| G 22, G 18 | 1200 mm x 2200 mm | ■ | | | | |
| G18, G16 | 1200 mm x 3000 mm | ■ | ■ | ■ | | |

| Pair of Doors | | Fire rating | | | | |
|---------------|-------------------|-------------|--------|---------|---------|---------|
| Door / Frame | Max. Wall Opening | 60 min | 90 min | 100 min | 120 min | 240 min |
| G 22, G 18 | 2000 mm x 2200 mm | ■ | | | | |
| G 18, G 16 | 2000 mm x 2400 mm | ■ | ■ | ■ | ■ | |
| G 18, G 16 | 2315 mm x 3000 mm | ■ | ■ | ■ | | |

Note: The sizes mentioned above are the maximum wall opening as tested.

FINISHES

Wood Grain Finish

Wood Grain doors offer the perfect combination and alternative for architects who prefer to use “Steel” over “Timber”. These doors offer the ‘elegance of wood’ with ‘strength of steel’.

Features

- Aesthetically superior
- Robust structure
- Fully flush construction
- Vermin proof
- Never warps.



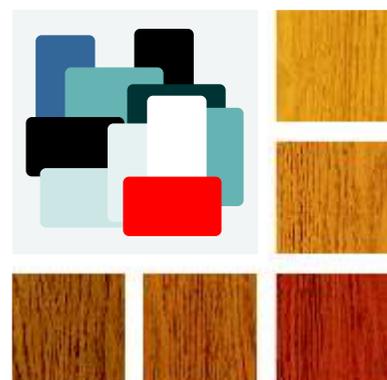
Stainless Steel Finish

We can offer any door in stainless steel 304 grade with No. 2B and No. 4 finishes.



Painted Finishes

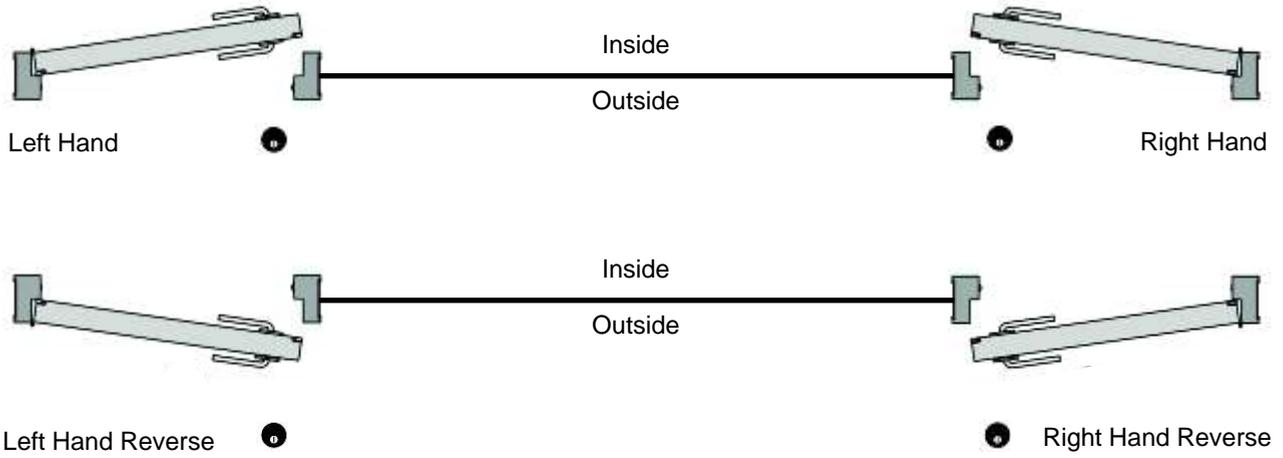
All our steel doors are factory finished and etched primed to take any paint. We offer a wide range of semi gloss polyurethane paint finishes, with a total of 70 microns on the surface of the door and frame. Doors are all oven baked for increased performance and covered with protective tape.



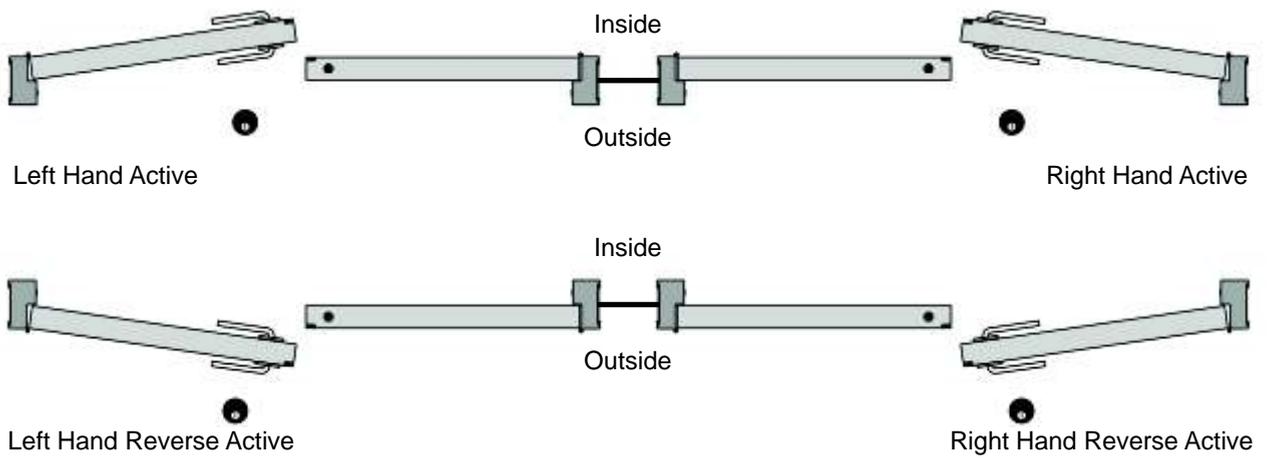
Shades shown above are indicative.

UNIVERSAL HANDING OF DOORS

Single leaf door



Double leaf door



SPECIFICATION – UL LABELED DOORS**PART ONE: GENERAL****1.01 Scope**

Specification covers the design, supply of materials, manufacture and installation of factory made special type of approved make steel fire doors of 45 minutes', 90 minutes' and 180 minutes' fire rated labelled doors. Manufactured and installed by Shakti Met-dor and tested to UL 10C standards, conforming to NFPA 80 and ANSI A250.8.

PART TWO: PRODUCTS**2.01 Material and Finishes**

A. Material - Frame to be manufactured from 1.60 mm (16 gauge) galvanised steel sheets complying with the latest IS 277 Code of GPL Grade with Z 120 Coating or its Equivalent British Standard. Fire door shutter to be manufactured from 1.25 mm (18 gauge) galvanised sheets.

B. Finishes – Frames and Shutters to be suitably cleaned with solvents and etch primed for receiving primer and top coats. Shutters to be primed in zinc phosphate stoving primer (35 microns DFT).

Optional Finishes

- a. Shutters to be finished in thermo setting Polyurethane paint (35 microns DFT) of approved colour and make as specified by the architect.
- b. Stainless steel doors to be finished to number four matt finish.
- c. Wood grain finish of approved texture to be provided as a final finish on doors and frames as recommended by the architect.

2.02 Construction of Frames

Door frame profile to be double rebated of dimension 143 mm x 57 mm (+ / - 0.3) with bending radius of 1.4 mm. All preparations and reinforcements shall be conforming to UL test procedures as per the required fixing methodology outlined in the schedule. All frames to have reinforcement pads for fixing of door closer, at appropriate location as per manufacturer's details.

Frames to have factory finished pre-punched cut-outs to receive specific hardware and ironmongery along with the requisite mortar guard. Frames to be provided with hinge plates pre-drilled to receive hinges for screw mounted fixing. Frames to have rubber shutter silencer on strike jambs for single shutter frames and on the head jambs for double shutter frames. Provide knockdown field assembled type frames unless otherwise indicated. Provide frames, other than slip-on drywall type with a minimum of three anchors per jamb suitable for the adjoining wall construction.

2.03 Construction of Doors

Doors to be press formed to 46 mm thick double skin hollow door with lock seam joints at stile edges. Doors to have no visible screws or fasteners on either face. Doors should have an interlocking arrangement at the stile edges for flat surface on either side. Internal reinforcement to be provided at top bottom and stile edges for desired fire rating. Doors to be factory prepared with pre-punched cutouts and reinforcements to receive ironmongery as per final finish hardware schedule. Doors to have pre-drilled hinge plates. Doors with locks to have concealed lock box with lock fixing brackets with pre-tapped holes. Doors with door closer reinforcement pads to be provided at appropriate locations as per manufacturer's design. Maximum size of the vision panel shall be 100 square inches per leaf and no dimension shall exceed 33 inches.

Optional Infill

- a. Honey comb core: Doors shall be reinforced with honey comb core completely filling the inside of the doors and laminated to inside faces of both panels.
- b. Steel Stiffened: Doors shall be stiffened with steel stiffeners and sound deadened with special core as the infill material. The stiffeners should be fabricated from 20 gauge (0.8 mm) steel located between 4" to 6" interval and welded at the top and bottom. Steel stiffened doors to be provided in areas as and where specified.

c. Polyurethane Core: Doors shall be stiffened and filled with sound deadened and insulated with a rigid polyurethane core bonded to the inside of the door.

PART THREE: INSTALLATION

3.01 Installation of Frames and Doors

All frames and doors should be installed on the respective openings with right fasteners and as

recommended by the manufacturer. After fixing, the frame shall be grouted with cement mortar 1:3 or Plaster of Paris or Gypsum powder as approved. Gap between frame and wall to be closed by cement pointing using cement mortar 1:3.

SPECIFICATION – FOR FIRE DOORS AS PER BS / IS

PART ONE: GENERAL

1.01 Scope

Specification covers the design, supply of materials, manufacture and installation of factory made special type of approved make steel fire doors of 60 minutes', 120 minutes' and 240 minutes' fire rating. Manufactured and installed by Shakti Met-dor and tested at CBRI / ARAI to IS 3614 part 2 and BS 476.

PART TWO: PRODUCTS

2.01 Material and Finishes

A. Material - Frame to be manufactured from 1.60 mm (16 gauge) galvanised steel sheets complying with latest IS 277 Code of GPL Grade with Z 120 Coating or its Equivalent British Standard. Fire door shutter to be manufactured from 1.25 mm (18 gauge) galvanised sheets.

B. Finishes – Frames and shutters to be suitably cleaned with solvents and etch primed for receiving primer and top coats. Shutters to be primed in zinc phosphate stoving primer (35 microns DFT).

Optional Finishes

- a. Shutters to be finished in thermo setting Polyurethane paint (35 microns DFT) of approved colour and make as specified by the architect.
- b. Stainless steel doors to be finished to number four matt finish.
- c. Wood grain finish of approved texture to be provided as a final finish on doors and frames as recommended by the architect.

2.02 Construction of Frames

Door frame profile to be double rebated of dimension 143 mm x 57 mm (+ / - 0.3) with bending radius of 1.4 mm. All preparations and reinforcements shall be conforming to BS test procedures as per the required fixing methodology outlined in the schedule. All frames to have reinforcement pads for fixing of door closer, at appropriate location as per manufacturer's details. Frames to have factory finished pre-punched cut-outs to receive specific hardware and ironmongery along with the requisite mortar guard. Frames to be provided with hinge plates pre-drilled to receive hinges for screw mounted fixing. Frames to have rubber shutter silencer on strike jambs for single shutter frames and on the head jambs for double shutter frames. Provide knockdown field assembled type frames unless otherwise indicated. Provide frames, other than slip-on drywall type with a minimum of three anchors per jamb suitable for the adjoining wall construction.

2.03 Construction of Doors

Doors to be press formed to 46 mm thick double skin hollow door with lock seam joints at stile edges. Doors to have no visible screws or fasteners on either face. Doors should have an interlocking arrangement at the stile edges for flat surface on either side. Internal reinforcement to be provided at top, bottom and stile edges for desired fire rating. Doors to be factory prepared with pre-punched cut-outs and reinforcements to receive ironmongery as per final finish hardware schedule. Doors to have pre-drilled hinge plates

with hinge guard covers. Doors with locks to have concealed lock box with lock fixing brackets with pre-tapped holes. Doors with door closer reinforcement pads to be provided at appropriate location as per manufacturer's design.

Optional Infill

- a. Honey comb core: Doors shall be reinforced with honey comb core completely filling the inside of the doors and laminated to inside faces of both panels.
- b. Mineral wool core: High density mineral wool core should be used as infill material for insulated doors.

PART THREE: INSTALLATION

3.01 Installation of Frames and Doors

All frames and doors should be installed on the respective openings with right fasteners and as recommended by the manufacturer. After fixing, the frame shall be grouted with cement mortar 1:3 or Plaster of Paris or Gypsum powder as approved. Gap between frame and wall to be closed by cement pointing and frames to be filed with cement mortar 1:3 if approved.

DELHI

Shakti Met-Dor Limited
615, 6 Floor Somdutt Chamber - II,
9, Bikaji Cama place,
New Delhi - 110 066, India.
Ph: 0091 - 11 - 39449581
Fax: 0091 - 11 - 26171422
e-mail: delhi.sales@shaktimetdor.com

MUMBAI

Shakti Met-Dor Limited
421, 4 Floor, Hind Rajasthan Building,
95, Dr. Dadasaheb Phalke Road, Dadar (E)
Mumbai - 400 014, Maharashtra, India.
Ph: 0091 - 22 - 24158881
Fax: 0091 - 22 - 24148276
e-mail: mumbai.sales@shaktimetdor.com

KOLKATA

Shakti Met-Dor Limited
BK 316, Sector II, Salt Lake City,
Kolkata - 000 091, West Bengal, India.
e-mail: kolkata.sales@shaktimetdor.com

HYDERABAD

Shakti Met-Dor Limited
Plot No. 20, Sripuri Colony, Kharkhana,
Secunderabad - 500 015, Andhra Pradesh, India.
Ph: 0091 - 40 - 24840394 / 0395
Fax: 0091 - 40 - 27892327
e-mail: hyderabad.sales@shaktimetdor.com

CHENNAI

Shakti Met-Dor Limited
Dev Apartments, 5/8, 1 Main Road,
Kasthuribai Nagar, Adyar,
Chennai - 600 020, Tamil Nadu, India.
Ph: 0091 - 44 - 32950967
Fax: 0091 - 44 - 24423620
e-mail: chennai.sales@shaktimetdor.com

BANGALORE

Shakti Met-Dor Limited
Arora & Associates, 111/1 & 111/2,
Dickenson Road, Nr. Manipal Centre,
Bangalore - 560 042, Karnataka, India.
Ph: 0091 - 80 - 32916728
Fax: 0091 - 80 - 25599840
e-mail: bangalore.sales@shaktimetdor.com

GENERAL DOORS RAIL AND STILE DOORS
WOOD GRAIN DOORS SCIENTIFIC DOORS
FOLDABLE DOORS FIRE DOORS DUCT DOORS
TOILET CUBICLES EGRESS DOORS DUTCH DOORS
ACOUSTIC DOORS LEAD LINED DOORS
SLIDING DOORS CUSTOM MADE DOORS
STAINLESS STEEL DOORS CASEMENT WINDOWS
FIXED WINDOWS DOUBLE GLAZED FIXED WINDOWS



SHAKTI MET-DOR LIMITED

HEAD OFFICE: No. 20, Sripuri Colony, Karkhana, Secunderabad - 500 015, Andhra Pradesh, India.

Ph: 0091 - 40 - 27840394 / 5 | Fax: 0091 - 40 - 27892327.

e-mail: sales@shaktimetdor.com | URL: www.shaktimetdor.com