FLAME ARMOUR
FIRE-RESISTANT ROLLER SHUTTERS

STRUCTURAL RECOMMENDATIONS

SSS INDUSTRIAL DOORS

RIGID STRUCTURE
- Masonry / Concrete
- Up to 240 minutes

FLEXIBLE STRUCTURE
- Timber Stud Partition
- Up to 90 minutes

SERVERY HATCH
- Timber Stud Partition
- Up to 120 minutes

FLAME ARMOUR
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SUPPORTING TEST EVIDENCE

The Flame Armour Fire Resistant Roller Shutter product range has been tested in accordance with the standard BS EN 1634-1: 2014 + A1: 2018.

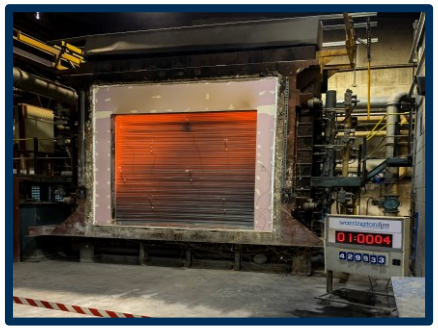
To cover larger applications and variations in scope, the extended application process has been carried out in conformity with BS EN 15269-1: 2011. This documentation is produced by the laboratory which undertook the initial testing and outlines the applicable scope and product variations (rules) stated within Extended Application standard. As outlined within WF Extended Application Report No. 416673, the primary scope is based upon WF Test Report No. 404452, with the additional test to an identical specimen installed into a timber stud partition to support this alternative wall type and use of alternative tubular motor.

The classification of fire resistance performance in accordance with EN 13501-2 is stated within WF Classification Report No. 416674. This document is available at request of the manufacturer and can be used to provide evidence of compliance for the scope of certified product.

Summary of Supporting Test Evidence for the Flame Armour product range:

WF Test Report No. 404452

- ✓ 'Flame Armour' product range
- ✓ Installed onto fire exposed face of masonry wall
- ✓ Achieved 260 minutes Integrity performance
- ✓ Classified for Integrity performance for periods of E60 / E90 / E120 / E240.



WF Test Report No. 429933

- ✓ 'Flame Armour' product range
- ✓ Installed onto fire exposed face of a timber stud partition
- ✓ Achieved 103 minutes integrity performance
- ✓ Classified for Integrity performance for period of E60 / E90

WF Test Report No. 552862

- ✓ 'Flame Armour+' product range
- ✓ Installed onto fire exposed face of a timber stud partition (incl. 900 mm dwarf wall)
- ✓ Achieved 120 minutes integrity performance

To clearly distinguish between a standard fire-resistant roller shutter and one purposely designed for a servery hatch application, the manufacturer has marketed the new and enhanced design under the product reference '**Flame Armour+**'. This new product provides direct test evidence for a fire-resistant roller shutter installed into a servery hatch configuration, providing evidence of the bottom rail being situated above finished floor level and exposed to greater internal furnace pressures. The '**Flame Armour+**' product was installed into timber stud partition servery hatch, with a stainless steel (Type 304) countertop, this represented a 'typical' servery hatch configuration and was the most like-for-like real world application which the manufacturer could test.

STRUCTURAL RECOMMENDATIONS

SSS INDUSTRIAL DOORS

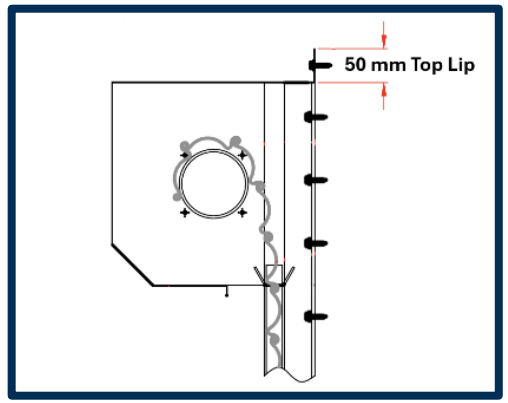
As per the manufacturers Extended Application Report (No. 416673), the Flame Armour Fire Resistant Roller Shutter is covered for installations to a ‘rigid’ supporting construction (i.e. Masonry/Concrete wall) or a ‘flexible’ supporting construction (i.e. Timber Stud Partition). These structural types are defined within BS EN 1363-1: 2020 which is the general requirements standard for fire resistance tests.

It should be noted that the applicable supporting construction must have an equal or greater fire resistance rating than the fire-resistant roller shutter. The substrate must also be capable of supporting the fire-resistant roller shutter for the period of fire resistance required and should not compromise either the integrity of the fire-resistant roller shutter or separating fire-resisting element itself.

During the initial site survey, the surveying engineer is responsible for ensuring that the structural opening is suitable for both fire resistance applications and will also be capable of supporting the imposed load of the roller shutter assembly, for both fire and non-fire conditions. The manufacturer has included the approximate weight of the fire-resistant roller shutter which is stated on the manufacturer’s product drawing.

Prior to proceeding, considerations for these imposed loads by the various components of the fire-resisting roller shutter must be considered. Particularly, for larger applications which specified heavier and thickness critical components (i.e. barrel, axle, endplate, bolts and curtain). To manufacture a compliant fire resistance roller shutter, which is covered within the scope of the Certificate of Constancy of Performance (CoCoP), the manufacturer must use the critical components specified within Extended Application Report for the dimensional requirements, fire-rating and substrate specified upon initial enquiry.

The permitted opening sizes and component specifications are stated within WF Extended Application Report No. 416673. This document includes tables which detail the critical components required to meet the specifications of the initial enquiry. These calculations have been undertaken in accordance with Annex B of EN 15269-10: 2011. The manufacturer must adhere to these specifications in order to manufacturer a fire resistance roller shutter assembly which is within the scope of certification. Any deviation from the tested specification(s), must be covered within the Extended Application report.



As shown in this diagram, the Flame Armour fire resistant roller shutters canopy (hood) includes a 50 mm top lip above the shutters headbox. This lip incorporates the fixings for the canopy and is a critical aspect of the installation process. It is recommended by the manufacturer that the installer ensures sufficient clearance is provided to ensure that the 50 mm top lip can be installed without being impeded. Additional fixing points within timber stud partition must be taken into consideration. Alternative canopy shapes are permitted as per rule F.1.8 of EN 15269-10, please contact the manufacturer for further details.

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STRUCTURAL RECOMMENDATIONS

As detailed within **Figure C.1 of EN 15269-10**, the example given for the general arrangement of the fire-resistant roller shutter shows the fire shutter installed at full height, with the bottom rail situated at the notional floor level. Therefore, the manufacturer recommends that all standard '**FLAME ARMOUR**' fire shutters are installed at **finished floor level (FFL)**.

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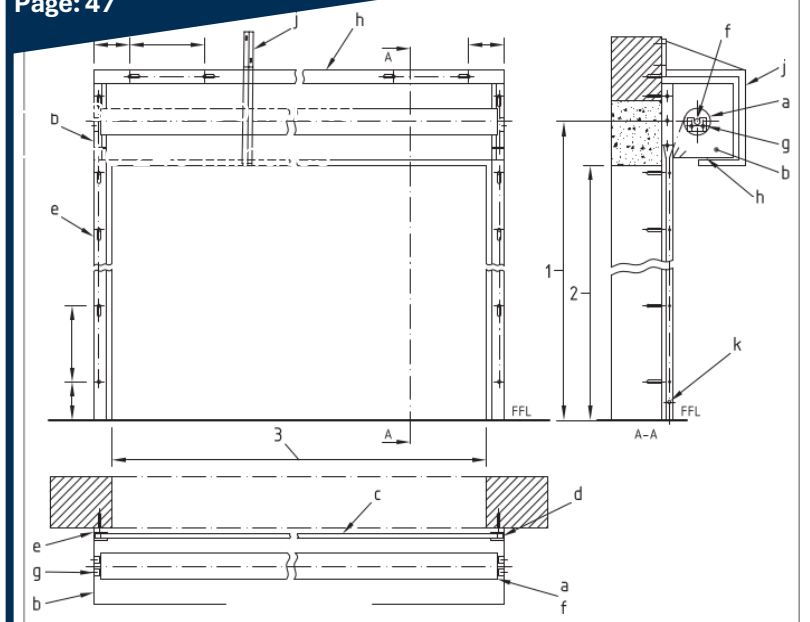
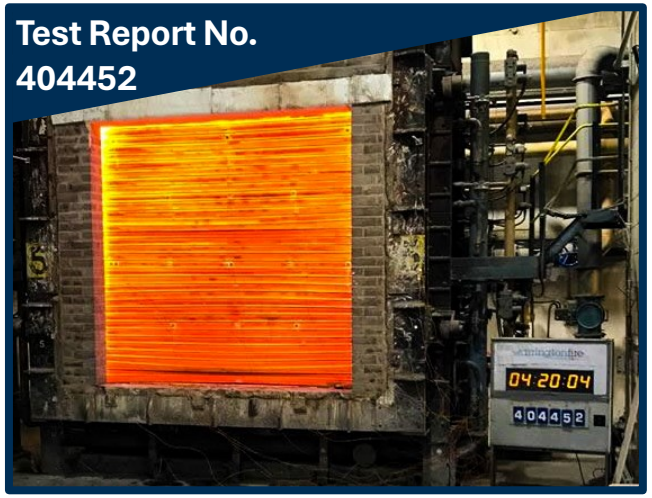


Key

a barrel
b end plate/bracket
c curtain
d guide
e guide fixing angle
f shaft
g shaft cup/support
h coil casing/hood
j barrel/casing support bracket
k bottom rail

Figure C.1 - Example of a general arrangement of steel rolling shutter assembly

Test Report No. 404452



Test Report No. 429933

The latest industry guidance for fire-resistant roller shutters which are installed into a servery hatch / countertop configuration is outside the scope of the Extended Application standard **BS EN 15269-10: 2011**. As a result, any installation company who purchases and installs fire-resistant roller shutters into this type of configuration are liable for the product being installed within a non-tested configuration. Ultimately, liability is on the installer to undertake due diligence prior to proceeding and ensuring that the product they purchase is fit for purpose.

As servery hatch / countertop configurations are not permitted within the **Extended Application** (**ExAp**) scope, if an installation company were to proceed with the specifying and installation of the product to this type of aperture, then the product would be outside the scope of the Construction Product Regulations and cannot be CE and/or UKCA marked accordingly.

It is the **manufacturers responsibility** to ensure that their product is installed to finish floor level (FFL), unless they hold direct test evidence for a 'servery hatch / countertop' configuration. As **this type of application is not permitted** within the **standard BS EN 15269-10: 2011**.

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STRUCTURAL RECOMMENDATIONS

SSS INDUSTRIAL DOORS

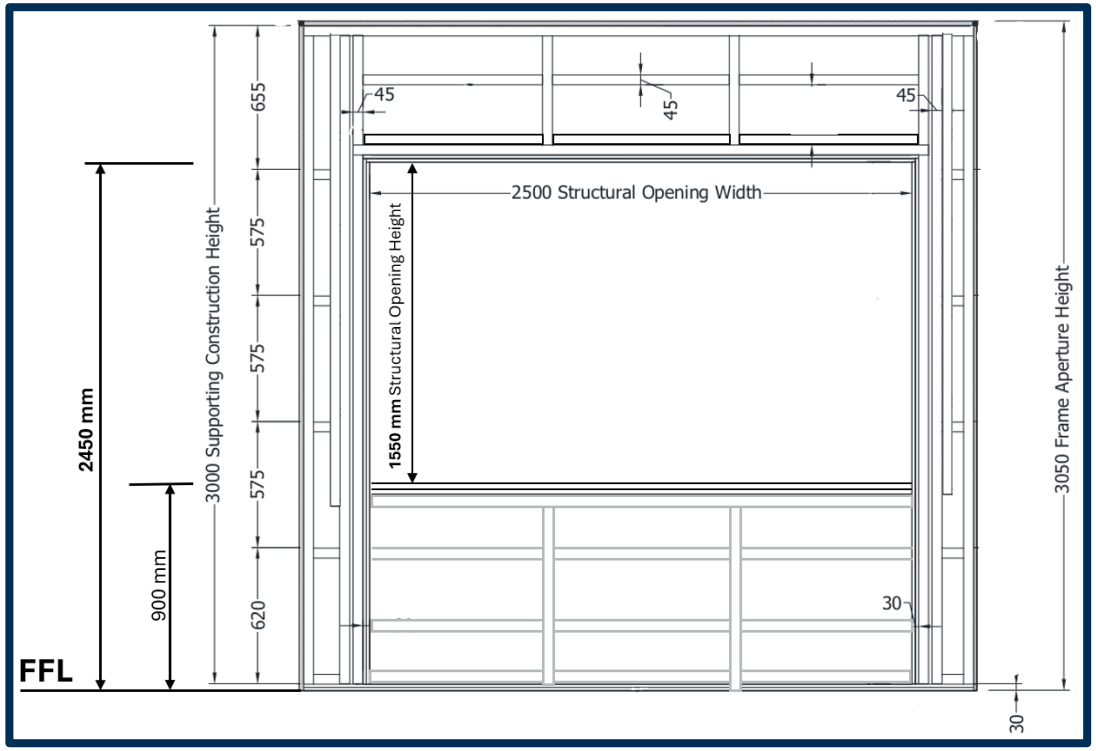
SSS Industrial Doors Ltd have designed a new and enhanced fire-resistant roller shutter which is referenced as the '**FLAME ARMOUR+**' product range. This product has been tested with the bottom rail situated at a higher elevation than finished floor level, therefore subjecting it to greater furnace pressures and more onerous conditions. **WF Test Report No. 552862** is direct test evidence which supports the installation of a fire-resistant roller shutter installed within a servery hatch application.

The '**FLAME ARMOUR+'** product is <u>solely</u> for servery hatch configurations and has direct test evidence which supports this application.

Below is the structural design of the timber stud partition 'servery hatch', which includes the 900 mm partition wall. The manufacturer recommends that the structural opening be identical to the tested specification, including the use of double fire-rate British Gypsum Fireline plasterboard of 15 mm

Tested Construction Details:

- ☑ C16 Timber of 94 mm x 44 mm
- ☑ British Gypsum Fireline Plasterboard of 15 mm
- ☑ Rockwool 'Prorox SL 960' mineral wool insulation core



Due to testing constraints of the laboratory furnace frame, it is not possible to test an aperture dimension which exceeds 3050 mm x 3050 mm. The wall shown was 900 mm from finished floor level.

FLAME ARMOUR
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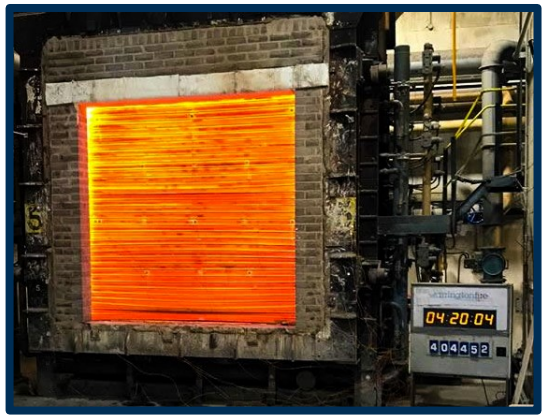
STRUCTURAL RECOMMENDATIONS

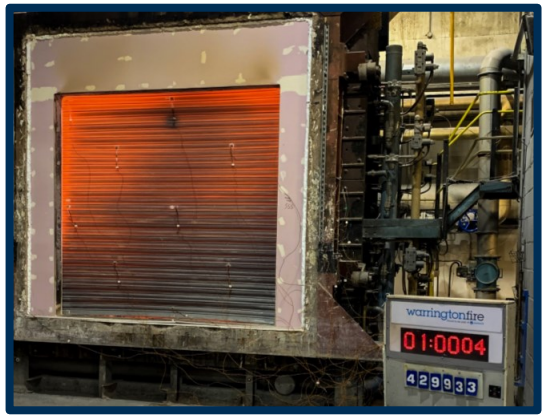
SSS INDUSTRIAL DOORS

The manufacturers Extended Application Report (WF Report No. 416673) states the following supporting construction and clear opening dimensions of covered under the Certificate of Constancy of Performance.



Supporting Construction Type:	Masonry, Concrete or Protected Structural Steel
Acceptable for up to:	240 minutes (E240) Integrity performance
Maximum Applicable Dimensions:	
E60 Integrity Performance:	10000 mm clear opening width x 7000 mm clear opening height
E120 Integrity Performance:	10000 mm clear opening width x 6300 mm clear opening height
E240 Integrity Performance:	8000 mm clear opening width x 3600 mm clear opening height

Additional Note: *It is possible to install into a standard rigid supporting construction, as tested within WF No. 404452, or to install into a 'Protected Structural steelwork' subject to specified conditions referenced within Section J.2 of the BS EN 15269-10.*



Supporting Construction Type:	Timber Stud Partition
Acceptable for up to:	90 minutes (E90) Integrity performance
Maximum Applicable Dimensions:	
E60 Integrity Performance:	7000 mm clear opening width x 7000 mm clear opening height
E90 Integrity Performance:	7000 mm clear opening width x 7000 mm clear opening height

Additional Note: *The tested supporting construction within WF Test Report No. 429933/R included C16 Timber studs with a sectional size of 100 mm wide x 45 mm deep, cladded with two layers of Gypsum GTEC Fireboard of 15 mm thickness. The manufacturer recommends that if the Flame Armour fire shutter is installed into a timber stud partition, then the same thickness and quantity of layers of fire boarding must be utilised.*

The Flame Armour fire resistant roller shutter **cannot be installed** into the following supporting constructions:

- Standard (non-fire rated) plasterboard
- Insulated panel walls
- Metal stud partition walls
- Plastic lined wall
- Whitewall™ partitions
- 'Unprotected' structural steel sections

FLAME ARMOUR
FIRE-RESISTANT ROLLER SHUTTERS

PROTECTED STRUCTURAL STEEL

SSS INDUSTRIAL DOORS

As detailed within the standard BS EN 15269: 2011, the '*Extended application of test results for fire resistance and/or smoke control door, shutter and openable window assemblies including their elements of building hardware: Part 10, Fire resistance of steel rolling shutter assemblies',* in conjunction with the manufacturers Extended Application Report (WF Report No. 416673), subject to conditions outlined below, it is possible to permit the installation of the fire resistant roller shutter into a protected structural steel supporting construction.

To satisfy the requirements for the installation to a protected structural steel supporting construction, which is a variation from the original tested design, the applicable **rule J.2.1 of EN 15269-10** must be satisfied in its entirety. To ensure that compliance is achieved, the involvement of a specialist (Passive Fire Protection) structural engineer and steelworks manufacturer is required.

J.2 Modified Supporting Construction		
J.2.1 Change from standard supporting construction to protected structural steel supporting construction	Possible providing the following applies: a) Structural steel section factor, A/V must be less than 230m^{-1}. Section factor to be calculated assuming section is exposed to fire on all four sides. The section factor shall be calculated as described in EN 13381-4 and EN 13381-8. This rule applies to both the vertical and the horizontal steel sections of the support frame. b) Fire protection system must have been shown by test to EN 13381 to maintain the steel temperature 400°C or less to retain strength and minimise the effects of expansion in the steel section. c) The fixings securing the door to the structural steel shall be in accordance with the appended tables and must be fabricated from steel and designed not to reduce the fire performance of the steelwork fire protection system in ambient conditions or in fire conditions.	Possible to install into standard rigid supporting construction (as tested) or to install into protected structural steelwork subject to specified conditions. Also possible to install into timber stud wall for up to E90 only, as tested under WF No. 429933

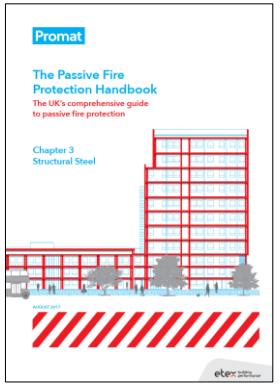
PROTECTED STRUCTURAL STEEL

UNPROTECTED STRUCTURAL STEEL

The manufacturer of the structural steel will be able to provide the applicable test evidence for their product with information regarding the necessary Fire Protection system (e.g. fire-resistance boards, cementitious or intumescent sprays, etc) required to satisfy the criteria above. These fire protection systems must be tested in accordance either **EN 13381: Part 4 or Part 8**.

The manufacturer of the '**FLAME ARMOUR**' product range cannot be held accountable or liable for installations which are outside the permitted scope. It is highly recommended that the installer check and verify the supporting construction prior to proceeding with the installation of the fire-resistant roller shutter product.

If an installer, building contractor or onsite fire officer require further information regarding structural steel and how it can be protected to ensure that the above Extended Application Rule (J.2.1) is satisfied completely, documentation such as 'Chapter 3 – Structural Steel' supplied by Promat can be used to calculate the sectional factor and required fire-resistant protective system.



DIRECTION OF EXPOSURE

As specified within the test standard **BS EN 1634-1:2014 + A1: 2018, Section 13.4.2**, the type of doorset and direction of exposure can permit the scope for the opposite orientation of exposure (subject to conditions).

As detailed within **Table 2** of this section, for **roller shutter assemblies**, the test standard states that if the *'barrel and supporting components fixed on the face of the supporting wall on the fire side'* (i.e. mounted on the fire side of the furnace wall), then for integrity only performance the opposite orientation of exposure is also covered.

BS EN 1364-1: 2014 + A1: 2018

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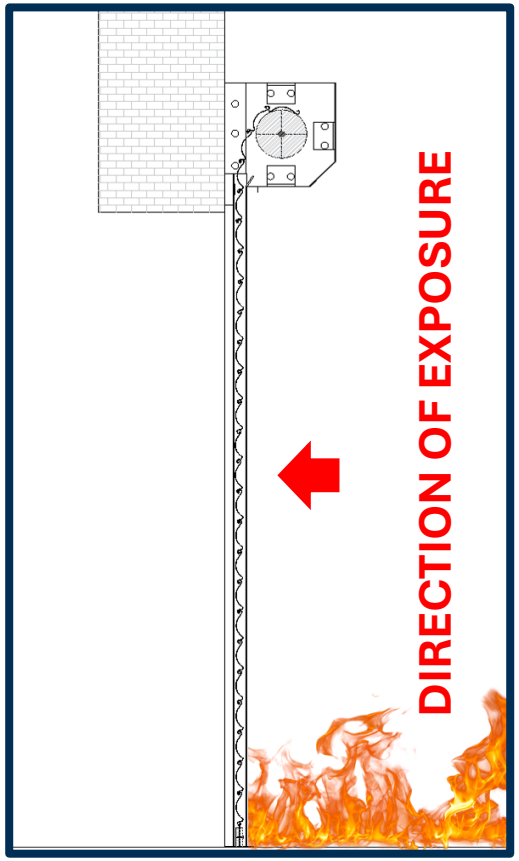
Table 2 — Type of doorset and direction to be tested to cover the opposite direction

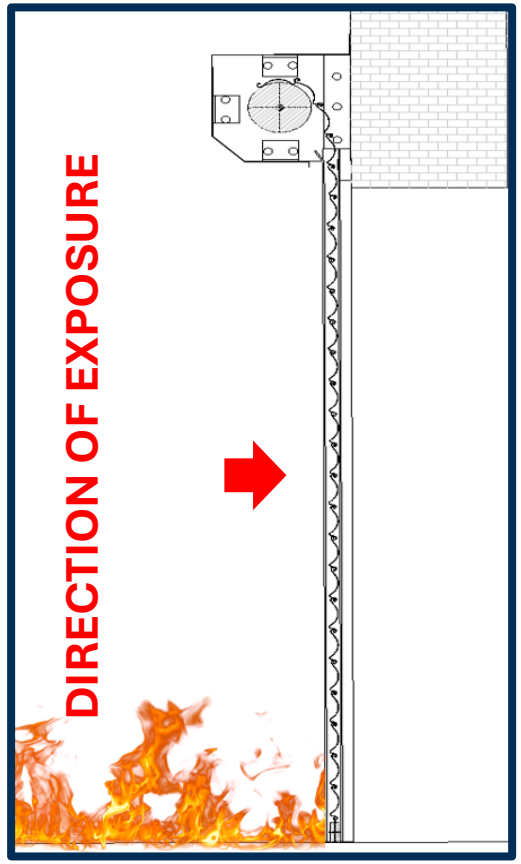
Type of doorset	Direction to be tested to cover opposite direction	Integrity	Insulation	Radiation
Hinged or pivoted, timber leaf, timber frame	Opening into the furnace	yes	yes	yes
Hinged or pivoted, timber leaf, metal frame (no transom)	Opening into the furnace	yes	no	yes
Hinged, metal leaf, metal frame (not pivoted)	Opening away from Furnace	A1 yes a) A1	no	yes
Rolling shutter	Barrel and supporting components fixed on the face of the supporting wall on the fire side	yes	no	no
Sliding/folding	Sliding/folding supporting components fixed on the face of the supporting wall on the fire side	yes	no	no
Operable fabric curtains	Not possible to define a scenario	yes	no	no

a This only applies to doors without insulation in the core and with a movement restrictor at approximately mid-height on the hinge side.

Please refer to the full standard for further information.



AS TESTED



PERMITTED

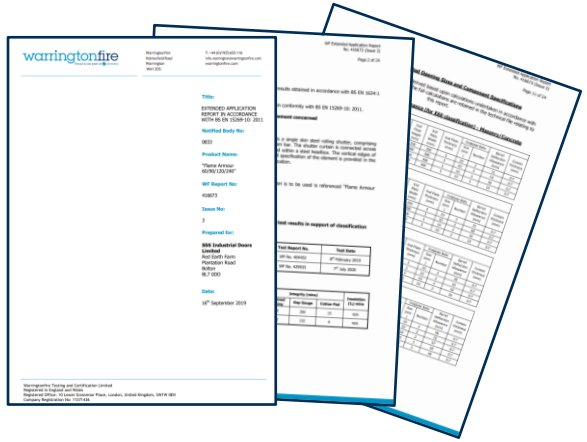
FLAME ARMOUR
FIRE-RESISTANT ROLLER SHUTTERS

TIMBER STUD PARTITION - GUIDANCE

The installer must ensure that the supporting construction is suitable for the installation of the fire-resistant roller shutter. In some cases, this will require the liaising with a building contractor onsite. The installer must ensure that the fixings are central when installed into the vertical and horizontal timber studs.

As per the drawing extracted from WF Test Report No. 429933, which has the horizontal fixing point highlighted in yellow for ease of reference, it is critical that the fixing which are located at the top of the fire-resistant roller shutter (i.e. canopy hood fixings) are installed in the middle of this timber stud. The location of this timber is determined by the size of the endplates, please refer to the technical drawing which are supplied prior to confirmation of order.

NOTE – The size of the endplates is determined by the dimensions of the structural opening as stated within the Extended Application Report.



It is **imperative** that the installer **uses the fixings provided** by the manufacturer, as these are specified in the Extended Application Report. Failure to use the fixing provided, results in a non-compliant product being installed.

WF Test Report No. 429933/R
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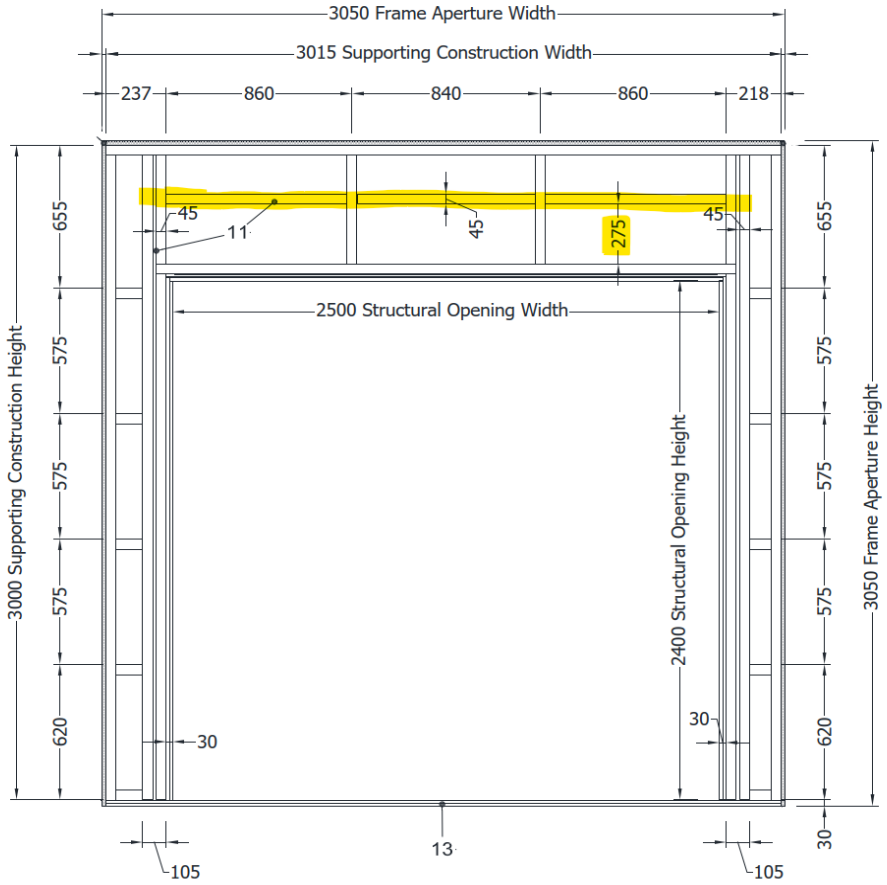
Figure 2 – Elevation of Supporting Construction at Unexposed Face



ELEVATION OF SUPPORTING CONSTRUCTION AT UNEXPOSED FACE
WITH PLASTERBOARD FACINGS REMOVED FOR CLARITY