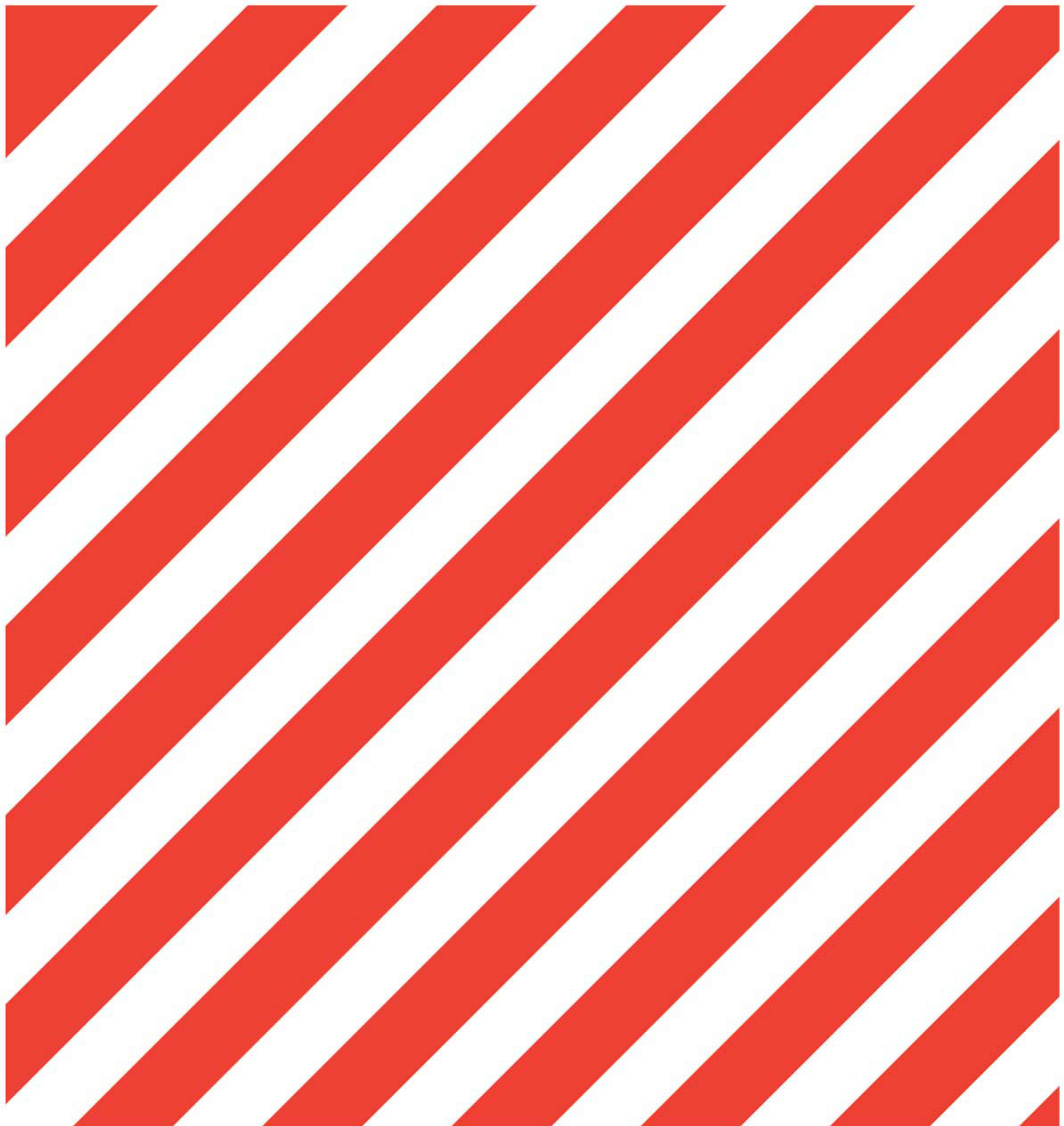


Uniclass L5:P2:N32	EPIC E:X2:Y421
CI/SfB	Rf9 (K2)+(K3)

December 2003

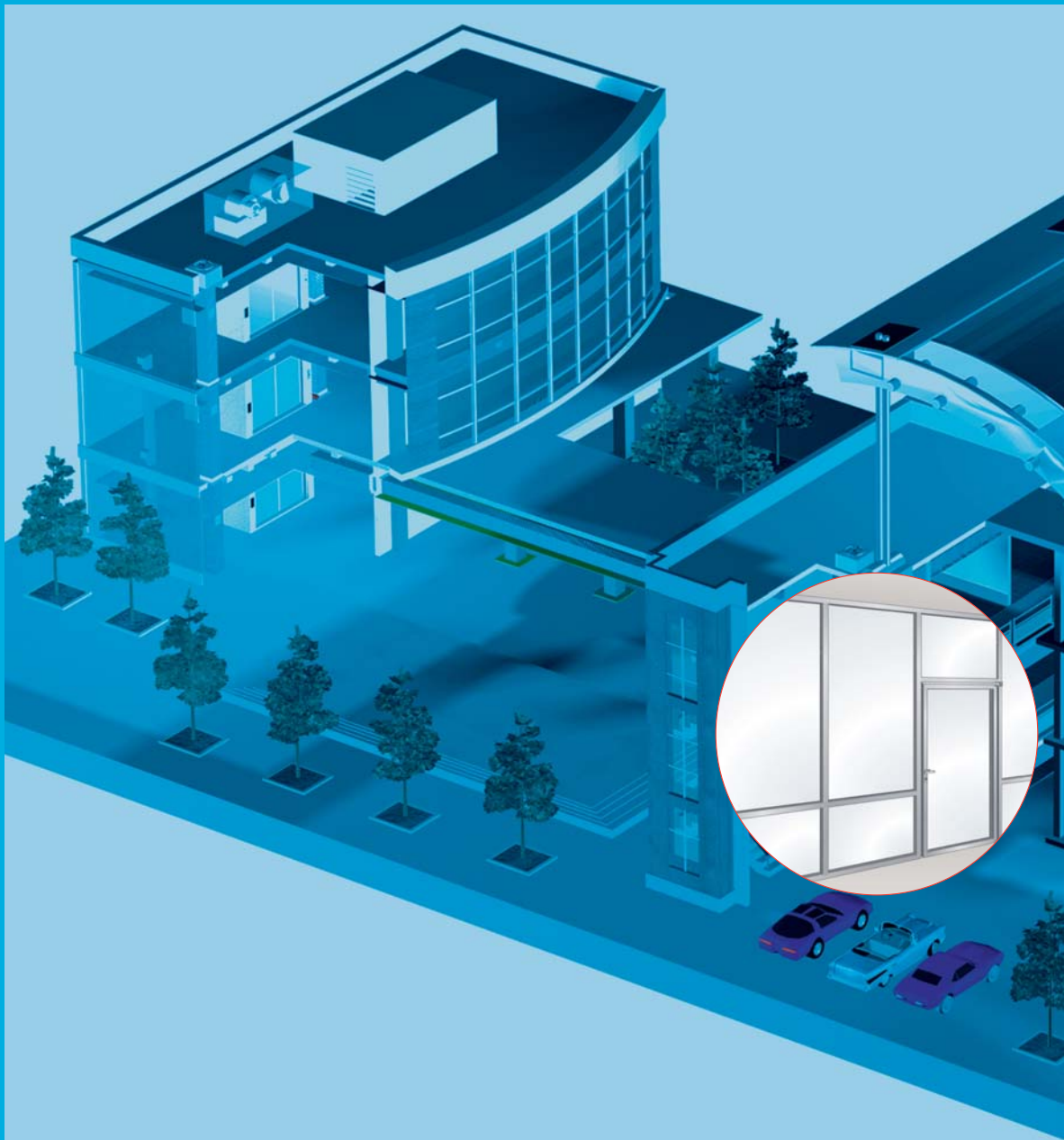


The Passive Fire Protection Handbook



FIRE RESISTANT GLAZING SYSTEMS

8



Traditionally glass has been the last material architects think of when specifying fire barriers. New technologies are turning this traditional thinking on its head.

Glass is now firmly established throughout the world as a fire protection material. Advances in glass and the manufacturing technology of glass mean that today's range of fire resistant glazing offers creative options for the designer/specifier.

This document provides information on the Promat fire resistant glazing systems, which offer technical, economical and aesthetic solutions to glazing problems. For Promat, the aesthetics of glazing systems go hand in hand with the vital aspect of fire safety offered by passive fire protection systems.

With our Promat glazing systems we have developed a wide range of systems for fire resistant applications of up to 120 minutes ratings, including FD30 and FD60 doors, which provide both integrity and insulation when exposed to fire. Typical examples include glazed screens without vertical or horizontal framing and all-glass doors.

Our commitment to the philosophy of providing the optimum system performance is shown by our development of glazing systems that fulfil the highest safety classifications for impact resistance. Promat glazing systems meet the approval criteria of all the relevant standards applicable to fire resistant glazed constructions.

Design Considerations

1. Manifestation

Large areas of transparent glazing used to subdivide a building may not be immediately apparent, particularly under certain lighting conditions. People moving around the building may not be aware of the glazing and may collide with it. The glazed areas referred to include large uninterrupted areas of transparent glazing which form, or are part of, the walls and doors of shops, showrooms, offices, factories, public and other non-domestic buildings. Permanent manifestation is only necessary when other means of indicating the presence of the glazing are not present. When manifestation is required it should be of a sufficient size to be immediately obvious and should be positioned between 600mm and 1500mm above floor level and preferably be permanent and durable.

2. Impact Resistance

Glass and plastic materials which are intended for use as safety glazing materials in critical locations in buildings where human impact can occur should be classified according to their performance when subjected to a series of pendulum tests.

The impact test utilises a lead shot-filled leather bag weighing 45kg dropped from different heights. Details of the impact test are given in BS 6206: 1981 'Specification for Impact Performance Requirements for Flat Safety Glass and Safety Plastics for use in Buildings'. There are three safety glazing classifications: A (the highest), B, and C (the lowest). Glasses meeting these requirements and intended for use as safety glasses must be permanently marked as conforming to BS 6206.

Critical Locations

These are defined either directly or in Building Regulations. These detail areas in which the use of glazing systems will be subject to additional performance requirements in terms of impact and bending resistance. For example, the use of glass to encase escape stairways etc. Most building regulations are only concerned with glazing which forms part of the building structure whereas BS 6262: Part 4: 1994 sets standards for other locations, such as shower screens, shower cubicles and mirror glazing for cupboards and wardrobes.

The following locations should be regarded as critical:

- Between finished floor level and 800mm above
- Between finished floor level and 1500mm above if in doors or side panels close to either edge of a door

Glazing in critical situations may be protected by a suitably designed protective screen in which case the glazing does not need to meet the defined requirements. The screening should be designed in such a way that:

- It is independent of the glazing
- It will prevent a sphere of 75mm diameter from touching the glass
- If 900mm or more in length, it is sufficiently robust to sustain at least a centrally applied force of 1350N (1100N if less than 900mm in length) without:
 - Fracturing
 - Deflecting so as to impact the glass
 - Permanently distorting
 - Being displaced

If the screening system is multi-railed, each rail should satisfy this recommendation. The screen should not be climbable. Please consult Promat Technical Services Department for further information.

INSTALLING GLAZING SYSTEMS

Below Suspended Ceilings / Above Raised Access Floors

The details in the following pages are applicable for use where the frames are fixed to a solid substrate, however, in some instances, the glass system will be required to be incorporated in the space between a suspended ceiling and/or a raised floor system. In these instances, the following MUST be considered as applicable to all glazing systems.

If the ceiling lining is fire rated to an equivalent time period to the glass, then it is possible to install the frame beneath the ceiling lining. However, in all cases it is not acceptable that the screen framing is stopped at the ceiling level. The framing members must continue above the ceiling lining and be fixed back to a solid substrate, i.e. the concrete slab forming the next floor level. This is to ensure that the weight of the glazed screen does not adversely affect the fire performance of the ceiling. Consideration should also be given as to whether or not the ceiling lining is actually strong enough to provide a lateral restraint to the glazed screen. If the suspended ceiling is not a fire rated construction, it is possible, above the ceiling lining, to incorporate a substantial fire protection partition to support the top of the glass screen.

Attention must also be paid to glazed screens located on a raised access floor. Under fire conditions, the flooring will gradually char and burn away. In this case the floor will not have sufficient residual strength to support the weight of the glazed screen. In addition, if the floor does burn through, the fire can then pass beneath the glazed screen and effectively bypass the compartmentation, therefore the framing in these areas should also go down to the main substrate and a cavity barrier of SUPALUX® should be installed in this area. It should be noted that the use of a fire rated raised access floor does not automatically mean the underfloor area can be ignored. Checks should be made with the floor system manufacturer to ensure that at the end of the required fire resistance period, the floor will retain sufficient residual strength to continue to support the glazed screen. If advised that this will not be the case, or if any uncertainty prevails, then you must install the framing in such a manner that the load is supported from the concrete slab below the raised floor.

Care must be taken that no additional load is imposed on glazed systems from loading of the substrate, e.g. deflection of the concrete slab, if this occurrence is likely then a movement joint must be incorporated within the construction.



FIRE RESISTANT INSULATED GLASS – PROMAT® SYSTEMGLAS

Promat® SYSTEMGLAS has been especially developed to enable architects and designers to indulge in aesthetically pleasing constructions whilst ensuring the vital aspect of fire safety is completely fulfilled.

Exciting design concepts are now possible with the new Promat® SYSTEMGLAS. The system offers superior passive fire protection quality using innovative methods of construction. The Promat® SYSTEMGLAS construction provides insulation across the glass joints without the need for insulating cover strips. This performance is only possible with the new, specially developed Promat® SYSTEMGLAS.

With our patented Promat® SYSTEMGLAS constructions, we have developed a wide range of fire resistant systems, including FD30 and FD60 doorsets. All our designs will provide both integrity and insulation in accordance with the criterion of the BS 476: Part 22: 1987.

Each construction is particularly innovative, typical examples include glazed screens without any framing at any joints, and all-glass doors.

Promat® SYSTEMGLAS is available in many variations, including several tints and with different coatings, etchings etc.

You will find systems in this handbook with the following 5 key advantages:

1. Joints in the Promat® SYSTEMGLAS all-glass screen are simply formed with a bead of silicone mastic. No transoms or Mullions are required.
2. The perimeter frame of the screen uses slender sections only 50mm wide and 20mm deep.
3. Promat® SYSTEMGLAS fire doors (double leaf or single leaf), can be fixed either within a glazed screen or a masonry wall construction, and can also be used as smoke rated (FD30S) doors.
4. Promat® SYSTEMGLAS doors can be installed without the need for lever handles.
5. The use of standard steel hollow sections and accessories makes each Promat system very economical in construction.

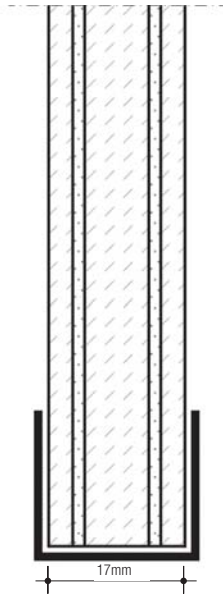
Table 1: Comparison of Promat® SYSTEMGLAS

	Promat® SYSTEMGLAS 30			Promat® SYSTEMGLAS 60			Promat® SYSTEMGLAS 90		
	30 minutes integrity and insulation			60 minutes integrity and insulation			90 minutes integrity and insulation		
Fire resistance	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
Glass type	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
Areas of use	Internal and protected from UV	Internal but exposed to UV	Double glazed	Internal and protected from UV	Internal but exposed to UV	Double glazed	Internal and protected from UV	Internal but exposed to UV	Double glazed
Thermal transmittance W/m²K	5.2	5.0	2.8	5.1	5.0	2.7	4.9	4.7	2.6
Sound reduction (Rw) dB	39	41	42	41	42	44	43	44	45
Safety rating (BS 6206)	Class B	Class A	Class A	Class A	Class A	Class A	Class A	Class A	Class A
Butt joint application (NF)	Yes	Yes	No	Yes	Yes	No	No	No	No
Maximum tested pane size mm	2700 x 1400			2700 x 1400			2300 x 1400		
Size tolerance mm	+2 to -2			+2 to -2			+2 to -2		
Glass structure	Laminate	Laminate	Double glazed	Laminate	Laminate	Double glazed	Laminate	Laminate	Double glazed
Thickness mm	17	21	35	25	29	43	37	41	58
Alternative option*	–	–	–	21	25	–	–	–	–
Weight kg/m²	40	48	64	60	68	83	80	88	103
Light transmittance (clear) ca%	85	83	74	83	82	73	80	78	70
Colour options	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
	–	Bronze	Bronze	–	Bronze	Bronze	–	Bronze	Bronze
	–	Grey	Grey	–	Grey	Grey	–	Grey	Grey
	–	Green	Green	–	Green	Green	–	Green	Green
	–	Patterned	Patterned	–	Patterned	Patterned	–	Patterned	Patterned
	–	Opal	Opal	–	Opal	Opal	–	Opal	Opal
	–	Reflective	Reflective	–	Reflective	Reflective	–	Reflective	Reflective
	–	–	Low-E	–	–	Low-E	–	–	Low-E
Surface finish	On application			On application			On application		

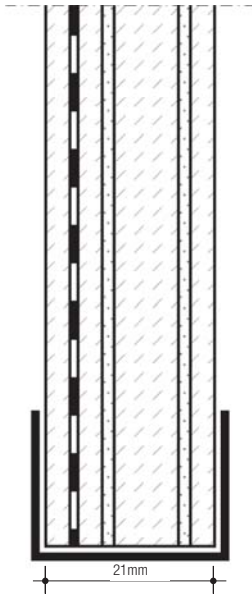
* For use in door leaf construction

NOTE: If higher sound reduction is required, please consult Promat Technical Services Department for further options. The properties in this table are mean values given for guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat Technical Services Department.

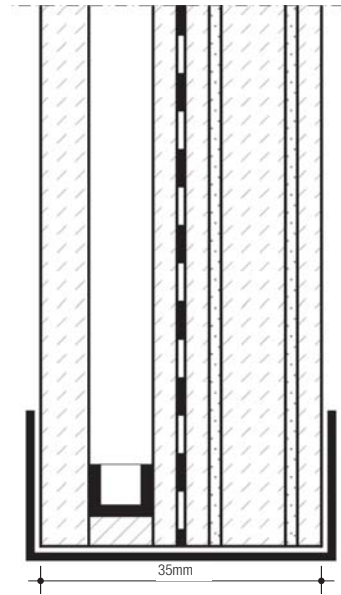
PROFILE OF PROMAT® SYSTEMGLAS 30



Type 1 – Standard glass.

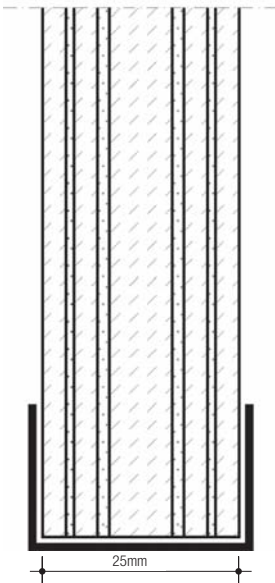


Type 2 – With UV protective layer.

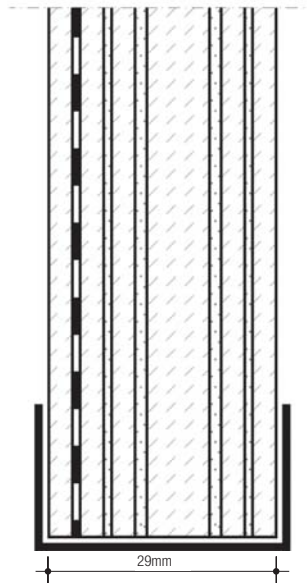


Type 3 – Double glazed unit with protective interlayer.

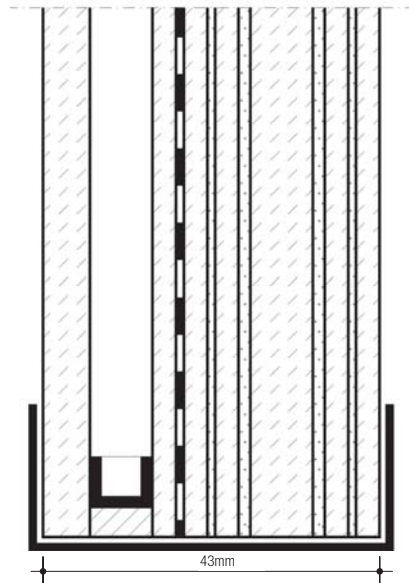
PROFILE OF PROMAT® SYSTEMGLAS 60



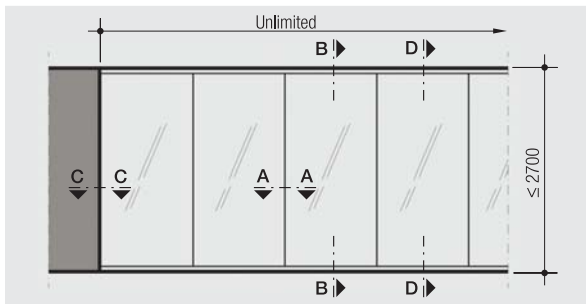
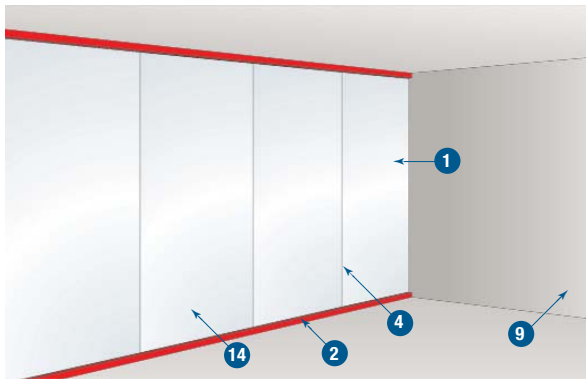
Type 1 – Standard glass.



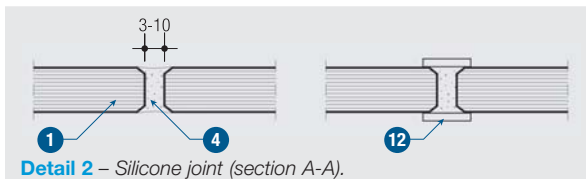
Type 2 – With UV protective layer.



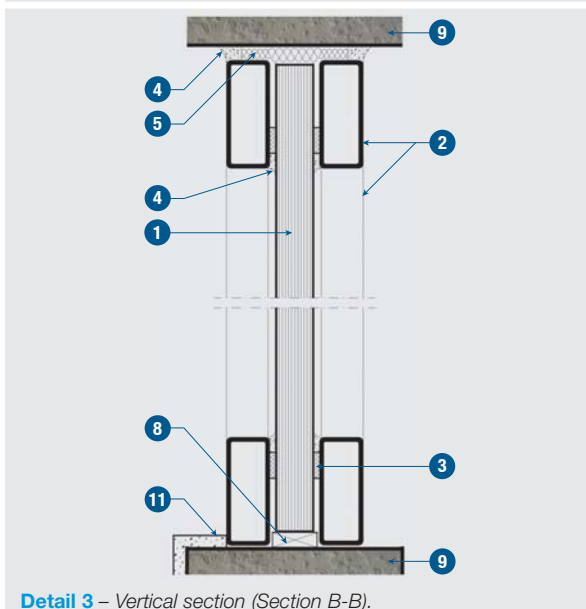
Type 3 – Double glazed unit with protective interlayer.



Detail 1 – Elevation (vertical & horizontal unframed joints).



Detail 2 – Silicone joint (section A-A).



Detail 3 – Vertical section (Section B-B).

NOTE: Under no circumstances should the edging tape be removed from the glass. It is there to prevent ingress of moisture or acetate from the silicone sealant entering the intumescent layer and causing discolouration.

PROMAT® SYSTEMGLAS SCREENS – NF1 SYSTEM

All Glass Screens with Vertical Joints

This unique design concept for a fire rated glass wall is a revolutionary technical breakthrough in the passive fire protection industry. Exciting design concepts are now possible with new Promat® SYSTEMGLAS. The system offers superior passive fire protection quality using innovative methods of construction. The Promat® SYSTEMGLAS construction provides insulation across the glass joints without the need for insulating cover strips. This performance is only possible with the new, specially developed Promat® SYSTEMGLAS.

Promat® SYSTEMGLAS is available in many variations, which can be used in many applications as insulating laminated glass. It is available in several tints and with different coatings.

TECHNICAL DATA

30 and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, chamfered edges, 17mm thick maximum pane size 1400mm x 2700mm.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, chamfered edges, 25mm thick maximum pane size 1400mm x 2700mm.

2. Steel hollow sections

For overall glazed element up to 3m high:

minimum 50mm x 20mm x 2mm thick.

For overall glazed element over 3m high:

minimum 60mm x 25mm x 2mm thick.

3. Self adhesive glazing tape, 10mm x 3mm.

4. Promat® SYSTEMGLAS silicone mastic.

5. Mineral wool, 15mm thick compressed.

6. SUPALUX® 50mm x 25mm thick fixed using 50mm screws at nominal 200mm centres, or 50mm x 10mm x 1.5mm steel wire staples at nominal 100mm centres.

7. SUPALUX® strips, minimum 20mm thick.

8. SUPALUX® setting blocks.

9. Solid wall, floor or ceiling with a fire-resistance equal to or greater than that of the glazing system.

10. Masonry fixing, expansion bolt or similar at nominal 500mm centres.

11. Plaster or cement rendering.

12. Optional covering profiles made of stainless steel, aluminium, wood or plastic profiles.

13. Steel angle to cover raw glass edge and to provide additional protection against impact.

14. Fire rating marked on Promat® SYSTEMGLAS.

- 15. Bedding mortar where required for uneven substrate.
- 16. Fire rated partition.
- 17. PROMASEAL® PL strip.
- 18. Lightweight partition framing.

Details 4 & 5 – Wall and floor connections

Where a hidden perimeter frame is required in order to achieve the aesthetics, it is possible to dispense with the steel hollow profiles and in their place use strips of SUPALUX®; section C-C and D-D to the right show the construction using SUPALUX® strips (7) of 20mm and 25mm in thickness. The SUPALUX® beads, item (6), can be either screwed (using 50mm screws at nominal 300mm centres) or stapled (using 50mm staples at nominal 100mm centres) to the main substrate boarding. Where connecting to a central masonry pillar they should be of a width equal to the masonry construction. The masonry or concrete substrate should be of sufficient mass to ensure they are inherently fire resistant themselves, to a level equivalent to the glass construction. Please note that the SUPALUX® can be decorated or plaster skimmed after installation. Recommendations for the finishing of SUPALUX® are contained in the relevant section of this handbook.

In certain circumstances it is possible to simply insert the Promat® SYSTEMGLAS within a groove cut into the substrate and adhere into position using the Promat® SYSTEMGLAS silicone mastic.

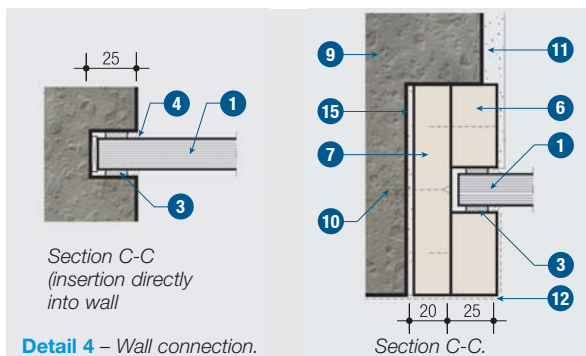
Detail 6 – Alternative wall connection to lightweight partition

The perimeter frames are fixed back to a substrate that is solid enough to support and brace the glass construction. This substrate must have a fire rating that is at least equal to that provided by the glass construction. The substrate can consist of masonry, or lightweight partitions as detailed. The steel hollow sections (2) should be securely fixed back to the framing support (18) of the lightweight partition.

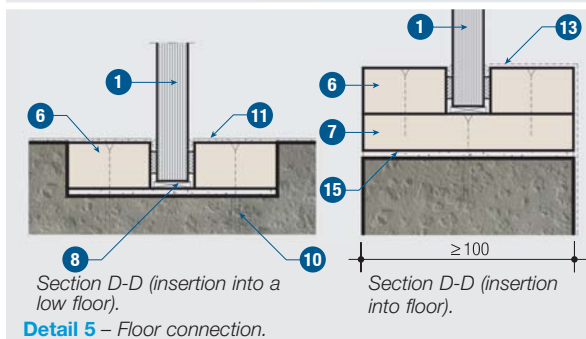
Detail 7 – Corner detail 90° (30 minute rating only)

This idea of using the two sections of glass adhered together with silicone can be taken one step further in order to construct corners without steel framing, as detailed. The corner joints can be constructed, for construction heights up to 2700mm. Detail 7 shows the 90° option, butt jointing square glass together using the silicone sealant. The corners can be at any angle between 90° and 180° but will need a small cover section (13) as shown. This section is necessary to provide impact protection to the corner of the glass and is required to hide the end of the glass. The section can simply be applied with silicone sealant.

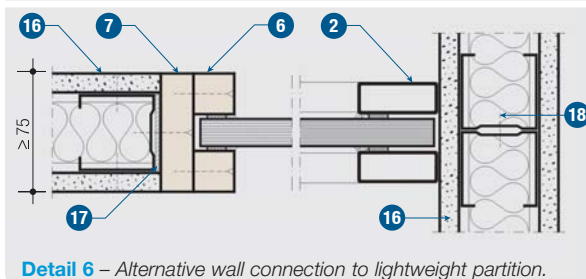
The edges of the glass within the system are sealed with an aluminium tape to protect the edge against ingress of moisture. This tape is not visible when the joint is sealed and finished using cover sections.



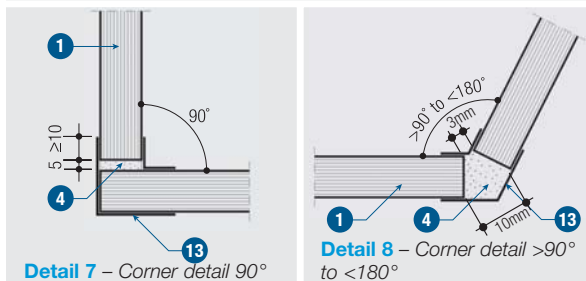
Detail 4 – Wall connection.



Detail 5 – Floor connection.



Detail 6 – Alternative wall connection to lightweight partition.

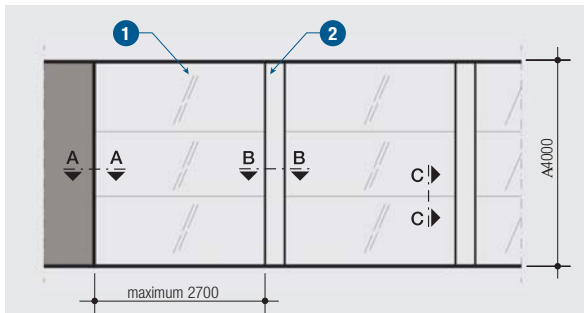
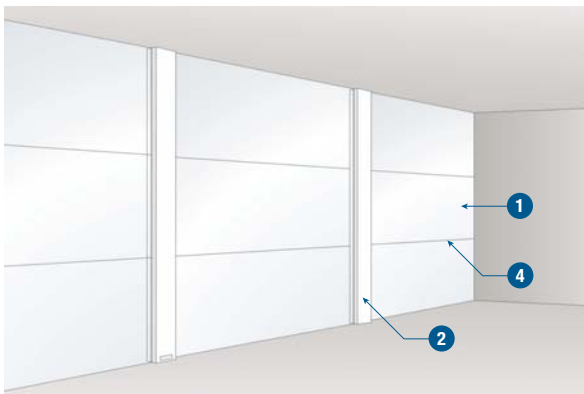


Detail 7 – Corner detail 90°

Detail 8 – Corner detail >90° to <180°

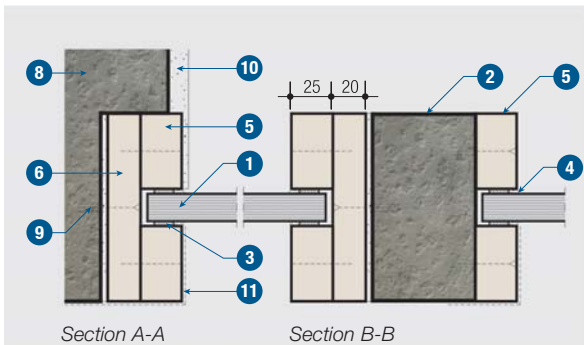
Detail 8 – Corner detail >90° to <180° (30 minute rating only)

For an alternative corner joint, details 7 and 8 are applicable for 30 minutes ratings only. In this system the glass sections are sealed together using PROMASEAL® fire rated translucent silicone sealant. In addition there is a small cover plate over the joint, which should extend 20mm either side of the joint and is fixed into position using the silicone. This cover plate is in position for the purpose of providing a degree of impact resistance to the edges of the glass joint.

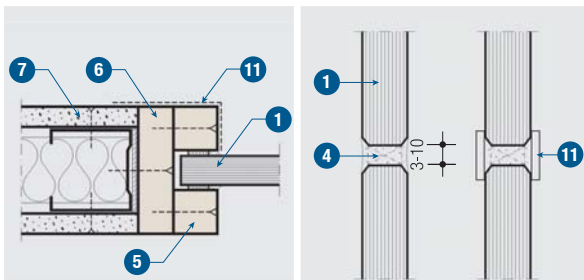


Detail 1 – Elevation (Horizontal unframed joints).

8



Detail 2 – Wall connection and mullion detail.



Detail 3 – Connection to lightweight partition (Section A-A).

Detail 4 – Silicone joint (Section C-C).

PROMAT® SYSTEMGLAS SCREENS – NF2 SYSTEM

All Glass Screens with Horizontal Joints

An alternative method of using the unique butt jointed Promat® SYSTEMGLAS is where the joints between the glass panes are in a horizontal orientation.

Where there exist concrete or masonry columns, the Promat® SYSTEMGLAS can simply be installed between these by use of the methods detailed below. The SUPALUX® beads (5) can be either screwed or stapled to the main substrate boarding. Where connecting to a central masonry pillar (2) the SUPALUX® strips should be of a width equal to the masonry construction. The width of the masonry or concrete pillars should be sufficient to ensure they are inherently fire resistant themselves, to a level equivalent to the glass construction.

TECHNICAL DATA

30 minutes and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, chamfered edges, 17mm thick maximum pane size 1400mm x 2700mm.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, chamfered edges, 25mm thick maximum pane size 1400mm x 2700mm.

2. Concrete or masonry columns with a fire resistance equal or greater than the glass.
3. Self adhesive glazing tape, 10mm x 3mm.
4. Promat® SYSTEMGLAS silicone mastic.
5. SUPALUX®, 50mm x 25mm thick, fixed using 50mm screws at nominal 200mm centres, or 50mm x 10mm x 1.5mm steel wire staples at nominal 100mm centres.
6. SUPALUX® strips, minimum 20mm thick.
7. Fire rated partition.
8. Solid wall, floor ceiling with a fire resistance equal to or more than that of the glazing system.
9. Masonry fixing, expansion bolt or similar at nominal 500mm centres.
10. Plaster or cement rendering.
11. Optional covering profiles made of stainless steel, aluminium, wood or plastic profiles.

PROMAT® SYSTEMGLAS SCREENS – NF3 SYSTEM

All Glass Screens with Horizontal Joints

Where no masonry or concrete columns exist, Promat® SYSTEMGLAS can be installed as below. The total width of the glazed screen is unlimited, the height is restricted to 4000mm, the maximum glass pane size is 2700mm x 1400mm.

The horizontal joints between the glass panes are butt jointed and sealed using Promat® SYSTEMGLAS silicone mastic. The perimeter framing is formed from either steel hollow sections as shown, SUPALUX® strips or steel angles. The vertical mullions are steel hollow sections as shown. Please consult Promat Technical Services Department for further details.

TECHNICAL DATA

30 minutes and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, chamfered edges, 17mm thick maximum pane size 1400mm x 2700mm.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, chamfered edges, 25mm thick maximum pane size 1400mm x 2700mm.

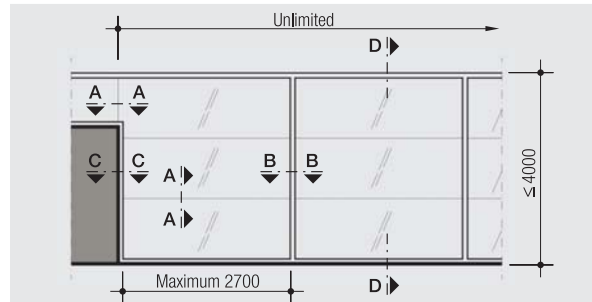
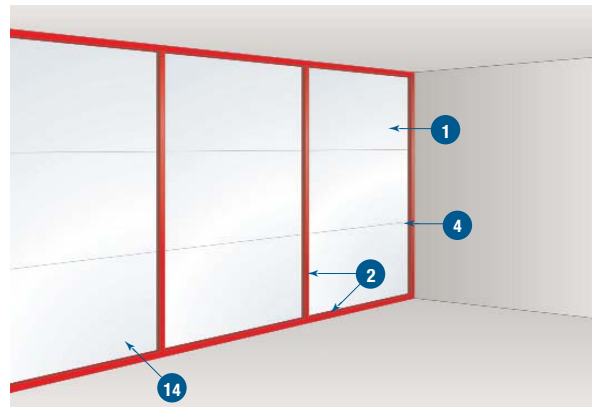
2. Steel hollow sections:

For overall glazed element up to 3m high: minimum 50mm x 20mm x 2mm thick.

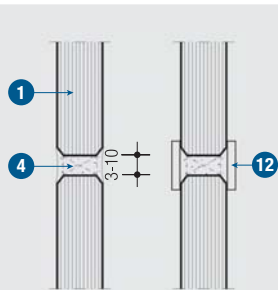
For overall glazed element over 3m high: minimum 60mm x 25mm x 2mm thick.

3. Self adhesive glazing tape, 10mm x 3mm.
4. Promat® SYSTEMGLAS silicone mastic.
5. Mineral wool, 15mm thick compressed.
6. SUPALUX®, 50mm x 25mm thick, fixed using 50mm screws at nominal 200mm centres, or 50mm x 10mm x 1.5mm steel wire staples at nominal 100mm centres.
7. SUPALUX® strips, minimum 20mm thick.
8. SUPALUX® setting blocks, 21mm x 6mm thick, 2 pieces per glass pane at least 100mm from the corner of glass.
9. Solid wall, floor or ceiling with a fire resistance equal to or more than that of the glazing system.
10. Masonry fixing, expansion bolt or similar at nominal 500mm centres.
11. Plaster or cement rendering.
12. Optional covering profiles made of stainless steel, aluminium, wood or plastic profiles.

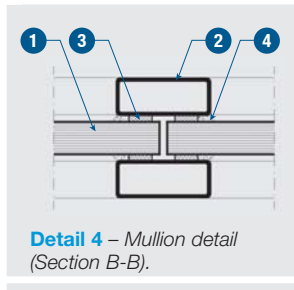
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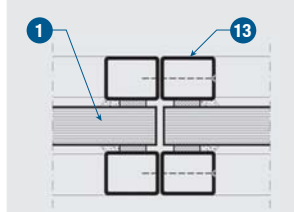
Detail 1 – Elevation (Horizontal unframed joints).



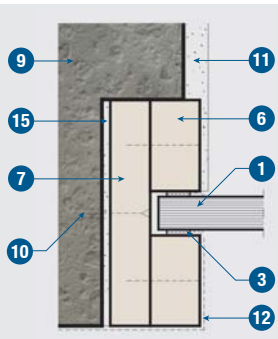
Detail 2 – Silicone joint (section A-A).



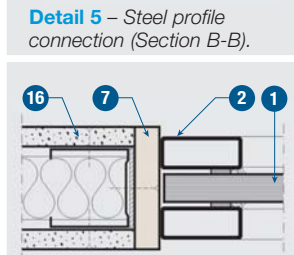
Detail 4 – Mullion detail (Section B-B).



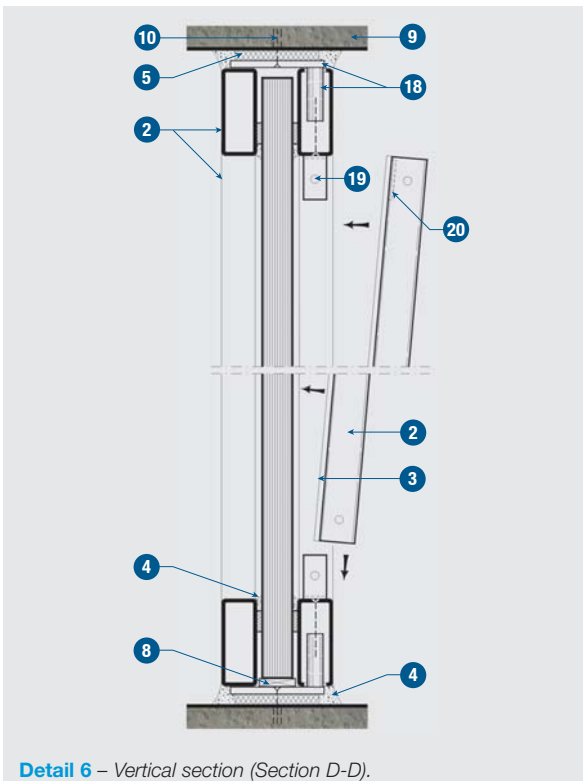
Detail 5 – Steel profile connection (Section B-B).



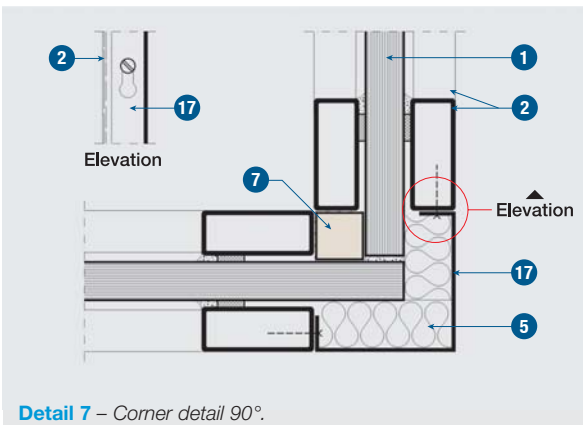
Detail 3 – (a) Wall connection (Section C-C).



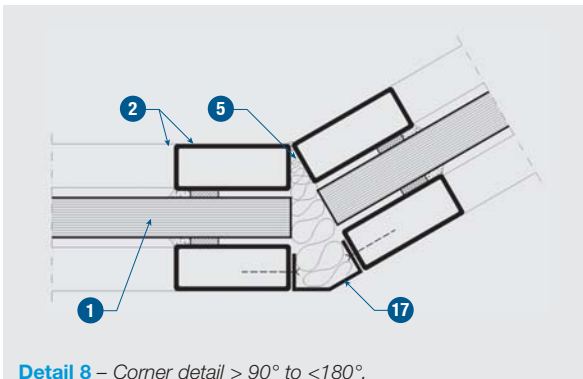
(b) Connection to lightweight partition (Section C-C).



Detail 6 – Vertical section (Section D-D).



Detail 7 – Corner detail 90°.



Detail 8 – Corner detail > 90° to < 180°.

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13. Connecting steel profiles, screwed together:

Minimum 25mm x 20mm x 2mm, maximum 3m height.
Minimum 30mm x 25mm x 2mm, maximum 4m height.

14. Fire rating marked on Promat® SYSTEMGLAS.

15. PROMASEAL® Mortar.

16. Fire rated dry wall.

17. Steel cover profile, fixed to the steel hollow sections using screws at nominal 200mm.

18. Steel plate and threaded dowel welded on steel hollow section (2) to one side of the screen at 655mm centres.

19. Frame fixing bracket of mild steel channel, 25mm x 46mm x 1.5mm thick.

20. Notch cut out to top of hollow section to allow installation around item (19).

Detail 5 – Steel profile connection (Section B-B)

It is feasible for smaller framing sections than these to be produced with welded joints off site and simply secured together using machine screws. The detail shows how two smaller profiles can be joined to make one larger section.

Detail 6 – Vertical section (Section D-D)

This section shows the standard head and floor fixing, with the addition of the vertical mullions required for NF3 screens.

Depicted in the above drawing is a cut out to the back face of the hollow profile (20) which enables the section to slip over the U profile (19). The hollow section is then fixed to the U profile using a machine screw. The horizontal hollow sections forming the transom to the system is fixed to U profiles in a similar manner to the vertical sections.

Details 7 & 8 – Corner details

Corner joints can be constructed using a combination of steel hollow profiles, mineral wool infill and steel cover profiles as depicted below. These corner sections can be at any angle required.

These corner details are applicable for fire resistance in terms of the integrity and insulation criteria of BS 476: Part 22: 1987 for periods up to 60 minutes.

PROMAT® SYSTEMGLAS SCREENS - EF1 SYSTEM

All Glass Screens with Joints Cover Profiles

Promat® SYSTEMGLAS F30 and F60 are new designs for a unique glazing system that provides outstanding benefits to building owners, architects, consultants and contractors. The system uses standard steel hollow sections, replacing costly and difficult to source special glazing components. Fabrication of the system is simple, as the framing can be prefabricated and assembled on site using standard fasteners. A single or double leaf door can be incorporated in the design of the glazed screen.

TECHNICAL DATA

30 minutes and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, 17mm thick maximum pane size 1400mm x 2700mm.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, 21mm thick maximum pane size 1200mm x 2500mm.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, 25mm thick maximum pane size 1400mm x 2700mm.

2. Steel rectangular hollow sections:

Minimum 50mm x 20mm x 2mm, maximum 3m height.
Minimum 60mm x 25mm x 2mm, maximum 4m height.

3. Connecting steel profiles, screwed together:

Minimum 25mm x 20mm x 2mm, maximum 3m height.
Minimum 30mm x 25mm x 2mm, maximum 4m height.

4. Self adhesive glazing tape, 10mm x 3mm.

5. Promat® SYSTEMGLAS silicone mastic.

6. Mineral wool, 15mm thick compressed.

7. Setting blocks of SUPALUX®, 2 pieces per glass pane at least 100mm from the corner of the glass. Additional blocks are required for width of glass over 1400mm.

8. Small steel holding plates, 20mm x 20mm x 1mm with screw.

9. Optional cover made in stainless steel, aluminium or wood.

10. Masonry fixing, expansion bolt or similar at nominal 500mm centres.

11. Solid wall, floor or ceiling with fire resistance equal or greater than the glazed screen.

12. Plaster or cement rendering.

13. SUPALUX® strips (omitted for clarity).

14. Steel channel profile used where allowance for vertical movement of the substrate is required.

15. Mild steel tube with threaded hole through the centre to take M6 machine screw, welded to steel plate 60mm x 30mm x 5mm.

Steel plate welded on (2) to one side of the screen at 655mm centres.

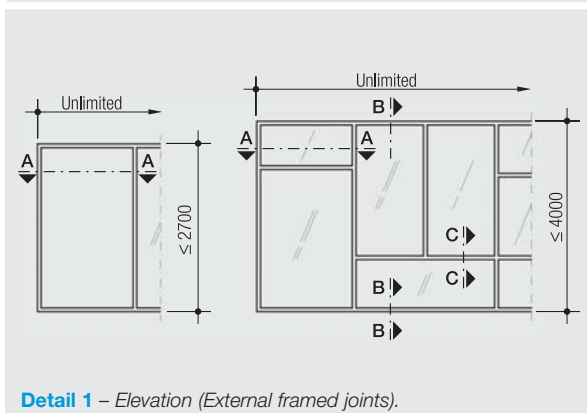
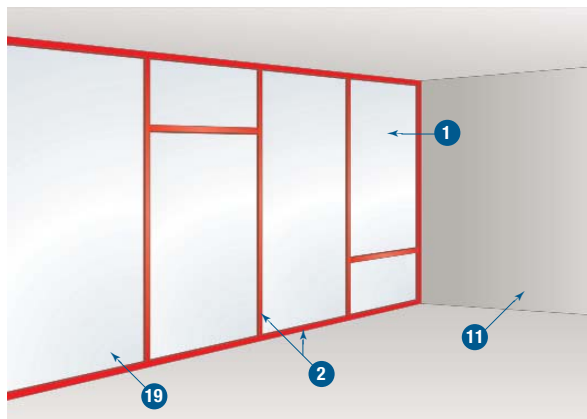
16. Frame fixing bracket of mild steel channel 25mm x 46mm x 1.5mm thick.

17. Notch cut out to top of hollow section to allow installation around item (16).

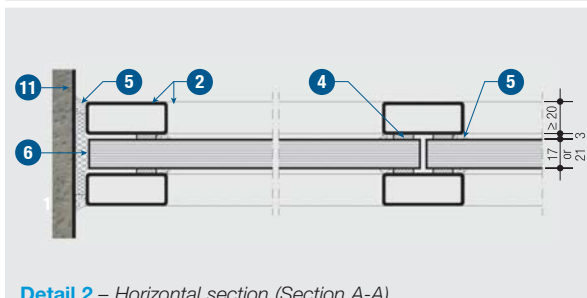
18. PROMASEAL® PL strip, 2.5mm thick.

19. Identification of Promat® SYSTEMGLAS.

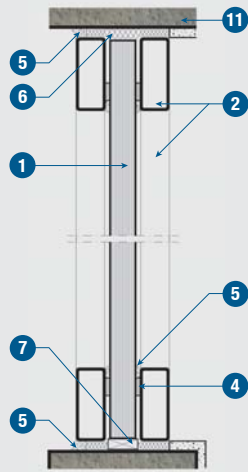
NOTE: Other glass finishes, e.g. tinted, patterned or etched can be supplied upon request.



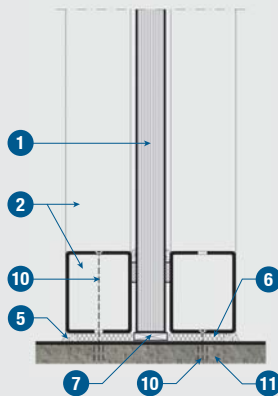
Detail 1 – Elevation (External framed joints).



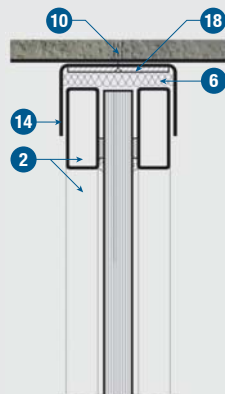
Detail 2 – Horizontal section (Section A-A).



Detail 3 – Vertical section (Section B-B).



Detail 4 – Connection to ceiling and floor (Section B-B).



Detail 5 – Movement joint connecting to ceiling (Section B-B).

Detail 1 – Elevation (External framed joints)

The length of the glazing can be unlimited. The individual glass pane surfaces can be divided according to the specified requirements. For heights of up to 2700mm for both F30 and F60, the glazing can be composed of adjoining individual glass panes without the need for either horizontal transoms or vertical mullion framing members (the maximum dimensions of the individual glass pane need to be taken into account).

In instances where the construction height is up to 4000mm, two or more glass panes are positioned one on top of the other. A transom will cover the horizontal glass joints. This transom section can be adhered with silicone mastic. It should be noted that where protection against impact is required i.e. at heights of some 1000mm above floor level, a framing member can be mounted directly onto the surface of the glass pane by means of adhesion using the Promat® SYSTEMGLAS silicone mastic. This method can also be used to provide visual separation even where there is no joint between the panes of glass. The separating member can be fabricated from steel, aluminium, timber or plastic. The insulative nature of the Promat® SYSTEMGLAS prevents this having any adverse effect on the fire performance of the entire system.

Detail 2 – Horizontal section (Section A-A)

The glazing screen is constructed with front and back frame made of rectangular steel hollow sections (2) with glass panes (1) mounted in between.

The section of rectangular hollow profiles can be increased if required for aesthetic reasons but should follow the minimum requirements as indicated under (2).

Detail 3 – Vertical section (Section B-B)

For the fixing of the frames at the top and the bottom several solutions are available (see Details 4 & 5). The joint to the floor can be sealed with plaster or cement rendering.

Detail 4 – Direct connection to ceiling and floor (Section B-B)

Where wider than normal hollow sections are used as the framing member, it is possible to fix directly through the frame (2) into the substrate beneath (11). Alternatively the more usual method is shown in Detail 8.

Detail 5 – Movement joint connecting to ceiling (Section B-B)

Care must be taken that no additional stress or weight is placed upon the wall system via its framing. If there is any likelihood of movement within the substrate to which the frame is secured, then a movement joint must be constructed which allows for this movement, similar to that depicted.

This detail shows the use of a steel channel profile which has sufficient depth to allow for the expected movement of the substrate above. This channel is secured to the substrate using non-combustible fixings at nominal 500mm centres. The cavity between the underside of the slab and the top of the glass is packed with mineral wool and intumescent strip so ensuring the insulation across the sections under fire conditions is maintained.

Detail 6 – Glass assembly

Each glass panel (1) sits on two or more setting blocks (5). Prior to the installation of the front frame, the glass panes need to be retained against the back frame with small steel or timber holding plates (8) screwed through the gap between panes to the back frame.

Detail 7 – Transom detail (Section C-C)

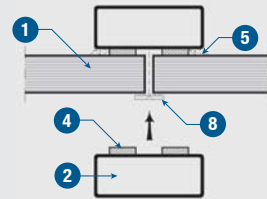
If two glass panes are to be installed vertically, two (or more depending on pane width) setting blocks (7) are used as spacers between each pane. The horizontal joint between the two panes should be sealed with Promat® SYSTEMGLAS silicone mastic. For aesthetic reasons or to protect the glass against possible shocks, transom sections can be glued to the glass with sealant even where there are no joints between the glass panes. The aesthetics of the screen can be enhanced by covering the steel profiles with aluminium or timber cover profiles (9). These cover profiles can be clipped, glued or mechanically fixed to the frame.

Detail 8 – Screw fixed frames assembly

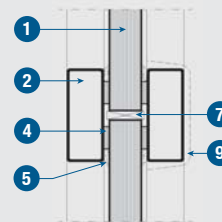
An alternative method of fixing the frame to the substrate is shown in Detail 4. A steel plate is welded to the underside of one steel frame, this plate has a dowel with a threaded hole to take a M6 machine screw. The plate and thus the first frame are fixed to the substrate using non-combustible fixings. After installing the glass panes, the second frame is offered up to the glass and inserted over the dowels. The M6 machine screws then pass through the hollow sections into the dowels thus fixing the frame in position.

The vertical mullions and horizontal transom sections are installed by means of clipping over the steel U-brackets and held in position with M6 machine screws.

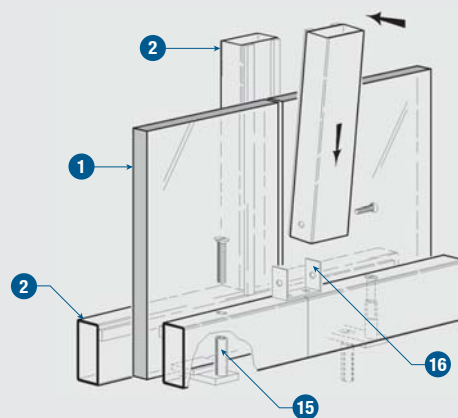
NOTE: All machine screws should have powder coated heads to match the colour of the main framing members.



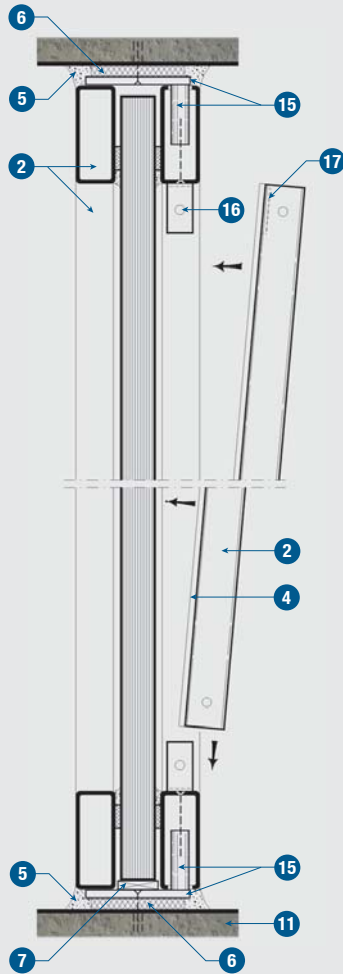
Detail 6 – Glass assembly.



Detail 7 – Transom detail (Section C-C).



Detail 8 – Screw fixed frames assembly.



Detail 9 – Vertical section (Section B-B).

Detail 9 – Vertical section (Section B-B)

The vertical joints between glass panes are to be covered with steel hollow sections in the following steps:

- Steel hollow section (2) is cut to fit precisely between the top and bottom frame members;
- Notch out at the top of the mullion section (17) to allow passage for the steel U-brackets;
- Apply the glazing tape (4) to the profile;
- Screw the steel U-brackets (16) on to the top and bottom profiles;
- Vertical profile (2) is fixed to the steel U-brackets with machine screws;
- Finish the joints with Promat® SYSTEMGLAS silicone mastic (5).

Detail 10 – Transom details

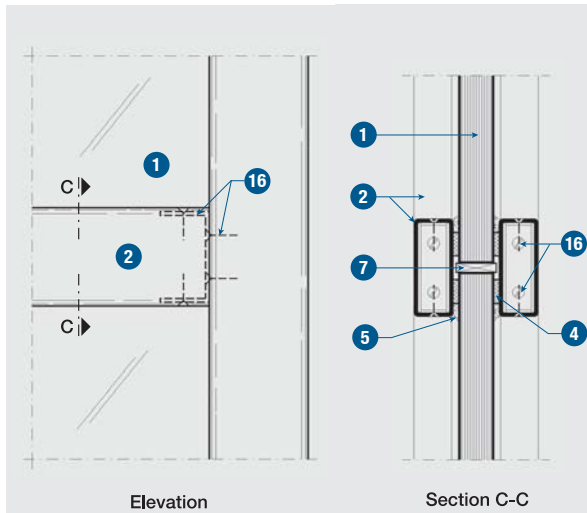
Horizontal joints to be covered with a steel hollow profile (2) and to be screw fixed to the vertical profiles by means of U-steel brackets (16). A transom profile can also be applied as a cover fillet where there are no joints between the glass panes by using glazing tape (4) and Promat® SYSTEMGLAS silicone mastic (5).

Detail 11 – Positioning of fixing plates

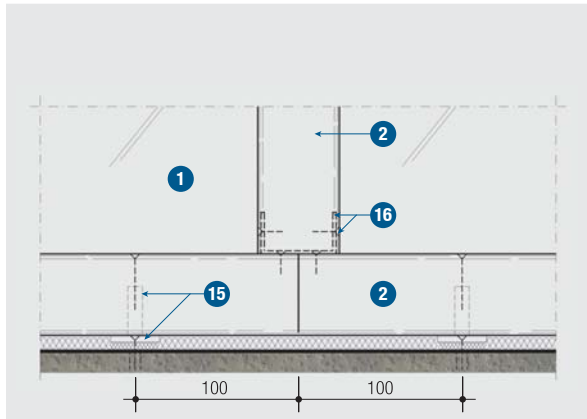
The steel fixing plates (15) should be positioned no more than 100mm from the proposed location of the vertical profiles.

Detail 12 – Connecting steel profile

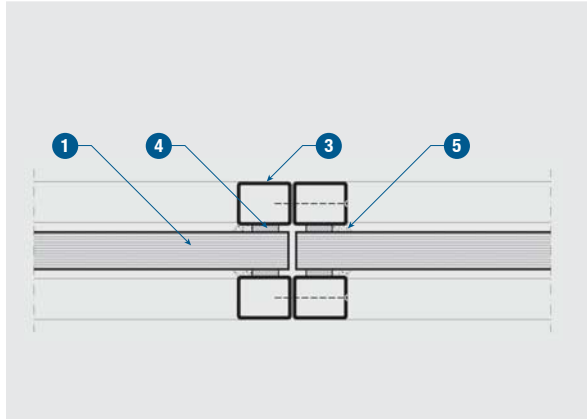
As an alternative to the on-site screw fix assembly method for the frame, prefabricated frames of small steel profiles (3) can be mounted at site and connected to each other with machine screws. In instances of glass breakage, a full section of the frame will require dismantling. The choice between a screw fixed frame, or a single welded frame section, or a number of small steel frames connect to each other, depends on transport restrictions, on the working conditions at the construction site and on the length and height of the screen.



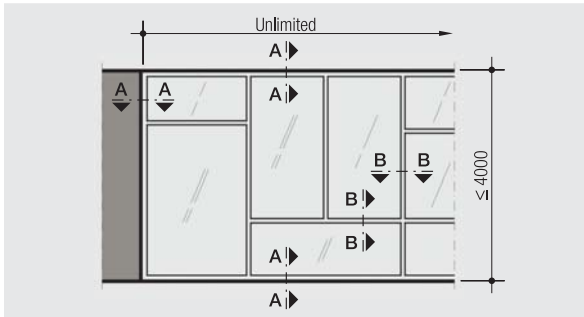
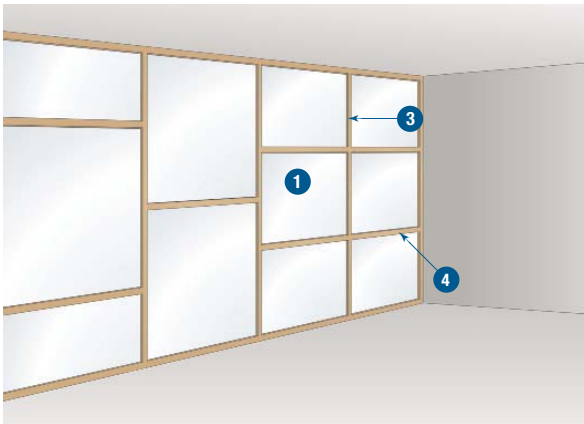
Detail 10 – Transom details.



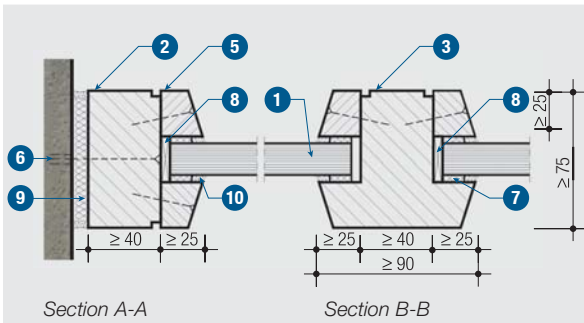
Detail 11 – Positioning of fixing plates.



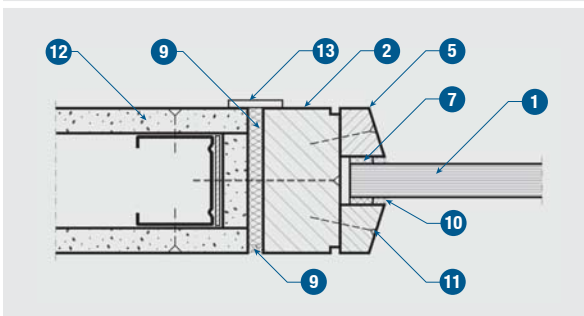
Detail 12 – Connecting steel profile.



Detail 1 – Elevation (Horizontal and vertical timber framed joints).



Detail 2 – Wall connection and mullion detail.



Detail 3 – Alternative connection to lightweight partition (Section A-A).

PROMAT® SYSTEMGLAS SCREENS – TNF1 SYSTEM

TECHNICAL DATA

30 and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS glazing, 17mm thick maximum pane size 2700mm x 1400mm.

60 minutes fire rating:

Promat® SYSTEMGLAS glazing, 25mm thick maximum pane size 2700mm x 1400mm.

2. Hardwood timber perimeter framework, minimum 75mm x 40mm.
3. Hardwood timber mullion section, minimum 75mm x 40mm.
4. Hardwood timber transom section, minimum 75mm x 40mm.
5. Hardwood timber glazing beads, minimum 25mm x 25mm.
6. Steel anchor bolts, 85mm long x 8mm diameter.
7. Self adhesive glazing tape, 10mm x 3mm.
8. Hardwood setting blocks, 4mm thick (required in both horizontal and vertical framing members).
9. Mineral fibre seal or intumescent mastic.
10. Promat® SYSTEMGLAS silicone mastic.
11. Steel wood screws, 70mm long x 3mm diameter.
12. Fire rated dry wall with equal or greater fire resistance to glass construction.
13. Optional covering profiles made of stainless steel, aluminium, wood or plastic profiles.
14. Hardwood timber transom section, 75mm x 20mm.
15. Timber corner posts.

TIMBER SCREEN WITH FRAMELESS VERTICAL JOINTS

As with the NF1 system the timber screens can be specified with butt jointed glass-to-glass joints between adjacent panes of glass.

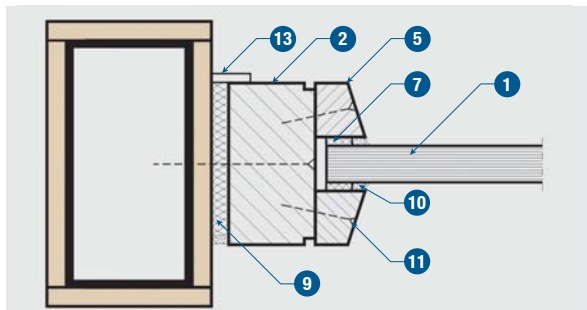
The perimeter framing will be exactly as described above, however the hardwood timber mullions (3) and hardwood timber transoms (4) can be omitted and replaced with Promat® SYSTEMGLAS silicone mastic.

Within the timber system, 30-minute fire rated doors can be specified in a matching timber to provide a complete system.

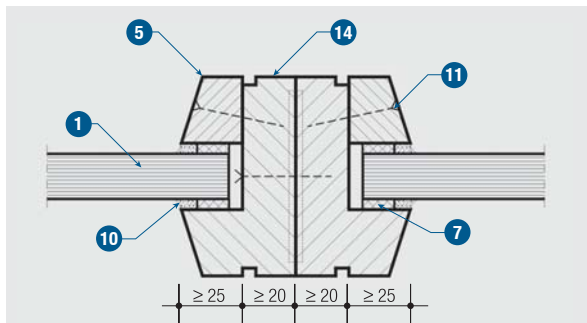
Maximum Clear opening sizes:

Door Type	Height (mm)	Width (mm)	Fire ratings (minutes)
Single leaf	2325	1300	30
Double leaf	2250	2580	30

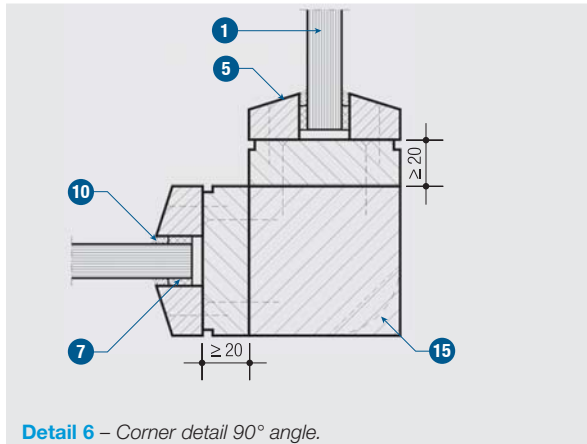
Note: Promat Technical Services Department can provide further details of the door styles available.



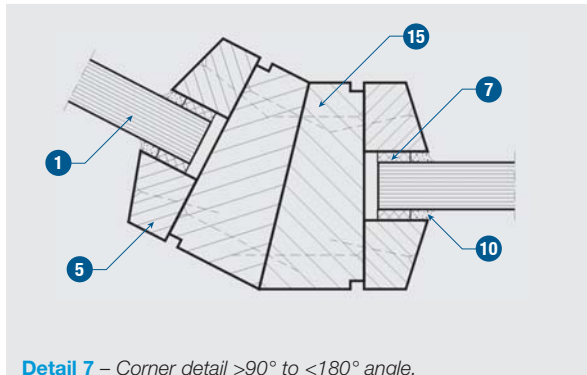
Detail 4 – Connection to structural steel support (Section A-A).



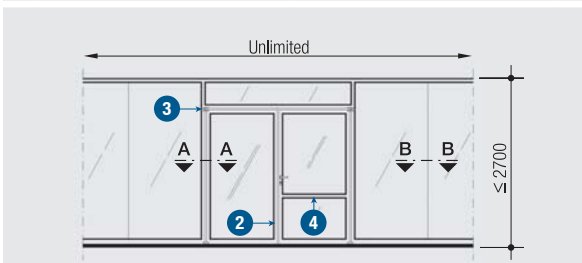
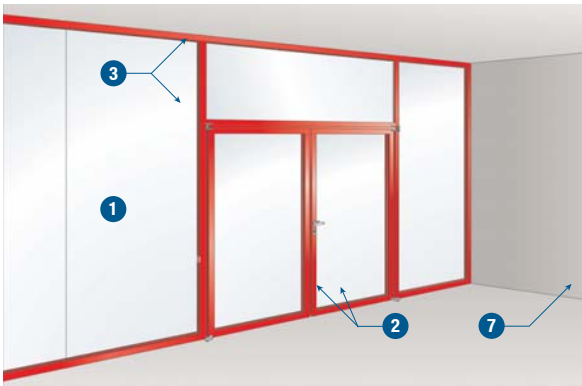
Detail 5 – Mullion detail (Section C-C).



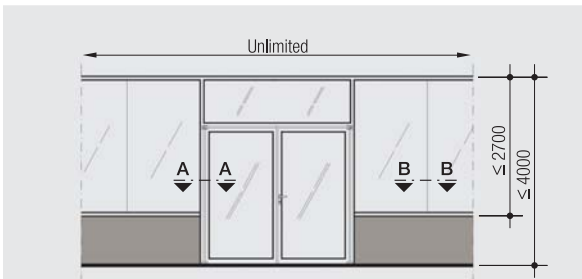
Detail 6 – Corner detail 90° angle.



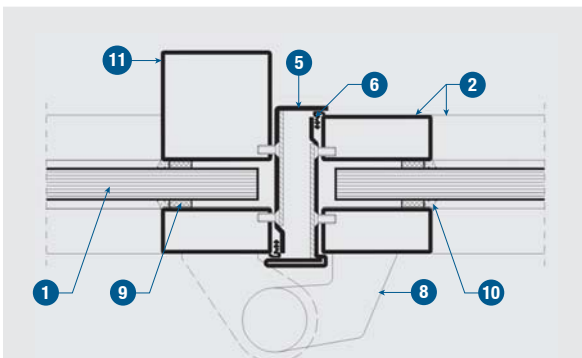
Detail 7 – Corner detail >90° to <180° angle.



Detail 1 – Elevation (within Promat® SYSTEMGLAS screen).



Detail 2 – Elevation (within partly glazed masonry wall).



Detail 3 – Door leaf and frame detail (Section A-A).

PROMAT® SYSTEMGLAS T-DOORS

Fire Doors within All Glass Screens: Single & Double Leaf (Option 1)

Promat® SYSTEMGLAS T-doors are constructed without any visible glazing beads on the retaining frame. It can be built as single or double leaf door in a Promat® SYSTEMGLAS screen or solid wall element. A choice of floor or head mounted closers can be proposed as well as their selected hardware.

TECHNICAL DATA

30 minutes and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, 17mm thick.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, 21mm thick.

- Promat® SYSTEMGLAS door with steel hollow section 60mm x 25mm x 2mm single or double-leaf door for 30 and 60 minutes fire rating.

Clear opening size:

Door type	Height (mm)	Width (mm)	Fire rating (minutes)
Single leaf	2250	1520	30 or 60
Single action			
Double leaf	2312	2370	30
Single action			
Double leaf	2200	2370	60
Single action			

- Promat® SYSTEMGLAS screen in accordance with the details on pages 152–161.
- Optional door mid rail.
- Rebate profile, fixed with self-tapping screw or rivet, optionally welded.
- Rubber anti-shock seal or smoke seal.
- Floor or adjacent walls with fire resistance equal to or better than glazing system.
- Dorma 7431K or similar approved hinge and/or floor spring systems.
- Self adhesive glazing tape, 10mm x 3mm.
- Promat® SYSTEMGLAS silicone mastic.
- Steel hollow section for screen heights over 3000mm, it may be necessary to use a larger profile on the near face of the door frame to provide additional stiffness.

NOTE: Please check with Promat Technical Services Department for details of the maximum glass pane dimensions, maximum door dimensions and the fire resistance periods.

PROMAT® SYSTEMGLAS T-DOOR

Fire Door with Framed Screens: Single & Double Leaf (Option 2)

TECHNICAL DATA

30 minutes and 60 minutes fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

1. 30 minutes fire rating:

Promat® SYSTEMGLAS F30, 17mm thick.

60 minutes fire rating:

Promat® SYSTEMGLAS F60, 21mm thick.

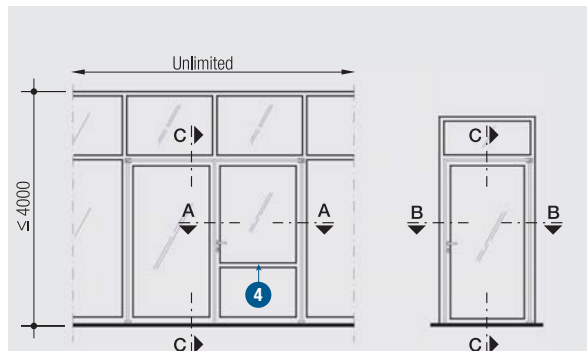
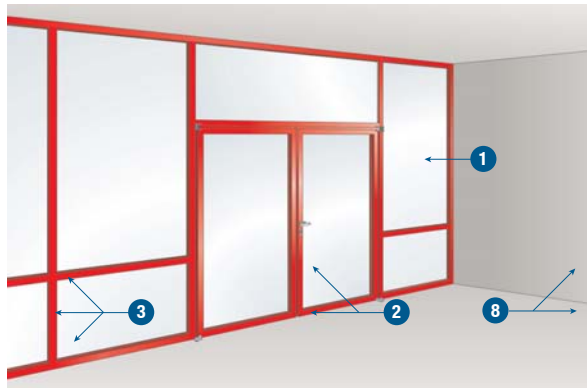
- Promat® SYSTEMGLAS door with steel hollow section 60mm x 25mm x 2mm single or double leaf door for 30 and 60 minutes fire rating.

Clear opening size:

Door type	Height (mm)	Width (mm)	Fire rating (minutes)
Single leaf	2250	1520	30 or 60
Single action			
Double leaf	2312	2370	30
Single action			
Double leaf	2200	2370	60
Single action			

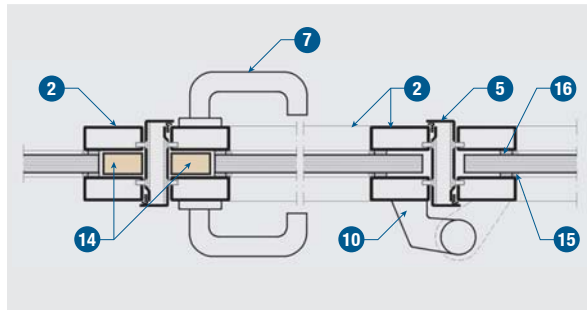
- Promat® SYSTEMGLAS screen in accordance with the details on pages 152–161.
- Optional door mid rail.
- Rebate profile, fixed with self-tapping screw or rivet, optionally welded.
- Rubber anti-shock seal or smoke seal.
- Door handle.
- Floor and adjacent walls with fire resistance equal to or better than glazing system.
- Mineral wool, 15mm thick, compressed.
- Dorma 7431K or similar approved hinge and floor spring systems.
- Masonry fixing, expansion bolt or similar at nominal 500mm centres.
- PROMASEAL® PL strip.
- Steel plate.
- SUPALUX® strip, minimum 27mm wide x 20mm thick.
- Promat® SYSTEMGLAS silicone mastic.
- Self adhesive glazing tape, 10mm x 3mm.

NOTE: Please check with Promat Technical Services Department for details of the maximum glass pane dimensions, maximum door dimensions and the fire resistance periods.

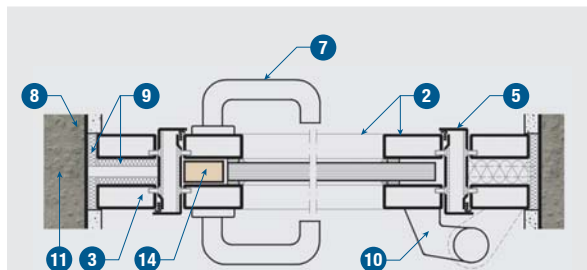


(a) Within Promat® SYSTEMGLAS screen (b) Within masonry wall

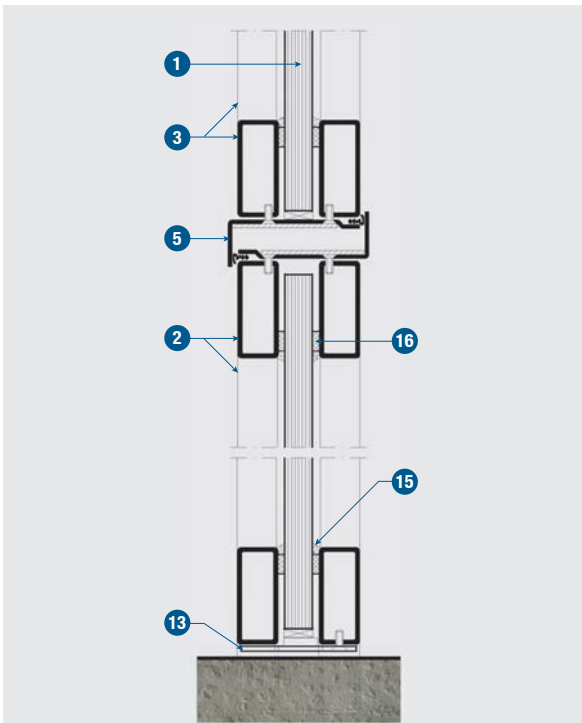
Detail 1 – Elevation.



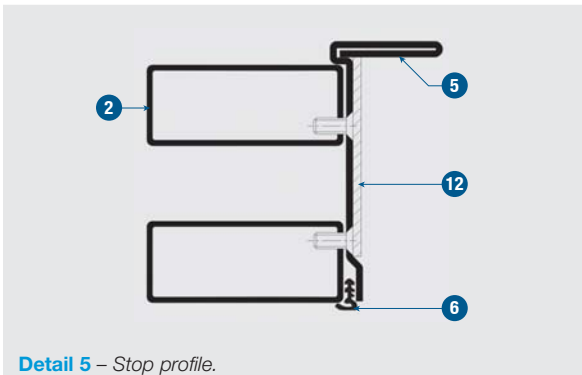
Detail 2 – Horizontal section (Section A-A).



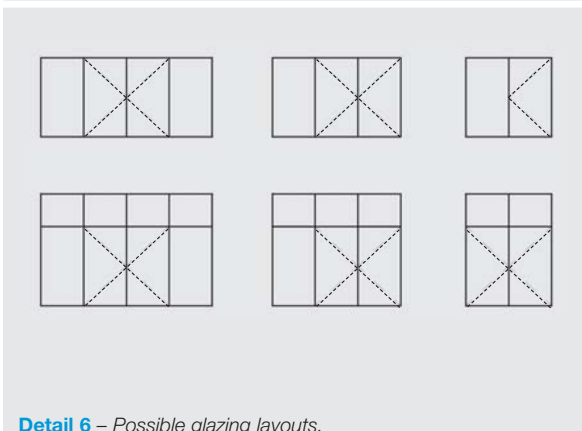
Detail 3 – Wall connection (Section B-B).



Detail 4 – Vertical section (Section C-C).



Detail 5 – Stop profile.



Detail 6 – Possible glazing layouts.

Detail 1 – Elevation

The length of the glazed wall can be unlimited, the maximum height is currently restricted to 4000mm. The door can be manufactured with or without a mid rail.

Detail 2 – Horizontal section (Section A-A)

The door hardware, handles, hinges etc., can be sourced from various manufacturers, but must have certification to prove the suitability for use in PROMAT® SYSTEMGLAS or similar applications.

Detail 3 – Wall connection (Section B-B)

The glass can be mounted on the steel frame that is fixed with the door hinges to the surrounding door frame. The glass can also be easily demounted by removing the screws fixing the rebate profile to those sections forming the jamb.

Detail 4 – Vertical section (Section C-C)

The steel profile forming the door stops is fixed by either screws or welding to the profiles forming the jambs and head of the door framing. This profile can be folded or cold rolled as shown in Detail 3.

Detail 5 – Stop profile

The door frame is made of two steel frames to which a rebate profile (5) is screwed. The door frame can be connected to a solid wall element or to a Promat® SYSTEMGLAS screen (pages 152–161) or a dry wall system or masonry construction.

Detail 6 – Possible glazing layouts

Fire resisting glazed elements can be constructed in a variety of ways. A combination of single or double leaf doors, sidelights, fanlights, etc. is offered to the specifier to obtain the desired visual effect.

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Every care has been taken to ensure that the contents of this Handbook are accurate, however, Promat UK Limited and its subsidiary companies cannot accept any responsibility for omissions, errors or for information which is found to be misleading. Some of the specifications used in this Handbook may not be complete and may not give full fixing details and it is your responsibility to satisfy yourself of the suitability of any specifications mentioned to meet your requirements. If further assistance is required please contact Promat Technical Services Department. In all cases all current building regulations and approved documents and local fire authorities and insurers must be consulted as appropriate.

The information and recommendations contained in this Handbook are based upon the best knowledge available at the time of publication. Promat UK Limited reserve the right to alter products and specifications without notice.

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