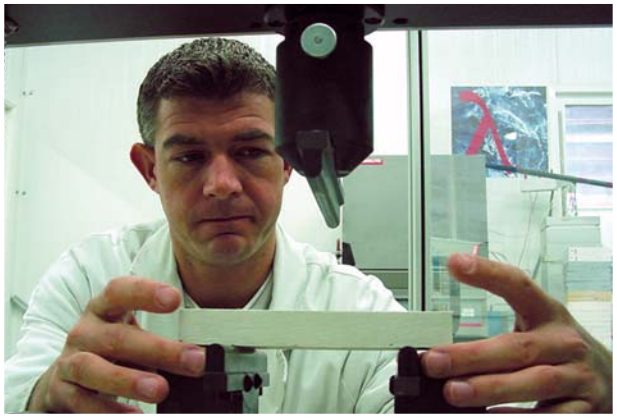
Promat

Fire Door Series

For Promat Asia Pacific Organisation • February 2014

Ever since the dawn of mankind's existence, fire has been something to respect and fear. Without fire we cannot survive, but it is also the most devastating of nature's forces. Mastering fire has always been important and it still is. Mastering fire is the essence of what Promat people do. Developing materials and systems for use within the construction industry that are both fire and high temperature resistant.

The Promat organisation has offices, factories and workshops all over the world, forming a global network of specific knowledge centres concerning fire protection and high temperature insulation. This Promat organisation is part of the well known worldwide group: Etex. Specialising in building materials, the Etex Group offers a backbone structure of knowledge, production and research and development.



Fire Safety in the Building Industry

A good building is a safe building, and an important factor is fire safety. Most countries have developed elaborate legislation regarding fire safe construction, and one of the important tasks for Promat is knowing and understanding the specific rules in each country and helping to close the gap between regulations and the real like. Promat do this by providing a service offering free advice and helping parties within the building industry to make the right choices to realise true safety. Promat technical staff are engaged in a constant search for solutions. They are experts at fire safety legislation, follow the changes and think out and test practical solutions. Support in materials, research and fire test is given by Promat Research & Technology Centre (PRTC), based at the corporate headquarters in Belgium.

Research & Development

Fire resistant constructions are seldom put to the test because not every building burns down. The purpose of fire rated constructions is to allow people to escape from hazardous threat and reach safety. Promat constantly tests its products in order to establish the performance criteria of its professional systems.

Promat run continual investigation programmes at the Promat Research facilities located across the world. The Promat testing laboratories are accredited to the relevant national standards. The Promat furnaces are state-of-the-art and offer multiple possibilities for the testing of construction systems under development.

All Promat materials are manufactured in accordance with accredited EN ISO 9001: 2008 and ISO 14001: 2004 quality management systems. Comprehensive testing of all Promat products and systems has been carried out by independent and nationally approved laboratories around the world in order to meet the relevant sections of BS 476, AS 1530, EN and ISO etc, as well as many other international test standards.

Promat first began operations in 1958. Quality and excellence, refined from more than 50 years of experience give customers the confidence to specify Promat products and systems to suit any fire protection application.

In conjunction with this manual and various other documents, full technical and sales support teams are available to provide information and assistance to help in the design and installation of all Promat fire protection solutions. As this document can only provide the basic construction details for most applications likely to be required on a project, it is inevitable there will be situations that require more detailed information. In this event, please contact Promat and one of the company's technical team will be pleased to assist.

Services

As a leading manufacturer of fire protection products and systems, Promat can supply solutions to most proactive fire protection requirements. Promat know-how is available free of charge at any time, worldwide.
The Promat Knowledge Centre includes:

- Advice from qualified specialists;
- Project-related fire protection solutions;
- Detailed drawings for planning;
- Comprehensive user back-up when applying for approvals;
- List of installation companies, worldwide;
- Innovative fire protection technology, research and development;
- Technical presentations to architects, building control officers, fire officers and regulatory authorities etc;
- Theoretical and hands-on training programmes;
- An international track record, proven over more than 50 years, for optimising fire and security safety in the modern built environment.

Fire Testing

Promat ceiling system test

Promat partition system test

Promat partition system test

Promat door system test

Promat duct system test

Promat small scale fire test

Fire Door Introduction

The life of a fire door is much more than just a simple open and shut matter of functionality and aesthetics.

All doors do much more than merely control the movement of traffic to, from and through the space they serve. At the very least, doors have a major and influential impact on building and energy usage, as well as the general sustainability policy of every structural space.

Nowadays, reflecting increased concern for sensible Green Building policies, doors have to perform much more efficiently than ever before. In their ordinary life span, fire doors must survive year after year of functional use. In most locations this can also mean extended periods of time of abuse and high wear and tear.

Doors generally and fire doors specifically have to be built tough and durable just to be able to survive intact and functional to the day they are called upon to deliver their stated fire door promise in an actual fire scenario.

Fortunately, for must of us, fire doors will never have to perform as fire doors.

Nevertheless, to be considered effective, functional fire doors generally must be able to sustain not only the published fire performance levels of the overall building but also provide same or better fire performance characteristics than the surrounding structural and building components in which the doors are sited.

For regulatory agencies, building owners and developers, planners, designers, architects and engineers, fire doors must be tested, tried and proven to recognised and prevalent fire and building code standards.

Some fire doors can be fabricated entirely of Promat fire resistant materials but most - for reasons of cost, aesthetics and promised performance benefits - use a combination of materials.

General Principles of Fire Door

The design and construction of fire resisting doors is a complex operation involving the skills and specialised knowledge of architects, fire experts, door manufacturers and ironmongers.

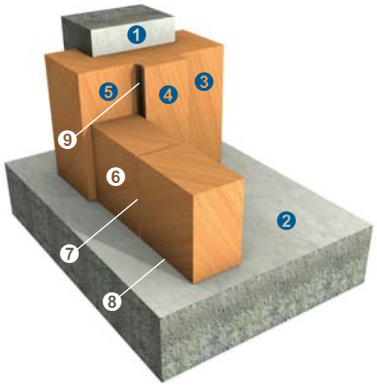
The architect is the first in the line of those concerned with the provision of fire doors. It is he who ascertains the requirements of the building users and decides where and in what form doors will be required. He also assembles the specialised information from the other experts, and arranges for the doors to be manufactured.

The first principle to be considered in relation to Fire Resisting Doors is that, in most respects, they are merely ordinary doors with certain additional features, and throughout most of their life will be operating as such. Indeed it is hoped that most fire doors never have to function in a fire situation.

Fire resisting doors, therefore, have to be opened, closed, locked, latched, bolted, cleaned and maintained like any other door. They need to be able to resist the wear and tear of normal use and in many cases, of abuse. They need to be of robust construction and capable of being fitted with a wide range of glazed panels and ironmongery. They frequently need to be protected from damage.

The planning of a building involves arranging of circulation routes and allocating rooms and spaces, with all their servicing needs. It is then necessary to locate openings and/or doors to provide access from space to space. Single or double doors must give suitably sized clear openings to permit the passage of pedestrian and vehicular traffic. Doors must be hung or pivoted to open and close to suit the requirements of the occupants. Doors will frequently be required to be self closing and some will be fitted with locks

Main Part of Door Assembly



1. Wall
2. Floor
3. Door Frame
4. Door Stop
5. Rebate
6. Door Leaf
7. Meeting Stile
8. Treshold / Door Bottom
9. Intumescent Strip

Fire Rating

Compartmentation for fire containment is usually stipulated by local regulations and other legislation and guidance. These and the need for means of escape in the event of fire will determine the period of fire resistance performance which fire doors must provide.

Visibility

Through vision will be required for some fire doors, so that smoke or flames may be seen and collisions avoided. One or two vision panels may be fitted.

Where single vision panels are used, the bottom of the glass must be no higher than 1000mm above floor level to permit visibility by smaller persons or wheelchair users from either side of the doors.

Smoke Resisting Doorsets

A solution for the problem of smoke at ambient temperatures, before fire has raised these to a level at which the intumescent seals activate, is now required by some National Building Regulations.

Closed doors and minimum sized gaps are an essential first line of defence, but once smoke is in sufficient volumes and at pressure, only specifically design smoke-sealed doors will reduce the passage of smoke to levels stipulated in most regulations.

However, the problem of ill considered, badly designed and inadequate or poorly fitting seals can still be seen in many buildings. If seals are fitted which jam tightly against the faces of door and frame, the doors will not open and close properly. Empirical evidence indicates that in large numbers of fire doors where smoke seals have been improperly fitted, doors do not close fully, thereby allowing more smoke through than doors without seals.

Many of these doors when fitted with smoke seals require far greater opening forces than the weaker occupants of buildings can employ, particularly if stronger closers are fitted to overcome the extra resistance caused by seals.

Levels of performance concerning operating forces are gradually finding their way into British and European Standards covering these components.

Seals should be selected which do not increase opening forces beyond these levels. Suitable seals are available, generally of highly flexible thin blade type, made of polymeric materials.

The simplest method of providing smoke seals is to fit combined smoke/intumescent seals. Alternatively, smoke seals may be provided as separate items and fitted into slots in the door edges and frames. Both methods have been proven by tests, and are available from Promat as part of the company's PROMASEAL® range of products.

Smoke Tests

Comprehensive tests on full size smoke resisting doorsets have been carried out by industry. These tests included the essential requirement of measuring the operating forces of the doors when fitted with seals.

The tests showed that unsealed straight through gaps of about 3mm resulted in the passage of 38 m^3 of smoke per hour per metre run of gap at 25 Pascals pressure.

The results, on single swing double doorsets showed that it is not difficult to add smoke seals and achieve a passage of smoke through the door set of comfortably less than the generally required 3m^3/m /h of gap, at a pressure of 25 Pascals.

However in the case of double swing double doors, and also the gaps between plain meeting stiles of any pair of doors, such straight through gaps are more difficult to seal.

The solution for double swing doors, and all straight through gaps in any pairs of doors, is to fit two rows of thin blade smoke seals, one towards each face of the door, passing and sealing all items of ironmongery.

These designs of double swing door set give results well within the required 3 m^3 per metre run of gap per hour at 25 Pascals, operating forces are still within acceptable limits.

Gaps between doors and/or frame need to be slightly wider when fitted with smoke seals.

Seals

Gaps between edge of door leaf, and door frame itself, must be sealed to prevent the passage of flame, smoke and fumes

It should be noted that the fire performance of the doorset is indelibly tied to the intumescent strips which were used in the fire test on the system. As a general note, intumescent sealing strips should not be substituted for a different make, type of material, or dimension, as such a change could seriously affect the fire performance of the doorset. Similarly, the position and orientation of the strips in use must at all times match that of the tested system.

As an example of the above, it should be noted that there is a wide variety of seals available in today's market. These range from soft, low pressure and low expansion types, to hard, high pressure and high expansion varieties. It has been shown that the use of a high pressure intumescent within a door system designed to use a low pressure system can seriously affect the fire performance of the door, e.g. the high pressure strip can actually force open the door leaf, resulting in gaps through which fire can pass.

It is also important that the seals are installed exactly as per the tested door set.

Thresholds

These are not normally required to be sealed. However, situations such as doors to protected pressurised escape staircases may require seals at thresholds. Some solutions have been tested and shown to give satisfactory results. It is essential that these seals do not drag on the floor and restrict the opening and closing of the doors, but merely reduce the gap to the minimum.

Air Tightness

It is necessary for all other gaps in or around smoke control doorsets to be sealed, to avoid invalidating the smoke resistance performance of the door set. These include gaps between frame and partition, around glazing ironmongery and through the partition itself.

Acoustic

Doors and door-frames are often the weakest links in sound transmission from and into the room. Acoustic doors are typically constructed from multiple layers of a variety of materials. The different layers contribute to the attenuation of sound effectively giving the incident sound waves more barriers to pass. Sealing the gaps around the door is also crucial to reduce the amount of sound entering or leaving the room.

Most frequently requested door acoustics sound reduction levels are:

- 30 - 33 dB for general use, incl classrooms
- 35 dB for sports halls
- 40 dB for music & rehearsal rooms, recording studios and concert halls

Factors for Choice

Choice of intumescent is critical. The factors for choosing a specific type or size of intumescent strip for a fire and smoke door depend on:

- The fire resistance required (e.g. half or one hour)
- The type of door (e.g. single or double-leaf)
- The meeting stile detail if pairs of doors are involved. Plain meeting stile seals are sealed differently from those for rebated meeting stiles.

Fitting of Intumescent Strips

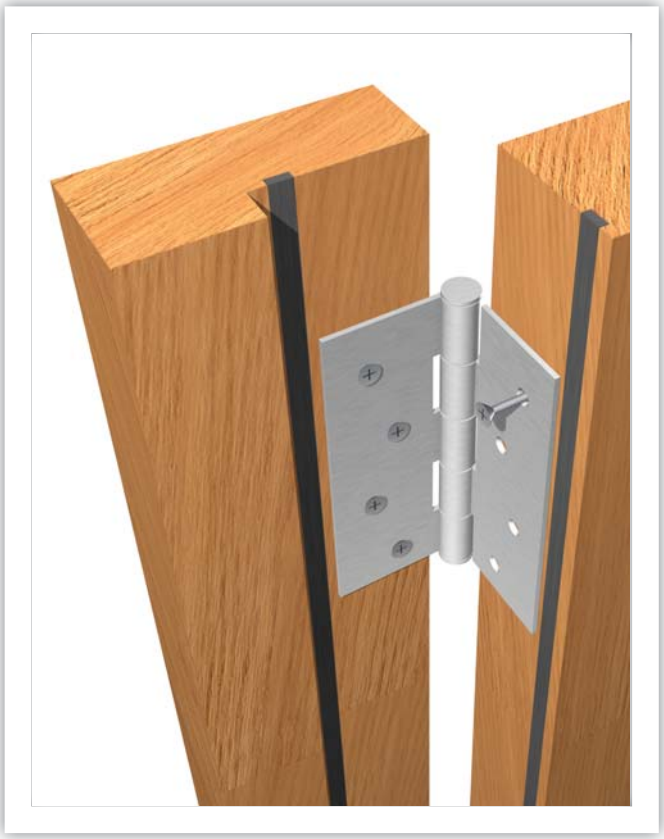
The preferred positions are:

- Fire protection only - fit into a groove in the frame
- Fire and smoke protection - fit into a groove either leaf or frame. The leaf edge normally preferred due to lower resistance it encounters on closing, thus avoiding sticking door leaves on site.

Various Locations for Applying Intumescent Strips

Details 1 to 4 overleaf show various locations of applying intumescent door strips. Some strips are interrupted by hinges on the door leaf or door frame, some are continuous. Detail 4 shows strip interrupted by lockset and thus acceptable for a 30 minutes doorset (subject to supporting test data). However, for a 60 minutes doorset, the strip should be continuous past the lockset.

Therefore, always check fire test reports to see how the manufacturer positioned the intumescent strips and door seals. When installing the doorset at site, the strip position must match the tested system.



Detail 1 Intumescent strips bypass hardware

Detail 2 Intumescent strips interrupted and continuous in leaf only

Detail 3 Intumescent strips interrupted by hardware in both leaf and frame

Detail 4 Intumescent strips interrupted by hardware not suitable for doors expected to perform beyond 30 minutes

Site Installation

With fire and smoke doors it is even more important that doorsets are installed as specified including gaps between door leaves and frames, and between meeting stiles. These were based on BS 4787, but have been shown to be difficult to achieve on many building sites.

Gaps are shown as:

- 2mm + 1mm - 0.5mm, at heads, jambs and meeting stiles, and
- 3mm + 1mm - 0.5mm, at thresholds.

It is recommended that the gaps between leaves and frames should be increased to ease site problems, and allow for the fitting of smoke seals. This will allow for the satisfactory fitting of several types of smoke seals.

Gaps at heads, jambs and meeting stiles should now be:

- 3mm + 1mm - 0.5mm,

Threshold gaps should now be:

- 4mm + 1mm - 0.5mm, for single swing doors, and
- 8mm + 1mm - 0.5mm, where floor springs are fitted.

Where floor springs are fitted, the gap at the threshold must be 8 to 10mm. If this gap is considered unsuitable for certain doorways, smoke/draught seals may be fitted to the underside of the door leaves. It is vital that these do not drag on the floor and impede the opening and closing of the doors, but nonetheless reduce the size of the gap beneath the doors. Alternatively, this could be done by providing additional timber to the underside of the door leaves, where not above the floor spring.

On any door set where smoke may be experienced, the gaps between frame and partition opening must be effectively sealed.

Observations of many fire tests, and of the fire doors installed in buildings, some where fires have occurred, show that slightly larger gaps of, say, 3 to 5mm have little effect on the overall fire resistance of the door set (although this may adversely affect their resistance to the passage of smoke).

The intumescent seals used to close the gaps on almost all fire doors can quickly activate and effectively seal the gaps. BS 8214: 2008 recommends the dimension of 4mm for gaps.

Where gaps of more than 5mm are found it is recommended that these are dealt with by remedial methods because, in addition to the risk of fire, smoke or air penetration, ironmongery such as locks, latches, and bolts may not function efficiently with wider gaps.

It is essential that fire/smoke doorsets are carefully and accurately installed in accordance with manufacturers specifications. If this is not carried out accordingly experience indicates that effective fire protection and smoke sealing is unlikely to be achieved. This is particularly important in the case of double swing doorsets fitted with smoke seals.

Regular inspection and maintenance is essential to keep smoke doors in their “as designed” condition.

Manufacture

The fire resistance of doorsets applies to complete doorsets, including the leaf, frame, furniture, the fit of the leaf in the frame, the method of fixing to the surrounding construction and the type of surrounding construction. The fire resistance of doorsets with timber leaves can vary greatly depending on the use of timber frames or steel frames and the restraint afforded to the frame by the surrounding construction.

Timber Door Frames

The risk of premature failure of fire doors due to the distortion of their timber frames can be ignored if the frame has been formed from straight-grained material and is adequately fixed to the surrounding structure. The rate of charring of timber frames is of much greater significance. Charring rate is generally closely related to timber density. Commercially available softwoods with densities of at least 420kg/m^3 have been shown by test to be suitable as door frames for assemblies with fire resistance ratings of FD20 and FD30.

Certain 54mm thick door leaves with a fire resistance of FD60 have been successfully tested using frames of selected softwood. It is more usual however, for timber with a slower charring rate to be used for this application, normally hardwoods with densities of 650kg/m^3 or greater. FD60 assemblies incorporating leaves of 44mm thickness will be less tolerant of lower density frames and the timber density used for thinner leaves becomes much more critical.

Timber based door frames for assemblies that are designed to provide fire resistance periods in excess of 60 minutes will either be manufactured from very high density timbers or incorporate proprietary protective materials in the construction. The impregnation of softwood with flame retardant salts has been shown not to make a significant contribution to the fire resistance of timber fire doors.

Door frame material should, therefore, be free from wild grain, and have the density and cross section of at least that used in the validating test or in any other approved specification.

A change in door frame specification from the original tested construction which involves the use of timber of greater density or cross section is acceptable without the need for further test evidence or assessment. In some cases, however, certain types of hardwood char at greater rates than others of similar densities. Any changes should therefore only be made after checking with the appropriate authority.

Steel Door Frames

Steel expands when heated, and furnace temperatures in excess of 800°C and 900°C are experienced during 30 minutes and 60 minutes exposures respectively in the standard fire resistance test. Steel door frames will have one cooler edge on the unexposed face of a doorset under test whilst the other edge will be exposed to the fire.

The heated edge of the frame will expand with such force that the frame members will endeavour to bow in towards the furnace at mid height. The very different thermal behaviour of timber will produce different and often opposite modes of distortion or bowing in the timber door leaf.

The result is that the edge of the door leaf will tend to separate from the frame, thus contributing to loss of integrity of the door assembly.For periods of fire resistance of up to 30 minutes some composite metal frames incorporating steel liners, often forming part of a partitioning system, have successfully incorporated timber based door leaves. Frames for doors with a fire resistance rating of 60 minutes invariably require a method of controlling their distortion.

Most commonly the steel frame sections are infilled with cementitious material or are securely fixed to a masonry surround with masonry passing into the rear of the frame section. As well as providing a mechanical restraint, intimate contact with masonry produces a heat sink effect, further assisting in reducing distortion of the steel door frames.

Filling the steel frame with mineral wool will tend to reduce the fire resistance of the door assembly as the presence of the mineral wool eliminates any heat sink effect of the surrounding construction and increases the temperature difference of the steel frame between the fire and non-fire sides, thus increasing the bowing forces. Steel door frames should be of the type tested and fixed in accordance with the tested condition.

The relatively high thermal conductivity of steel will mean that there may be a possibility of the unexposed face of the steel frame reaching temperatures sufficient to ignite timber, e.g. the unexposed face of the door leaf. The other main problem associated with a steel frame having reached several hundred degrees Celsius by conduction is the effect upon the intumescent or heat activated seal used to protect the leaf to frame clearance gap. Intumescent seals work most satisfactorily when bearing against timber surfaces.

The insulating properties of timber will mean that even during fire exposure the expanding seal will act against the uncharred timber surfaces of door leaf edge and door frame towards the unexposed face of the doorset. However, in the case of a steel frame the seal will act against a steel surface heated by thermal conduction. This may degrade the seal more rapidly, thus reducing the period for which the seal remains effective.

Thermal expansion of a steel frame will lead to an increase in its internal dimensions, i.e. the opening size for the door leaf. This will lead to an increase in the leaf frame clearance gap, thereby placing a greater performance requirement on any seal used to protect this junction. Intumescent seals do not expand indefinitely, and the specification for such seals in this application is normally greater than would be used with timber frames.

It should be clearly noted that, simply because a steel frame forms part of a door assembly with a timber based door leaf and achieved a satisfactory fire test result, it does not follow that the steel frame is suitable for combining with any other timber based door leaf.

Timber based door leaves should not be hung in steel frames unless substantiated by specific test evidence. Such door assemblies do not easily lend themselves to assessments.

Compatibility of Door Frames with Surrounding Structure

The surrounding structure or wall into which a fire door is built will exert an influence upon the fire performance of the assembly only if excessive distortion is likely as a result of fire exposure. This is a significant consideration where steel frames are used.

Masonry walls and non-loadbearing timber stud walls are reliably stable and generally present few problems. Some partitions may be prone to distortion. In some instances a timber door frame can limit the distortion of a steel stud partition.

The most problematic combination can be timber door leaf in a steel frame, within a steel stud partition. The steel door frame or steel stud partition will undergo both a certain degree of expansion and/or distortion during fire exposure and this cumulative movement may not be tolerated by a timber door leaf.

Unless differential distortion between the wall and the door assembly is unlikely, the compatibility of a door assembly with an adjacent wall should be established by test.

As can be seen from the above, specifiers need to consider more than the performance of the door leaf or door frame in isolation, and the effect of merely changing one component can have on other components. The detriment that these factors can have on the overall system is well documented.

Ironmongery For Fire Resisting Doors

The ironmongery fitted to a door is one of the most critical influences on its functionality and fire performance.

Designs for fire doors should always include a full range of ironmongery. When assessing proprietary doorset designs it is necessary to ascertain that appropriate evidence is available to show that these doorsets have passed the tests fitted with a full complement of ironmongery.

Test certification should include a full range of the following ironmongery:

- Hinges and pivots
- Floor springs with shoes or straps, top centres, pivots and other accessories.
- Overhead closers
- Mortise cylinder locks, mortise latches, flush bolts

Fire resistance doors are required to be self closing except in special cases such as duct doors. Some form of closing device must normally be fitted. Latches are therefore often unnecessary and in many cases may actually be an inconvenience.

The most important aspect of specifying a fire door, is to ensure that the proposed products and systems completely satisfy the highest standards of performance. All designs detailed in this brochure have been subjected to stringent fire tests carried out by independent and approved laboratories in accordance with the relevant criteria of BS 476: Part 22.

It should be clearly noted that a doorset may have to act as an effective fire barrier at any time in its lifespan and thus must deliver 100% of its performance promise, be it a few days old or towards the end of its serviceable life span as prescribed by its manufacturer, specifier or installer.

At all times every consideration must be given to "FITNESS FOR PURPOSE" relating to all aspects of the fire door's performance.

For further information concerning design, testing or specification of fire resisting doorsets, please consult the nearest Promat office.

Vision Panels

Vision Panels can be used in situations where both security and vision are important such as hospitals, schools, universities, banks and high value retail outlets. To increase levels of security and avoid unwanted accidents, the use of vision panels in fire doors is often necessary.

Any opening cut into a fire door introduces a potential weakness, great care has to be taken to ensure that all vision panels are installed correctly with the correct fittings and fully meet all certification requirements.

Different types of vision panels offer varying levels of fire performance. These must much adequately meet or exceed the fire performance promise of the surrounding door materials and indeed the door frame and other nearby structural components.

Use of vision panels must be substantiated by fire test in the specific door set construction in which they will be installed.

General Principles

Assessing suitability of existing doors to 20 minutes or 30 minutes fire resistance levels - a characteristic comparable to purpose - built fire doors - is the first vital step in any needs analysis programme.

Although any closed door will have some delaying effect on the development and spread of a fire and its attendant fumes and smoke plume, a fire door must be proven to be capable of resisting the effects of a standard fire test for periods of not less than 20 minutes or 30 minutes. In some instances, building code regulations will also look at 60 minutes or even longer performance requirements. Not surprisingly, the requirements for fire doors can be quite complex.

Purpose Built Fire Doors VS Door Upgrading Programmes

Most fire resisting doors are purpose designed and manufactured, involving not just the basic door structure but also its leaves, frames and even accessories such as hinges and locks.

When refurbishing or upgrading the structural fire protection of existing buildings, it is usually preferable to install new and fully certified doors which incorporate the latest technology, proven to perform consistently in the event of fire.

There are, however, certain situations - such as existing doors which have particular design appeal, unusual design or shape - in which it is desirable or necessary not only to retain existing doors but to increase their sometimes minimal fire resistance to acceptable, regulatory or statutory levels.

These include but are not limited to a change of use of the building necessitating compliance with Building Regulations and local building by - laws or retroactive legislation generally improving overall safety standards throughout the structure.

Buildings of heritage or sentimental value, in which the architect or engineer wishes to maintain structural character while improving fire protection, are understandably the target of many planned upgrading works.

Upgrading is also considered appropriate when doors of very substantial construction require just a little modification to bring them up to the required level of performance.

Circumstances naturally vary from building to building and indeed door set to door set, so it is therefore important to carefully examine each case individually when assessing the potential for upgrading.

Normally, representative samples of intended fire door set design are required to be tested to BS 476: Part 22: 1987 (Methods of determination of the fire resistance of non loadbearing elements of construction) in order to validate the door's use in mandatory circumstances.

Clearly, this is rarely if ever feasible with door sets of special or historical merit which have been upgraded. In most of these cases, regulatory authorities are willing to accept assessment of likely performance in the test provided it is by a competent authority such as an accredited fire test laboratory or qualified independent fire consultant.

Upgrading for such doors is usually within the 20 minutes or 30 minutes fire resistance category but 60 minutes performance is also possible in some cases. However, the latter would in most cases be considered difficult to upgrade.

Most information on door upgrades applies to "normal" sized and shaped doors. Specific guidance from a registered fire resistance testing laboratory or specialist independent fire consultant is usually required for non-standard sizes.

Suitability Of Doors For Upgrading

It is important to determine with building inspectors and fire authorities the appropriate level of fire resistance performance required.

If upgrading is acceptable to the regulatory authorities, the next step is to accurately assess whether each existing door and frame under consideration is suitable. This will depend not only on the design and materials used but also very importantly on its current condition.

For example, the leaf itself needs to be in good condition with no gaps or loose joints. Where leaf edges have endured repeated impact or damage, they should be trimmed neat and re-lipped to provide good, clean edges. This operation can also correct doors which are not true and/or fit poorly in their frames.

Fixing methods and accessories in leaf construction are also important, particularly where materials in old doors have been adhered together with animal glue or casein, a milk based glue. These soften on heating, making it necessary to reinforce old glue lines with mechanical fixings to prevent joints opening when exposed to fire.

If possible, metal fixings passing through the full leaf thickness should be avoided as they transmit heat from the fire to the unexposed side of the door set. If metal through fixings are important in maintaining the style of the door, they should be protected by the use of intumescent or insulating materials between the fixings and the leaf.

If the door, on the other hand, does not require a face-to-face upgrade but the appearance of the needs to be maintained on one or both faces, it may be necessary to "split" the door in two along its thickness axis. One or both faces can then be adhered to a fire resistant board, offering a rather odd but workable method that can maintain almost 100% of the original visual aspect of the door.

In fact, close examination of detail in construction of door leaf is key to determine door's potential for upgrading. A substantial, paneled hardwood door, for example, may require little attention while an unframed hollow-core flush door or a ledged and braced design is unlikely to be suitable for useful upgrading. Nevertheless, between these two extremes there other designs in use and the following table provides general (but not exhaustive) guidance on upgrading the more common varieties of door leaf to 20 minutes or 30 minutes fire resistance.

Type	Upgrading Possible	Comments
Unframed, hollow core, flush	No	Too light and insubstantial (though this is general, Promat has has test data to upgrade hollow core doors)
Framed, hollow core, flush	Maybe	Depends on strength framing
Framed, solid core, flush	Yes	If core of cork. Flaxboard, timber or chipboard
Ledged and braced	No	Only if appearance altered (as board goes onto one face)
Framed, ledged and braced	Yes	One-side upgrading
Sandwich type	Maybe	Depends on materials and form of construction
Framed, solid with solid panels	Maybe	Depends on thickness, minimum 44mm, section dimensions for rails and stiles, timber type.
Framed, solid with glazed panels	Maybe	Depends on thickness, minimum 44mm section dimensions for rails and stiles, timber type. Difficult if glazed area has small glazing bars.

Suitability for upgrading goes beyond mere practicalities and economics. Feasibility also depends on aesthetics and how many changes in appearances will be acceptable, particularly if there is some doubts about the desirability of the original appearance for both sides of the door.

Frequently Asked Questions Regarding Fire Doors

1. What is a fire door?

   BS 8214:2008 states: 'A fire door is provided for the passage of persons, air or objects which, together with its frame and furniture as installed in a building, is intended (when closed) to restrict the passage of fire and/or gaseous products of combustion, and is capable of meeting specified performance criteria to those ends.' Typically, timber fire door (assemblies) are specified to provide 30, 60, 90 or 120 minutes resistance when tested to either BS476: Part 22 or BS EN 1634.

2. When are fire doors needed?

   - Where a door leads to exit stairwells and horizontal exits;
   - Where a door leads to a hazardous area;
   - Where a door has Exit signage above or next to it;
   - Generally, where a door leads to a hallway or from one fully enclosed room to another.

3. What is the difference between a smoke-stop door and a fire check/fire resistant door?

   Smoke Stop door – Provides resistance only to the passage of smoke and other combustion products. NOT subject to the full severity of a fire because of their location.

   Fire Resistant Door – Requires resistance to the passage of smoke AND also blocks fire by containing it and compartmentalizing it. It has to meet both the requirements of smoke and flame resistance.

4. How can existing doorsets be upgraded?

   There are numerous methods for upgrading existing doorsets to enhance their inherent fire resistance, although every upgrade is specific to each doorset and consequently may not necessarily be appropriate for another design. The only way to ensure that the most appropriate method is chosen and to have the enhanced integrity performance underwritten, is by commissioning a site survey by a qualified fire engineer. The relatively large number of components that make up a fire resistance doorset are integral to its performance and a comprehensive knowledge of these components is needed. For example:

   - Whether the door can be upgraded to the required integrity and/or insulation;
   - What the most appropriate upgrading solutions are.;
   - If there are other issues that may negate the performance of the door, such as sidelights or over panels;
   - How to address glazing, panelling, ironmongery, core type, intumescent and other considerations.

5. Is a 10 x 2mm intumescent seal for 30 minutes integrity and a 20 x 2mm intumescent seal for 60 minutes integrity adequate?

   While it is generally true that larger intumescent strips are used for higher integrity periods, the intumescent specification for the door must be as tested or assessed for that particular doorset. This is particularly relevant to:

   - The size of the intumescent seal;
   - The location of the seal;
   - The type of seal.

6. Can intumescent strips be over-painted?

   Most manufacturers of intumescent seals recommend that, in ideal circumstances, intumescent strips should not be painted over. Basically non-hygroscopic intumescent seals can be over painted without detracting the fire performance. One example is intercollated graphite. For further clarification contact the seal manufacturer for supporting evidence and advice.

7. How often do fire doors need to be inspected??

   To maintain their passive fire protection systems, healthcare facilities for example are typically required to have all fire doors inspected annually.

8. How do I know if a particular application requires a fire rated door, and where do I find the specific information or those requirements?

   You should always make reference to your local building code and seek guidance from your building inspector on the specific fire door requirements of your project.

9. What is the different between steel fire doors and wooden fire doors?

   Steel fire doors generally offer a much longer duration of fire resistance compared to wooden fire doors.

10. Before installation, what should i check on my fire door?

    - The label on the door and frame – it is evidence that the door and frame is certified;
    - The instructions on the door – they should be followed to ensure correct installation;
    - The frame specification – should be correct for the door's fire rating;
    - The Building Regulations – are you following ALL of them correctly;
    - Apertures ONLY from Licensed Converters – DO NOT cut apertures within fire door leafs on site;
    - The gap between the door and the frame – is important and should be as per the tested system.

Promat Range of Fire Doors

VICUDOOR

❶ VICUDOOR: VD1

Designed with recessed paneling and trimmed with decorative timber beads. Best employed to achieve a grand architectural statement and ideal for entrances to commercial premises, hotel room doors, residential units and along protected passageways. Provides versatility in fine finishes, ensures fire resistance and high levels of smoke/fume tightness. See page 13 for full details.

❷ VICUDOOR: VD2

Offers designers flexibility of choice and high levels of visual impact without jeopardising actual fire performance. Fabricated entirely from fire resistant Promat materials to which it is possible to apply surface mouldings to the face of the door. See page 14 for full details.

PROMADOOR

❶ PROMADOOR: PH1

Configured as a traditional Georgian style six-paneled door, with a glazed vision panel and flat infill panels. Designed and tested as a single leaf, single action doorset only. Glass used within the tested system consists of polished Georgian wire glass, but this can be substituted for a clear glass provided the latter is installed in the approved manner. See page 15 for full details.

❷ PROMADOOR: PH2

Thanks to flush nature of design, appearance of this door can be enhanced by applying surface mounted mouldings, fixed by adhesive and puns etc without detrimental effect to the actual fire performance. However, it is important to note that the use of hardware, ironmongery and other door accessories which might necessitate cutting into the door core could invalidate the fire test certification. See page page 16 for full details.

❸ PROMADOOR: PH3

Tested with the inclusion of surface mounted door closers but to fully conform with the tested system, installations should include surface mounted door closers. Due to its flush nature design, it is possible to enhance the door's appearance with surface mounted mouldings, fixed by adhesive and puns etc without detrimental impact on the actual performance of the fire door. See page page 17 for full details.

❹ PROMADOOR: PMF1 & PMF2

Allows freedom of choice in the use of any type of laminate on the door surface that might be desired. Surface mouldings can also be applied to the face of the door, creating optimum visual impact without affecting the actual fire performance of the door. PMF door systems have been sujected to test with both timber door frame and steel door frame. See page page 18 & 19 for full details.

❺ PROMADOOR: PMHD1

This doorset is constructed entirely of Promat fire resistance materials. As such, it is possible to apply surface mouldings to the face of the door, enhancing visual and aesthetic appearance without affecting tested, tried and proven fire performance. Designers therefore have access to a wide choice of quality and pleasing door finishes. However, it should be clearly noted that ironmongery, door accessories, surrounding structural elements and indeed door finishes must offer same or better fire performance characteristics, benefits and advantages. See page 20 for full details.

❺

❻ PROMADOOR: PS1

This PROMATECT®-S door system is designed for in applications where high levels of high impact resistance are expected, in extreme and aggressive environments, or in areas where doors are routinely exposed to sustained and unusually high levels of wear and tear. Tough and durable PS1 is ideally employed in warehouses, engineering workshops, plant rooms and maintenance areas, and in other strategically important areas that always have to adequately balance high security risks with functional performance and peace of mind. See page 23 for full details.

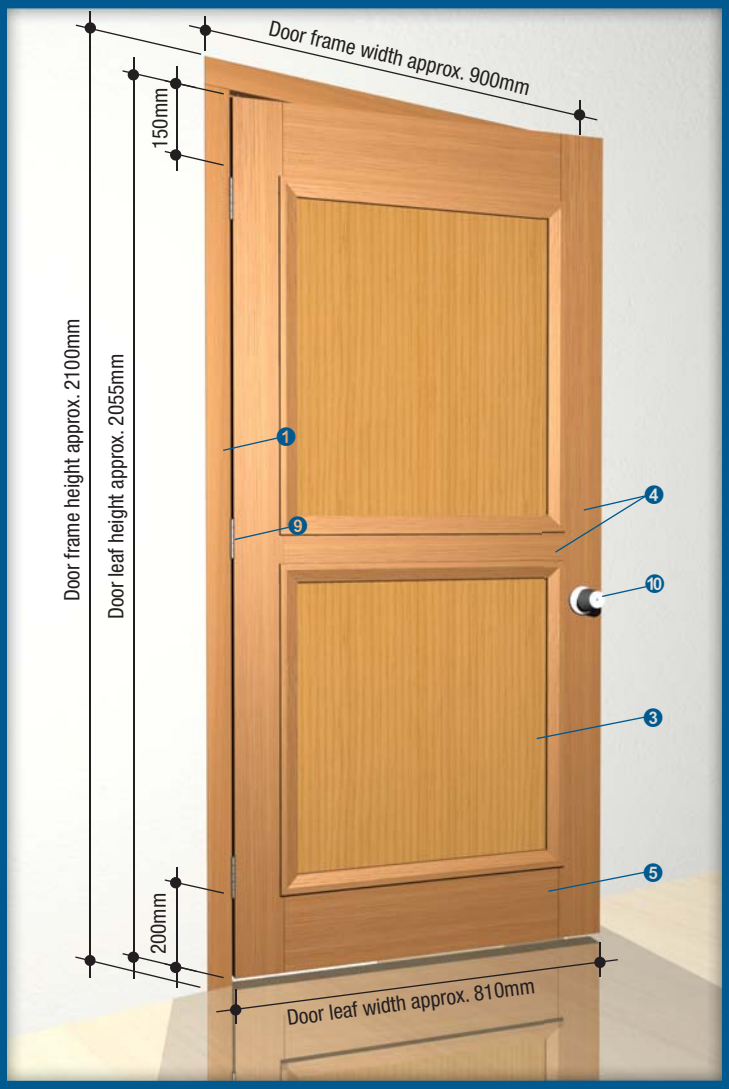
Promat

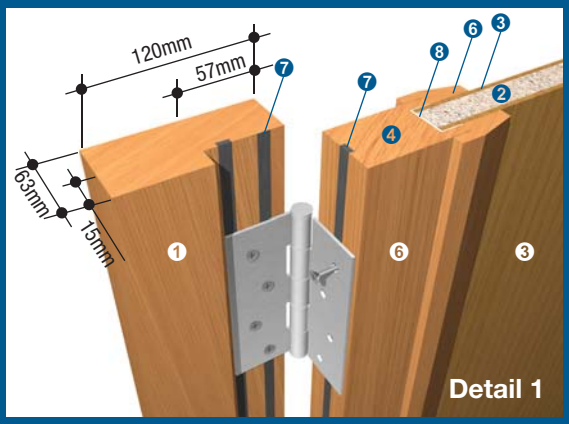
PROMAT Fire Doors & Panels Systems Index

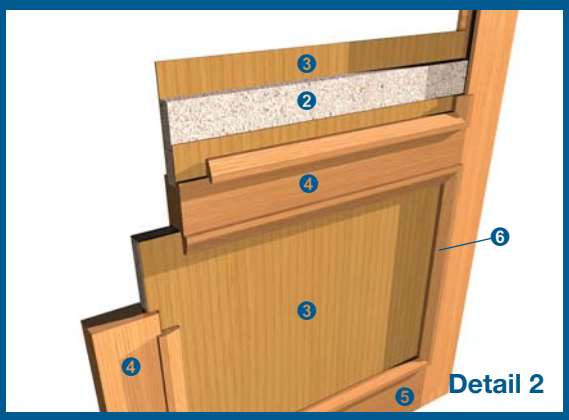
Type of Fire Door	System code	FRL	Door Leaf	Frame included	Tests and assessments standards/labs	Page no.
 VICUDOOR: VD1	**VD 64.60**	-/60/60	2055mm x 810mm	YES	**BS 476: Part 22: 1987** • BFTC 96/09	**13**
 VICUDOOR: VD2	**VD 63.12**	-/120/120	2081m x 903mm x 55mm	YES	**BS 476: Part 22: 1987** • WARRES 63258	**14**
 PROMADOOR: PH1	**PH 64.30**	-/30/30	2055mm x 810mm	YES	**BS 476: Part 22: 1987** • BFTC 95/18	**15**
 PROMADOOR: PH2	**PH 64.60.1**	-/60/60	1950mm x 900mm x 45mm	YES	**BS 476: Part 22: 1987** **IS: 3809: 1979** • CNP 2150	**16**
 PROMADOOR: PH3	**PH 64.60.2**	-/60/60	2040mm x 1490mm x 56mm	YES	**BS 476: Part 22: 1987** • BFTC 95/11	**17**
 PROMADOOR: PMF1	**PMF 64.12**	-/120/120	2045mm x 895mm x 55mm	YES	**BS 476: Part 22: 1987** • CNP 0253	**18**
 PROMADOOR: PMF2	**PMF 63.12**	-/120/120	2100mm x 900mm x 55mm	YES	**BS 476: Part 20 & 22: 1987** **IS: 3614: Part 2: 1992** • 212(1)/FR/2003	**19**

PROMAT Fire Doors & Panels Systems Index

Type of Fire Door	System code	FRL	Door Leaf	Frame included	Tests and assessments standards/labs	Page no.
 PROMADOOR: PMHD 1	**PMHD 63.60**	-/60/60	2365mm x 1133mm x 45mm	YES	**BS 476: Part 22: 1987** • BFTC ASS06/03	**20**
 PROMADOOR: PS1	**PS 63.24**	-/240/240	2362mm x 900mm	YES	**BS 476: Part 22: 1987** • BFTC 99/09A	**23**
 ViCUDOOR Panel: VD3	**VD 116.90**	-/90/90	800mm x 450mm	NO	**BS 476: Part 22: 1987**	**24**
 PROMADOOR Panel: PH4	**PH 116.30** **PH 116.50** **PH 116.60**	-/30/30 -/50/50 -/60/60	800mm x 450mm	NO	**BS 476: Part 22: 1987**	**25**





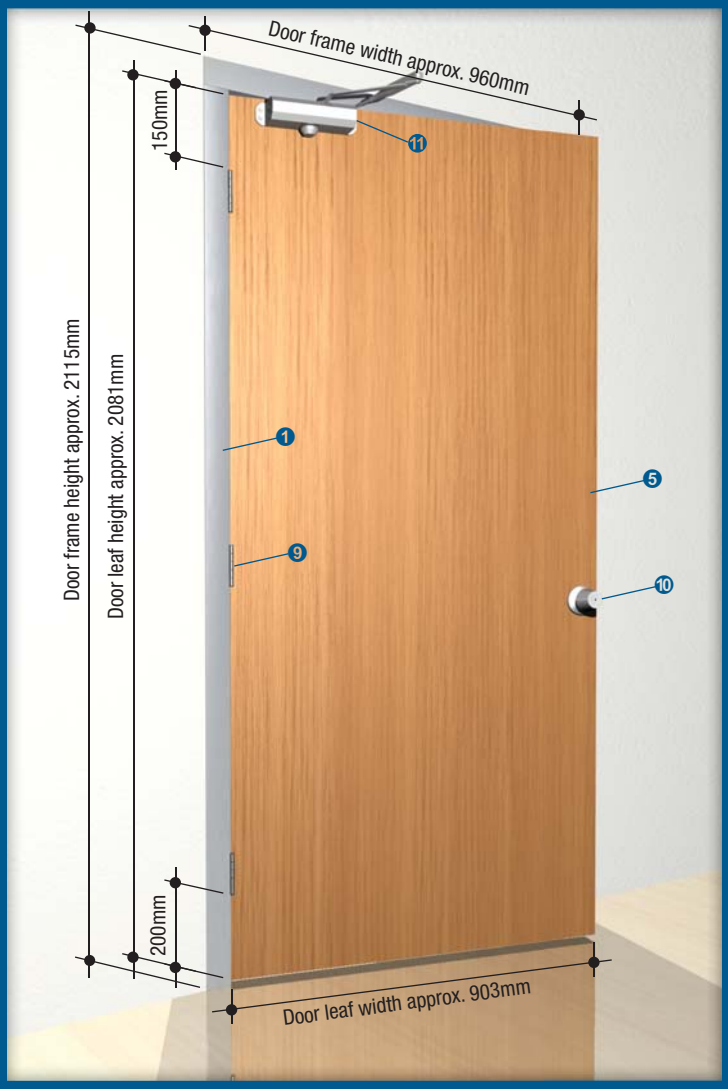


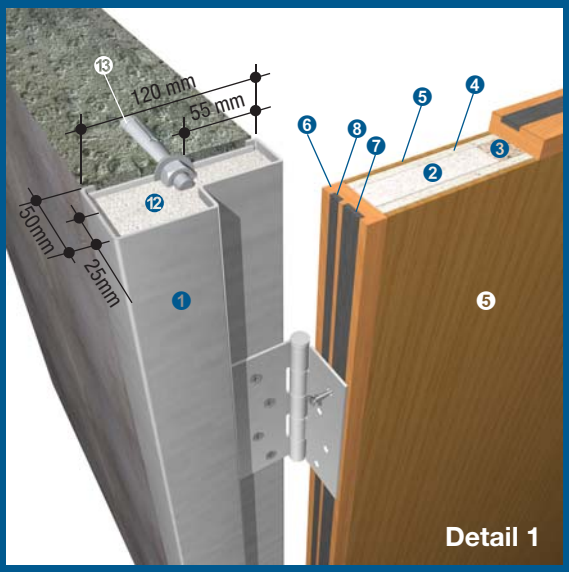
Up to -/60/30 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and BFTC 96/09.

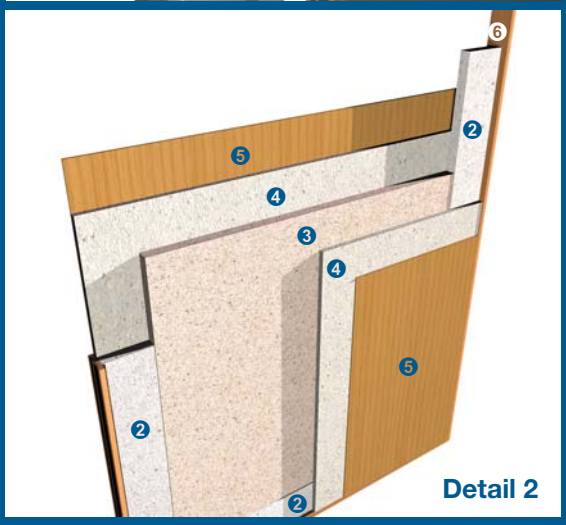
1. Medium meranti wood door frame 120mm x 63mm thick
2. VICUCLAD® core 25mm thick
3. Decorative plywood facing 4mm thick
4. Medium meranti wood top rail, centre transom and door stiles, 120mm wide x 54mm thick
5. Medium meranti wood bottom door rail 200mm wide x 54mm thick
6. Medium meranti wood door beads (alternative moulding can be used if desired)
7. PROMASEAL® LFCSK Intumescent Seal 10mm wide x 2mm thick, fitted at both vertical edges and top side of door
8. PROMASEAL®-A Acrylic Sealant to seal gaps between VICUCLAD® core and door stiles
9. Steel butt hinges 100mm fixed using 38mm screws into door leaf and door frame
10. 3" Union 5 lever mortise lock/latch set with brass knob handles

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Under test, only the latch was used, therefore a standard lockset with dimensions less than item ⑩ can be used with this doorset.



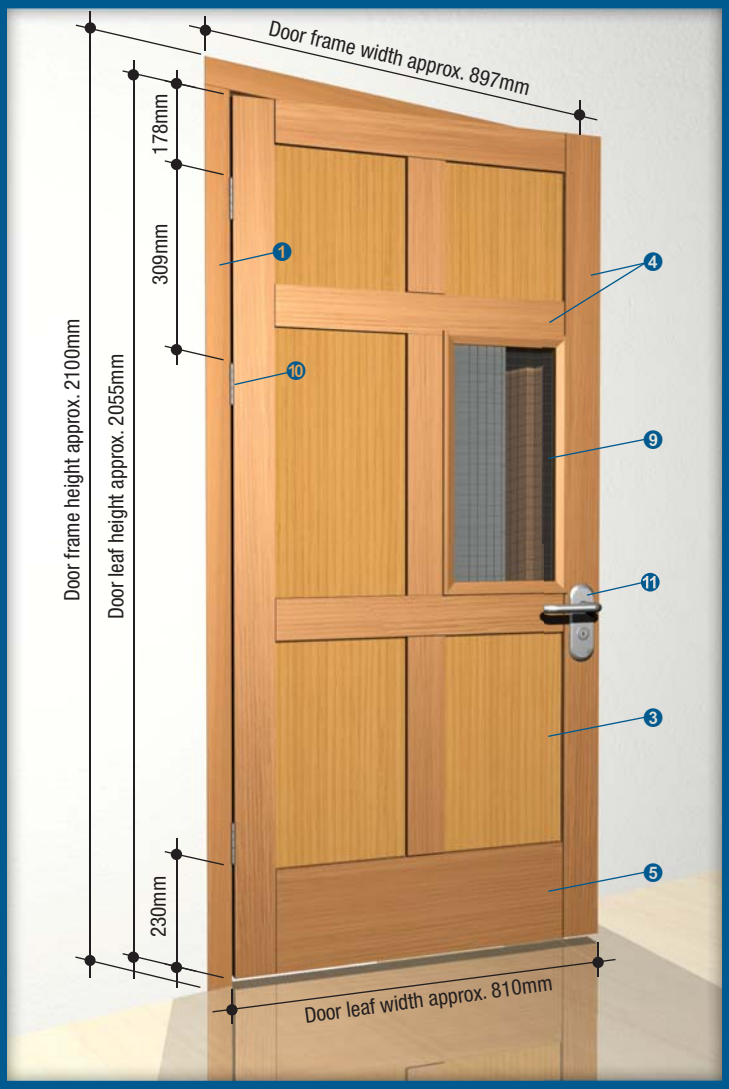


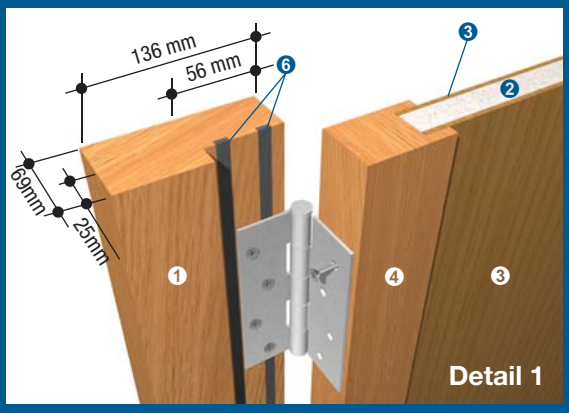


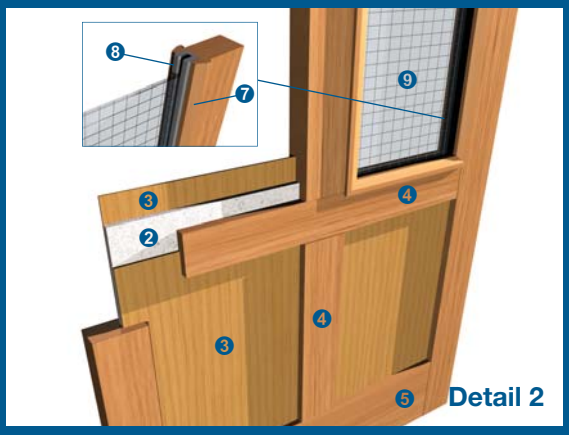
Up to -/120/120 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and WARRES 63258. Insulation applies to door leaf only.

1. Mild steel door frame 120mm x 50mm x 1.6mm thick
2. Perimeter stiles and rails, PROMATECT®-H 100mm wide x 25mm thick
3. VICUCLAD® board core 25mm thick
4. Internal facing of PROMINA®-60 board 12mm thick
5. External facing of plywood 3mm thick
6. Hardwood lippings 55mm x 10mm thick
7. PROMASEAL® LFCSK Intumescent Seal 20mm wide x 2mm thick fitted on all four edges of door leaf
8. PROMASEAL® LFCSK Intumescent Seal 10mm wide x 2mm thick fitted along vertical edges of door
9. Stainless steel butt hinges 102mm x 102mm x 3mm thick
10. Union 3000 stainless steel latch fitted with knobset
11. Union 8573 aluminium overhead door closer
12. Sand or cement mortar infill
13. Frame fixings of nominal 500mm centres

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.





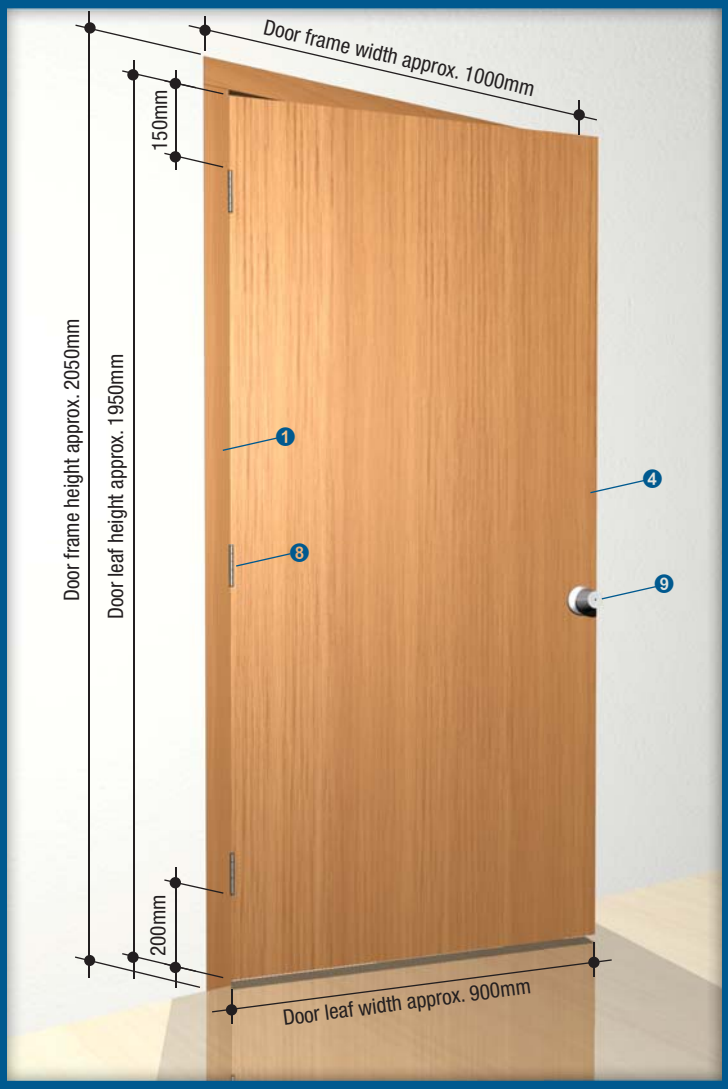


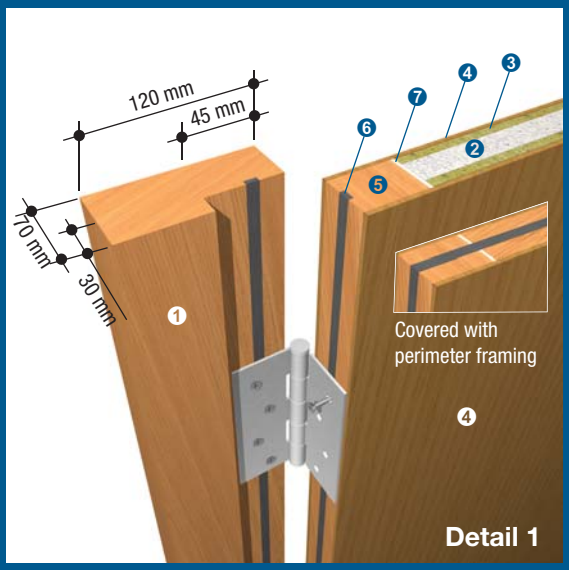
Up to -/30/30 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and BFTC 95/18

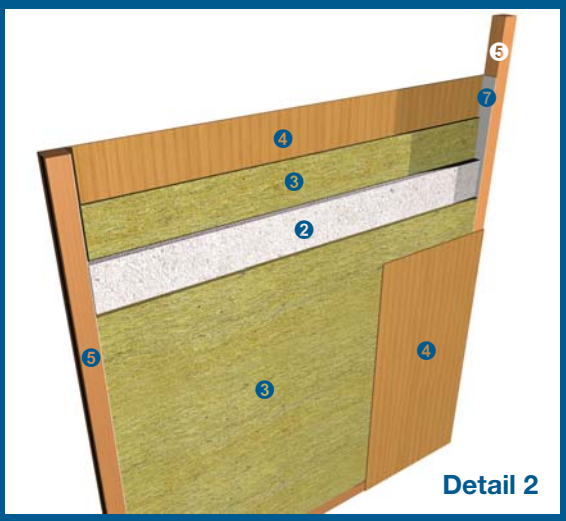
1. Door frame 136mm x 69mm thick of solid meranti wood
2. PROMATECT®-H core 12mm thick
3. Decorative plywood facing 4mm thick bonded to PROMATECT®-H core
4. Top rail, mullions transoms and door stiles 100mm wide x 54mm thick solid meranti wood
5. Bottom door rail 200mm wide x 54mm thick
6. PROMASEAL® LFCSK Intumescent Seal 10mm wide x 2mm thick, fitted along door jambs and perimeter edges of door
7. Glazing beads 38mm x 20mm bonded to door leaf framing
8. Intumescent glazing seal (type of glazing seal is dependent on type of glass installed)
9. Georgian wire glass 6mm thick
10. Steel butt hinge 100mm fixed into door frame and leaf using 38mm No.10 wood screws
11. Union 2.5" mortise latch with aluminium level handles

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Under test, only the latch was used, therefore a standard lockset with dimensions less than item 11 can be used with this doorset.





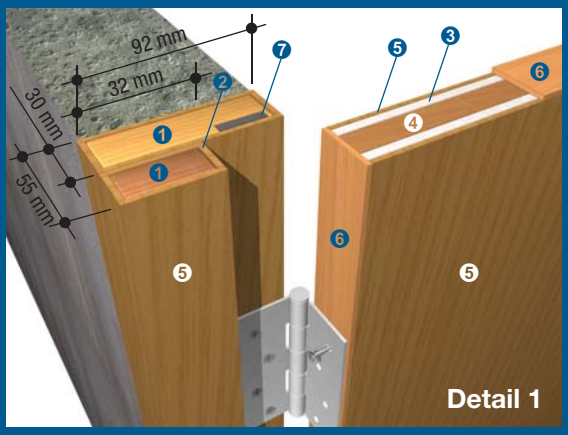


Up to -/60/60 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and IS: 3809: 1979 and CNP-2150

1. MDF door frame 120mm x 70mm thick
2. PROMATECT®-H core 15mm thick
3. M 10mm thick coated with PROMASEAL®-A Acrylic Sealant
4. Plywood 4mm thick with 1mm paint or lamination on both sides
5. Perimeter framing of medium meranti wood 35mm wide x 34mm thick
6. PROMASEAL® LFCSK Intumescent Seal 10mm wide x 2mm thick
7. PROMASEAL®-A Acrylic Sealant to seal gaps between PROMATECT®-H core and door stiles
8. Stainless steel ball bearing hinges 304 grade 100mm x 75mm x 2.5mm
9. Stainless steel latch or L drop

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.

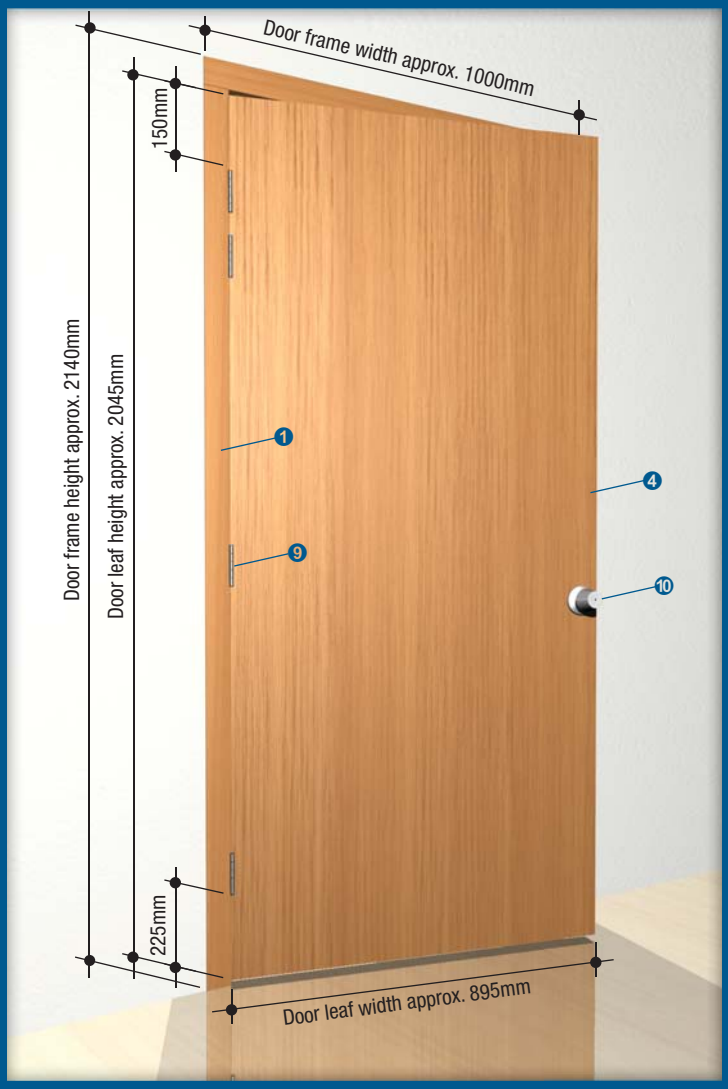


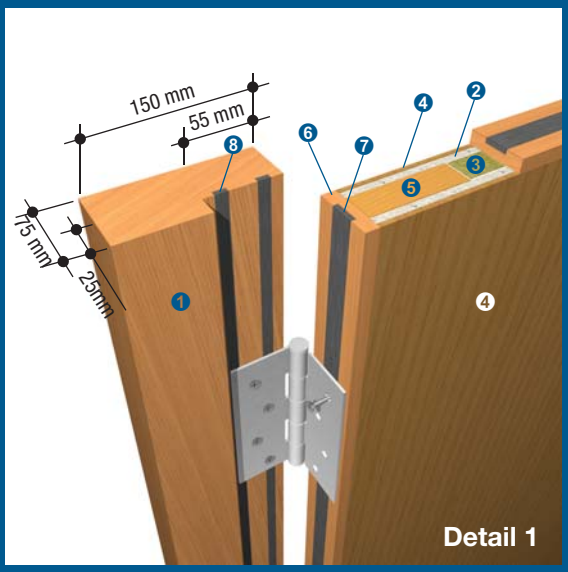
Up to -/60/60 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and BFTC 95/11

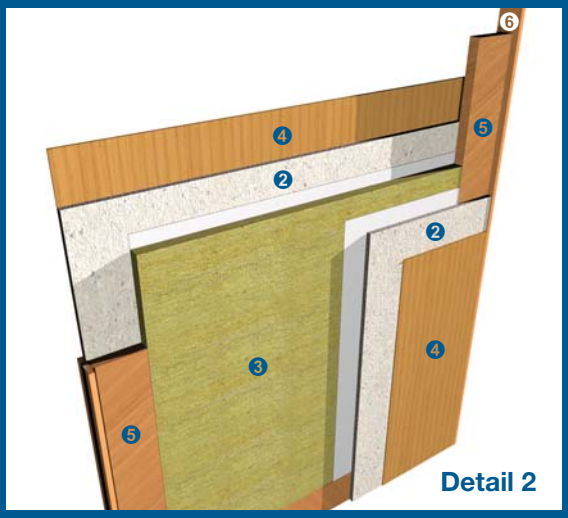
1. Lorient Georgia Pacific Framestock
2. Ash veneer facings 3mm thick
3. PROMATECT®-H board 9mm thick
4. Laminated meranti core 38mm wide x 30mm thick (stiles 50mm wide x 30mm thick and rails 100mm x 30mm thick)
5. Ash veneer facings 4mm thick
6. Ash lippings 3mm thick
7. PROMASEAL® LFCSK Intumescent Seal 20mm wide x 2mm thick
8. PROMASEAL® LFCSK Intumescent Seal 10mm wide x 2mm thick
9. Steel butt hinges 100mm fixed with 38mm No.10 steel wood screws
10. Surface mounted pull handles
11. Briton 1003 aluminium surface mounted door closer

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.





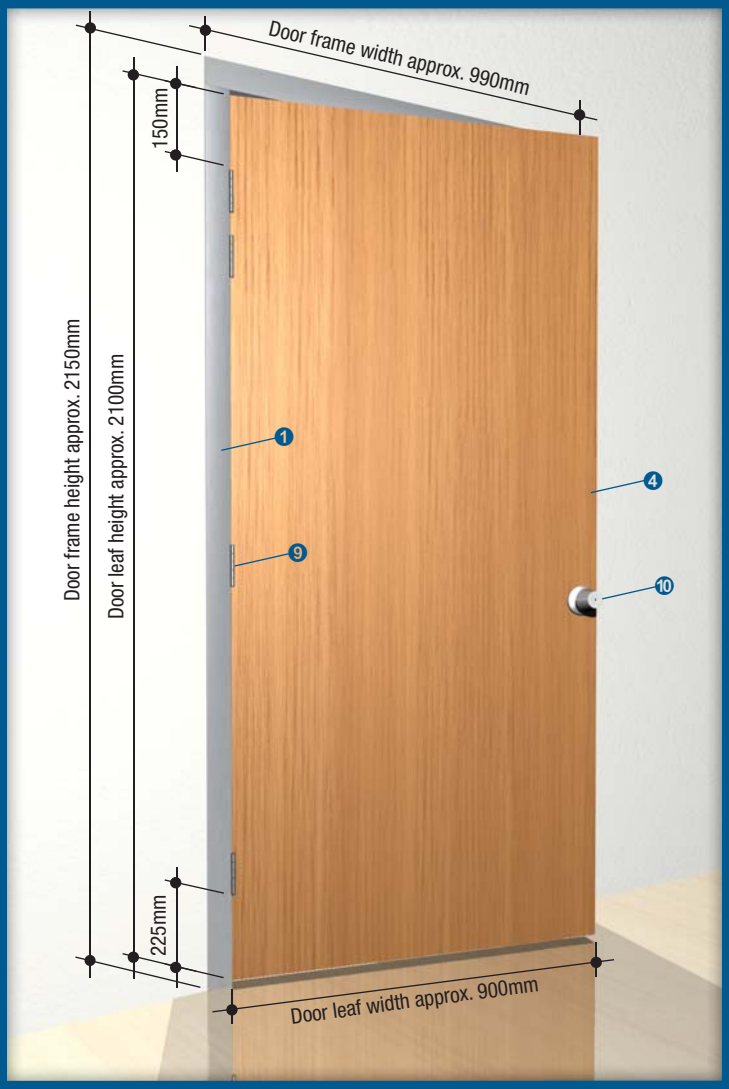


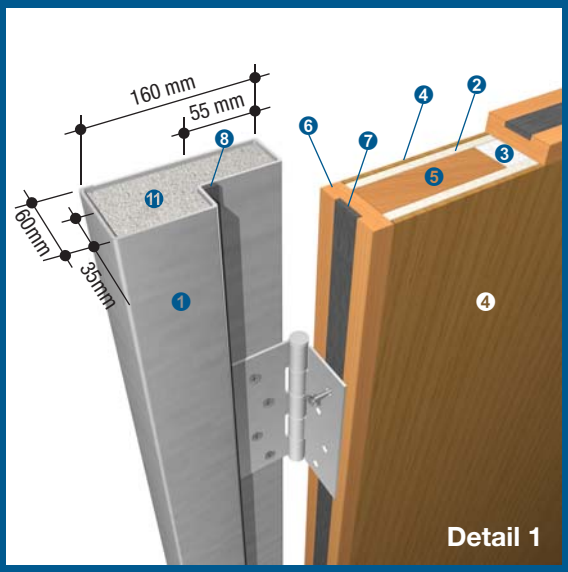
Up to -/120/120 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and CNP-0253

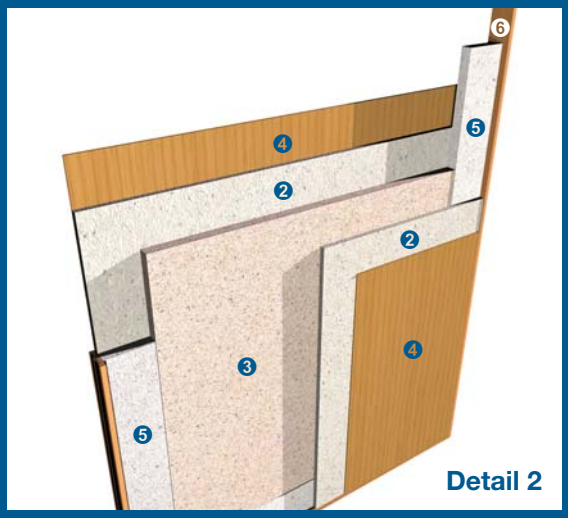
1. Red meranti door frame 150mm x 75mm thick
2. PROMINA®-60 board 9mm thick
3. Mineral wool infill 30mm thick x 96 kg/m^3 with fire rated PROMASEAL® Acrylic Sealant 1mm thick coated on both sides
4. Decorative plywood facing 3mm thick
5. Red meranti hard wood stile and rails to door leaf 100mm x 30mm thick (density ≥ 650 kg/m^3)
6. Teak wood lippings 10mm thick
7. PROMASEAL® LFCSK Intumescent Seal 20mm x 2mm thick on three sides of leaf
8. PROMASEAL® LFCSK Intumescent Seal 10mm x 2mm thick on head and jambs of frame
9. Stainless steel hinges
10. Mortise latch locking system (ME 60 IR)

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.





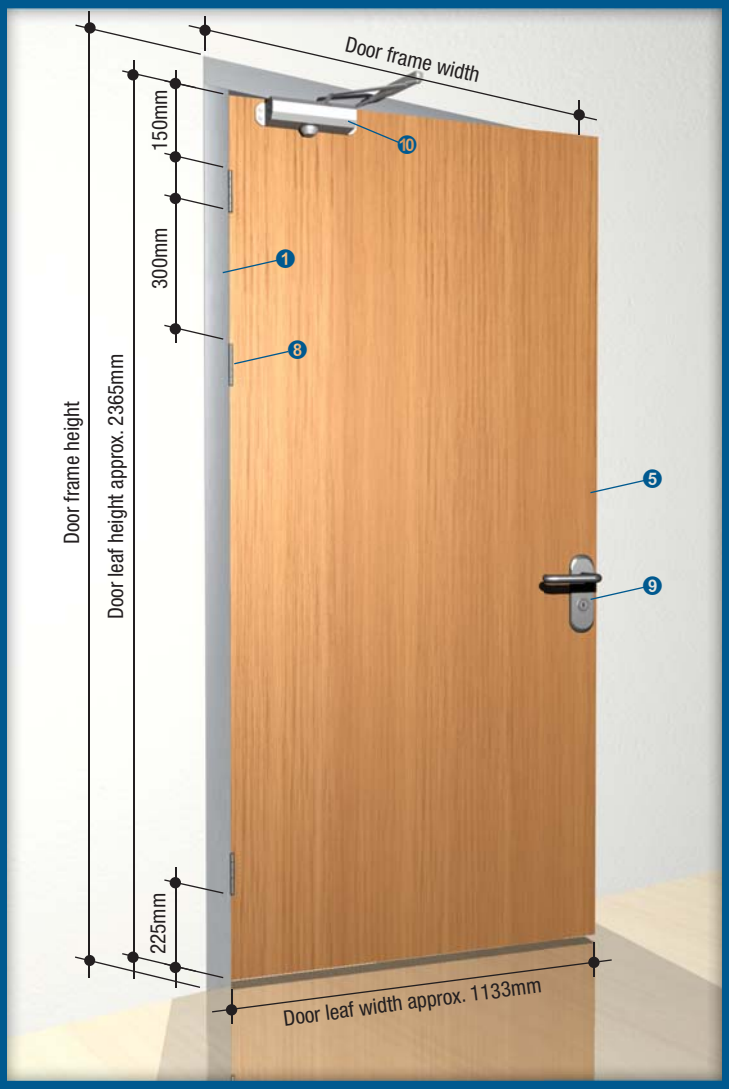


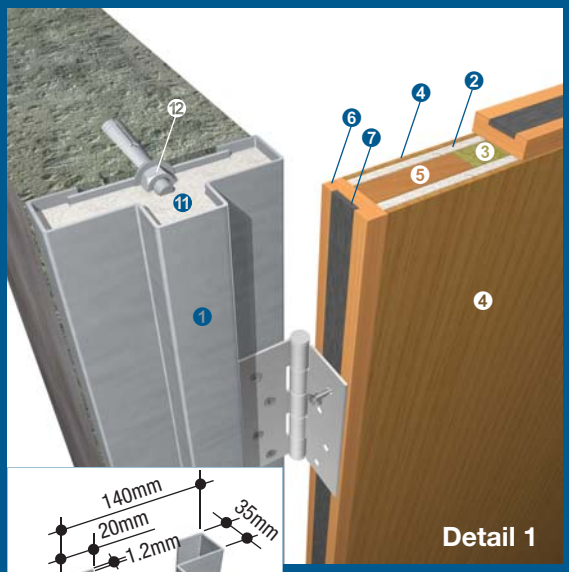
Up to -/120/120 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and Report CBRI 212 (1)/FR/2003

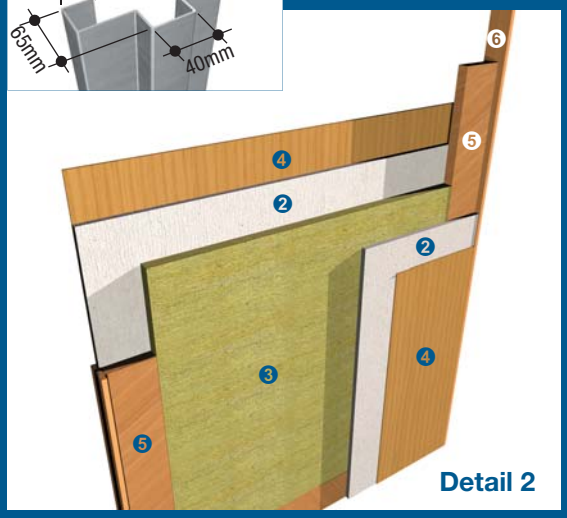
1. Steel door frame 160mm x 60mm x 1.6mm thick
2. PROMINA®-60 board 9mm thick
3. Fire rated insulation ceramic fibre blankets 30mm thick x 96 kg/m^3 with PROMASEAL® Acrylic Sealant 1mm thick on both sides
4. Decorative plywood facing 3mm thick
5. Red meranti hard wood stile and rails to door leaf 100mm x 30mm thick (density ≥ 650 kg/m^3)
6. Teak wood lippings 55mm x 10mm
7. PROMASEAL® LFCSK Intumescent Seal 20mm x 2mm thick on three sides of leaf
8. PROMASEAL® LFCSK Intumescent Seal 10mm x 2mm thick on head and jambs of frame
9. Stainless steel hinges fixed using 35mm x No.8 screws into door leaf and door frame
10. Aluminium knob set
11. Sand or cement mortar infill

Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.





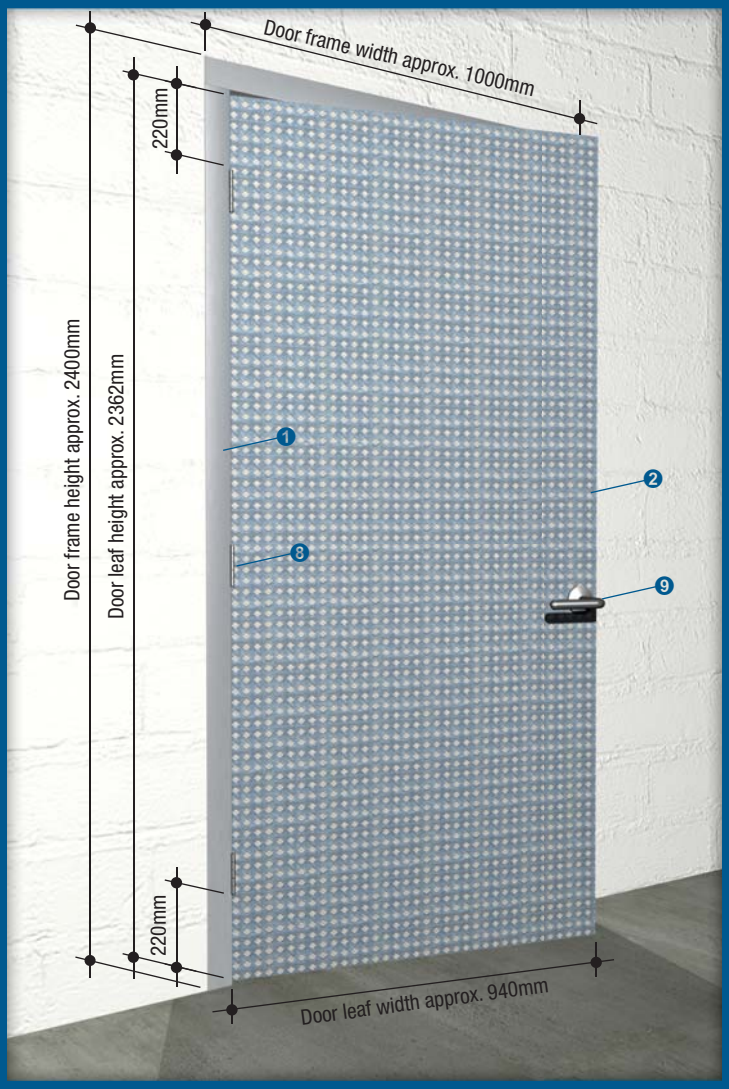


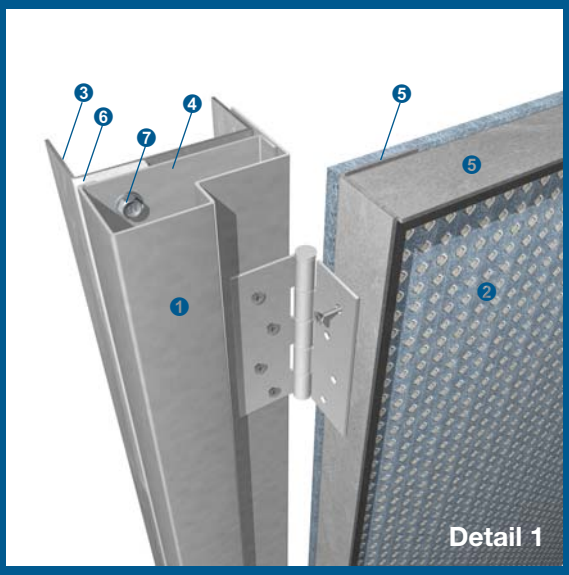
Up to -/60/60 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and BFTC ASS06/03

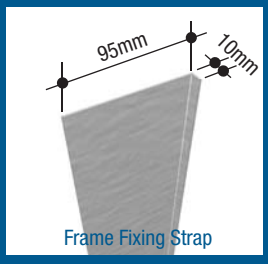
1. Double rebated metal door frame 140mm x 65mm x 1.2mm thick
2. PROMINA®-HD board 6mm thick
3. Mineral wool infill 25mm thick x 80 kg/m^3
4. Decorative plywood facing 3.2mm thick
5. Internal framing 67mm x 26mm thick medium meranti or similar hardwood, nominal 650 kg/m^3 density
6. Hardwood timber lippings 13mm thick fitted on the perimeter of the door leaf
7. PROMASEAL® LFCSK Intumescent Seal 20mm x 2mm thick fitted centrally to grooves within the lipping at both vertical edges and top edge of door leaf
8. Stainless steel hinges of size 127mm X 75mm X 2.5mm
9. Known tested brand door closer
10. Lockset with 70mm backset
11. Sand or cement mortar infill
12. Frame fixings of nominal 500mm centres

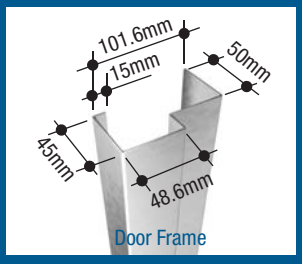
Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.







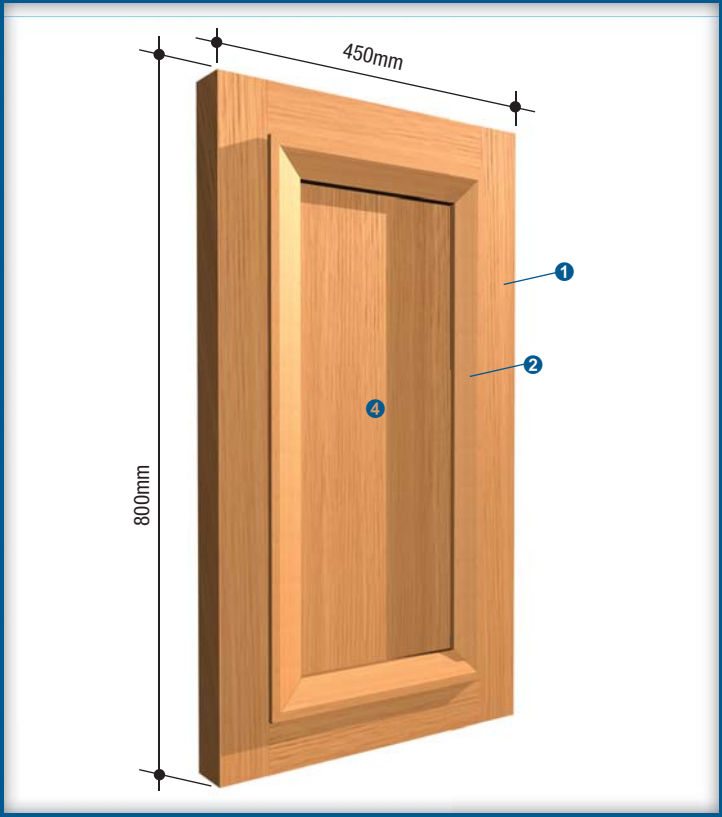


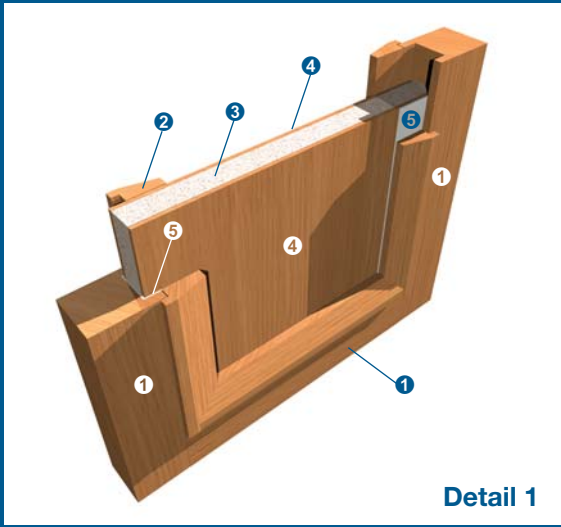
Up to -/240/240 fire resistance in accordance with criteria of BS 476: Part 22: 1987 and BFTC 99/09A

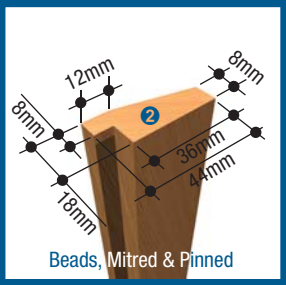
1. Door frame 101.6mm x 50mm x 45mm x 1.6mm thick
2. PROMATECT®-S board 6mm thick
3. 100mm x 50mm x 3mm channel opening frame
4. Frame fixing strap 50mm x 2mm thick welded in position at 500mm centres
5. Steel angle 50mm x 50mm x 5mm
6. PROMASEAL®-A Acrylic Sealant
7. Door jambs fixed to perimeter frame by M10 Bolts at 500mm centres
8. 110mm steel butt hinges fixed to frame and door leaf using 20mm M6 machine screws
9. ASSA 1498 latch and lever handle set

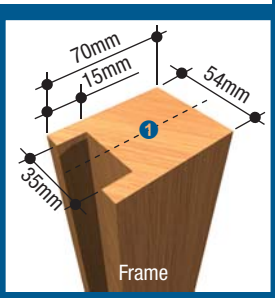
Note: The aperture into which the door is installed should have fire resistance at least equal to that of the doorset itself. Care should be taken to ensure any gaps between the door frame and the aperture are thoroughly sealed to prevent the passage of smoke and hot gases. Please consult Promat Technical Department for details of the PROMASEAL® fire stopping range of products.

Please consult Promat for approved hardware types.





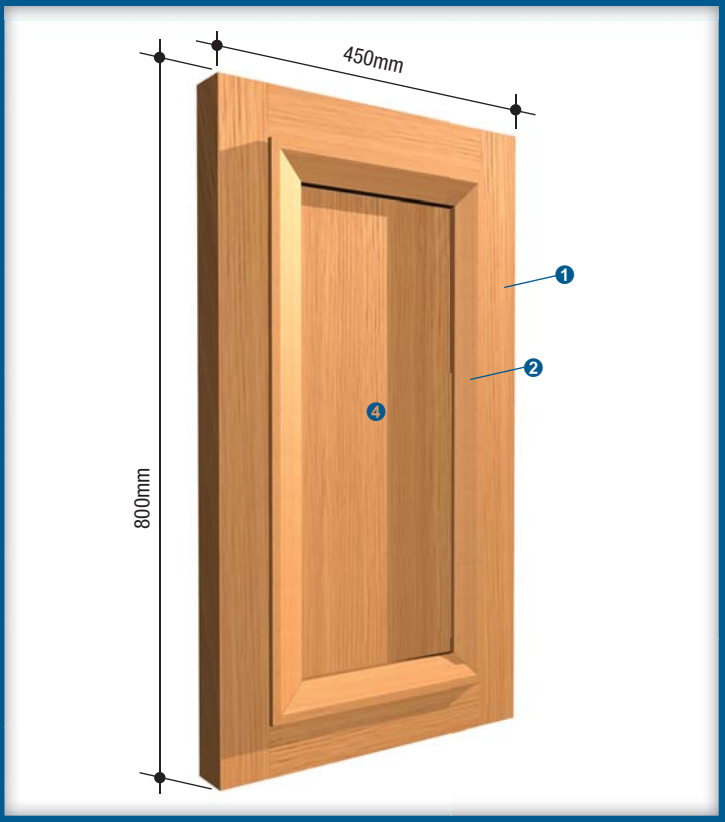


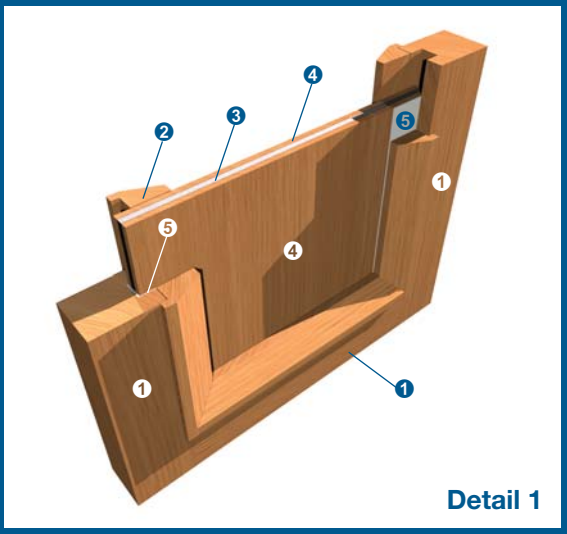


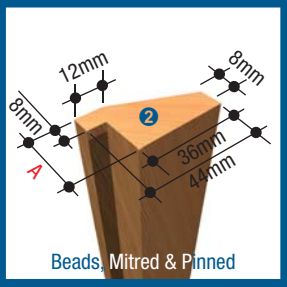
Up to -/90/90 fire resistance in accordance with criteria of BS 476: Part 22: 1987.

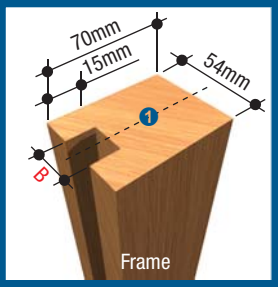
1. **Frame 70mm x 54mm thick, adhesive to all joints in frames**
2. **Beads, mitred and pinned, bedded in intumescent mastic**
3. **VICUCLAD® board 25mm thick**
4. **Birch plywood 4mm thick**
5. **PROMASEAL® AN Acrylic Sealant to seal the gaps between panel and frame**

Note: Door panels have only been fire tested on a small scale, not necessarily as full doorsets. They can nonetheless be incorporated into fire door designs being considered for testing.









Up to -/30/30, -/50/50 and -/60/60 fire resistance in accordance with criteria of BS 476: Part 22: 1987

1. Frame 70mm x 54mm thick, adhesive to all joints in frames
2. Beads, mitred and pinned, bedded in intumescent mastic
3. PROMATECT®-H board 6mm thick
4. Birch plywood 6mm thick
5. PROMASEAL®-A Acrylic Sealant to seal the gaps between panel and frame

To achieve required fire resistance performance, please refer to the following table for related information:

FRL	PROMATECT®-H Thickness	Birch Plywood Thickness	A	B
-/30/30	6mm	6mm	25.5mm	20mm
-/50/50	9mm	9mm	21mm	29mm
-/60/60	12mm	9mm	19mm	32mm

Door panels have only been fire tested on a small scale, not necessarily as full doorsets. They can nonetheless be incorporated into fire door designs being considered for testing.

Construction	FRL	Fixing	Authority
Flush Doors			
 METHOD 1	-/30/-	**Door Thickness**: 34mm **Core**: Honeycomb paper **Facing**: 6mm PROMATECT® H secured with 25mm wood-screws at 300mm centres around the perimeter **Door Seal**: PROMASEAL® LFCSK Intumescent Seal 10mm x 2mm at top and side **Door stop**: 13mm minimum depth	**TRADA FR1026** BRE letters dated Oct.1987 and June 1992
Panelled Doors			
 METHOD 1	-/30/-	**Door Thickness**: 33mm **Panels**: 5mm min **Facing**: 6mm PROMATECT® H secured with 25mm wood-screws at 300mm centres aound the perimeter **Recessed panels**: Infilled with 6mm PROMATECT® H secured with steel panels pins **Door Seal**: PROMASEAL® LFCSK Intumescent Seal 10mm x 2mm at top and side **Door stop**: 13mm minimum depth	**TRADA FR1026** BRE letters dated Oct.1987 and June 1992
 METHOD 2	-/30/-	**Door Thickness**: 33mm **Panels**: 5mm min **Facing**: 6mm PROMATECT® H, both sides are secured with 25mm woodscrews at 300mm centres around the perimeter. **Door Seal**: PROMASEAL® LFCSK Intumescent Seal 10mm x 2mm at top and side **Door stop**: 13mm minimum depth	BRE letters dated Oct.1987 and June 1992

THE ABOVE ARE SUGGESTED GENERAL SOLUTIONS ONLY. PERFORMANCE WILL DEPENDS UPON CONDITION AND TYPE OF DOOR LEAF TO BE UPGRADE. IN ALL INSTANCES PLEASE CONSULT PROMAT FOR SPECIFIC ADVICE RELATED TO THE DOORSET TO BE UPGRADE.

General Description

PROMATECT®-H is a non combustible matrix engineered mineral board reinforced with selected fibres and fillers. It does not contain formaldehyde.

PROMATECT®-H is off-white in colour and has a smooth finish on one face with a sanded reverse face. The board can be left undecorated or easily finished with paints, wallpapers or tiles.

PROMATECT®-H is resistant to the effects of moisture and will not physically deteriorate when used in damp or humid conditions. Performance characteristics are not degraded by age or moisture.

PROMATECT®-H can be produced with bevelled edges for use in partitions and suspended ceilings using a concealed grid system.

A health and safety data sheet is available from Promat and, as with any other material, should be read before working with the board. The board is not classified as a dangerous substance so no special provisions are required regarding the transportation and the disposal of the product to landfill. They can be placed in on-site rubbish skips with other general building waste which should then be disposed by a registered contractor in the appropriate and approved manner.

Typical Mechanical Properties

Modulus of elasticity, E (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	4995 4389
Flexural strength, $F_{rupture}$ (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	10 6
Tensile strength, $T_{rupture}$ (BS 5669: Part 1: 1989)	Longitudinal N/mm² Transverse N/mm²	7.16 4.94
Compressive strength (average, perpendicular on board face) (BS 5669: Part 1: 1989)	N/mm²	11.36

Applications

- Structural steel column and beam cladding
- Concrete or timber column cladding
- Steel/timber stud partitions, solid/frameless partitions
- Conversion of external to internal walls, external walls
- Self-supporting ceilings, suspended ceilings
- Timber floor protection, upgrading of timber floor
- Steel duct cladding, self-supporting ducts
- M&E services enclosure
- Smoke barrier, parapet/spandrel wall
- Access panels and hatches, fire doors
- Tunnel lining, concrete/brick floor and wall upgrading

General Technical Properties

Product generic description		Matrix engineered mineral board
Material class (DIN 4102: Part 1: 1998, BS 476: Part 4: 1970 and AS 1530: Part 1: 1994)		Non combustible
Surface spread of flame	(BS 476: Part 7: 1997) (AS 1530: Part 3: 1989)	Class 1 Class 0,0,0,0
Building regulations classification		Class 0
Nominal density at EMC* (average)	kg/m³	975
Alkalinity (approximate)	pH	12
Thermal conductivity (approximate) at 40°C (ASTM C518: 1991)	W/m°K	0.242
Coefficient of expansion	m/mk	-6.4 x 10^{-6}
Nominal moisture content at EMC*		6%
Thickness tolerance of standard boards	mm	± 0.5
Length x Width tolerance of standard boards	mm	± 5
Surface condition		Front face: smooth Back face: sanded

Thickness (mm)	Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approximate kg/m²)	Weight per pallet (approximate kg)
9	2440 x 1220	61	181.5	8.77	1688
12	2440 x 1220	46	136.9	11.7	1698
15	2440 x 1220	36	107.2	14.6	1662
20	2440 x 1220	27	80.4	19.5	1664
25	2440 x 1220	22	65.4	24.3	1681

*EMC: Equilibrium moisture content. The properties in above tables are mean values given for information and guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat.

PROMATECT®-H is manufactured under a quality management system certified in accordance with ISO 9001: 2008. The product has passed the site audit in accordance with the environmental standards of ISO 14001: 2004 and occupational health and safety requirements of OHSAS 18001: 2007.

AS FOR ALL NATURAL MATERIALS SUCH AS CONCRETE AND CLAY, QUARTZ CAN BE PRESENT AND THIS PRODUCT MAY ALSO RELEASE DUST CONTAINING QUARTZ PARTICLES WHEN IT IS MECHANICALLY MACHINED (CUTTING, SANDING, DRILLING). INHALATION OF HIGH CONCENTRATIONS OF DUST CAN IRRITATE THE RESPIRATORY SYSTEM. DUST CAN ALSO IRRITATE THE EYES AND/OR THE SKIN. THE INHALATION OF QUARTZ CONTAINING DUST, IN PARTICULAR HIGH CONCENTRATIONS OF FINE (RESPIRABLE) DUST OR OVER A PROLONGED PERIOD OF TIME CAN LEAD TO LUNG DISEASE (SILICOSIS) AND AN INCREASED RISK OF LUNG CANCER. AVOID INHALATION OF DUST BY USING MACHINERY WITH DUST EXTRACTION. GUARANTEE ADEQUATE VENTILATION ON THE WORK FLOOR. AVOID CONTACT WITH THE EYES AND SKIN AND AVOID INHALATION OF THE DUST BY WEARING APPROPRIATE PERSONAL PROTECTION GEAR (SAFETY GOGGLES, PROTECTIVE CLOTHING AND DUST MASK). FOR MORE INFORMATION PLEASE CHECK THE APPROPRIATE MATERIAL SAFETY DATA SHEET, AVAILABLE UPON REQUEST.

General Description

PROMINA® 60 is a non combustible matrix engineered mineral board reinforced with selected fibres and fillers. It does not contain formaldehyde.

PROMINA® 60 is beige in colour and has a smooth finish on one face with a sanded reverse face. The board can be left undecorated or easily finished with paints, wallpapers or tiles.

PROMINA® 60 is resistant to the effects of moisture and will not physically deteriorate when used in damp or humid conditions. Performance characteristics are not degraded by age or moisture.

PROMINA® 60 can be produced with bevelled edges for butt jointing purposes.

A health and safety data sheet is available from Promat and, as with any other material, should be read before working with the board. The board is not classified as a dangerous substance so no special provisions are required regarding the transportation and the disposal of the product to landfill. They can be placed in on-site rubbish skips with other general building waste which should then be disposed by a registered contractor in the appropriate and approved manner.

Typical Mechanical Properties

Modulus of elasticity, E (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	4599 3817
Flexural strength, $F_{rupture}$ (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	7.52 5.15
Tensile strength, $T_{rupture}$ (BS 5669: Part 1: 1989)	Longitudinal N/mm² Transverse N/mm²	5.99 5.17
Compressive strength (average, perpendicular on board face) (BS 5669: Part 1: 1989)	N/mm²	7.76

Applications

- Steel/timber stud partitions
- Self-supporting ceilings, suspended ceilings
- M&E services enclosure, riser pipes enclosure
- Smoke barrier, parapet/spandrel wall
- Fire doors

General Technical Properties

Product generic description		Matrix engineered mineral board
Material class (DIN 4102: Part 1: 1998, BS 476: Part 4: 1970 and AS 1530: Part 1: 1994)		Non combustible
Surface spread of flame	(BS 476: Part 7: 1997) (AS 1530: Part 3: 1989)	Class 1 Class 0,0,0,0
Building regulations classification		Class 0
Nominal density at EMC* (average)	kg/m³	1000
Alkalinity (approximate)	pH	9
Thermal conductivity (approximate) at 40°C (ASTM C518: 1991)	W/m°K	0.136
Coefficient of expansion	m/mk	-7.5 x 10^{-6}
Nominal moisture content at EMC*		8%
Thickness tolerance of standard boards	mm	- 0.5, +1
Length x Width tolerance of standard boards	mm	± 5
Surface condition		Front face: smooth Back face: sanded

Thickness (mm)	Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approximate kg/m²)	Weight per pallet (approximate kg)
6	2440 x 1220	90	267	6	1730
9	2440 x 1220	61	181	9	1760
12	2440 x 1220	46	137	12	1775
15	2440 x 1220	36	107	15	1733

*EMC: Equilibrium moisture content. The properties in above tables are mean values given for information and guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat.

PROMINA® 60 is manufactured under a quality management system certified in accordance with ISO 9001: 2008. The product has passed the site audit in accordance with the environmental standards of ISO 14001: 2004 and occupational health and safety requirements of OHSAS 18001: 2007.

AS WITH MOST BUILDING PRODUCTS, THIS PRODUCT CONTAINS QUARTZ. MECHANICAL MACHINING (CUTTING, SANDING, DRILLING) OF BUILDING PRODUCTS WILL RELEASE DUST WHICH MAY CONTAIN QUARTZ PARTICLES. HOWEVER, FOR THIS PRODUCT, WITH EXPOSURE ASSESSMENTS PERFORMED BY ACCREDITED EUROPEAN LABORATORIES USING REFERENCE WORKPLACE MONITORING METHODS, ANY QUARTZ LEVELS IN THE RESPIRABLE DUST WERE BELOW THE DETECTION LIMITS. INHALATION OF HIGH CONCENTRATIONS OF DUST MAY IRRITATE THE RESPIRATORY SYSTEM. DUST MAY ALSO CAUSE IRRITATION OF THE EYES AND/OR SKIN. INHALATION OF RESPIRABLE DUST CONTAINING QUARTZ, IN HIGH CONCENTRATIONS OR OVER PROLONGED PERIODS OF TIME CAN LEAD TO LUNG DISEASE (SILICOSIS) AND AN INCREASED RISK OF LUNG CANCER. AVOID INHALATION OF DUST BY USING MACHINERY WITH DUST EXTRACTION. GUARANTEE ADEQUATE VENTILATION ON THE WORK FLOOR. AVOID CONTACT WITH THE EYES AND SKIN AND AVOID INHALATION OF DUST BY WEARING APPROPRIATE PERSONAL PROTECTION GEAR (SAFETY GOGGLES, PROTECTIVE CLOTHING AND DUST MASK). FOR MORE INFORMATION PLEASE CHECK THE APPROPRIATE MATERIAL SAFETY DATA SHEET, AVAILABLE UPON REQUEST.

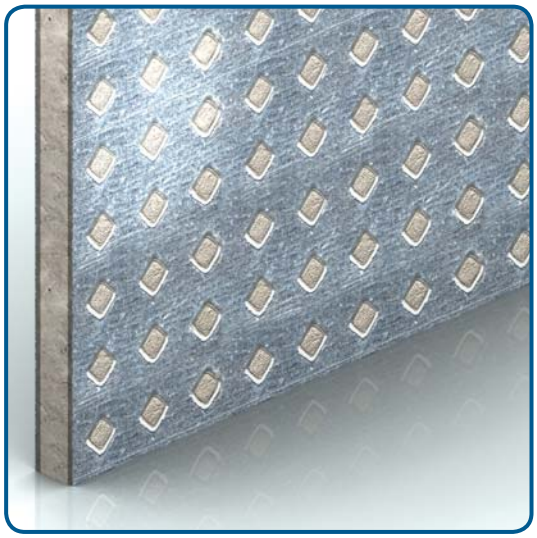
General Description

PROMATECT®-S is a composite board manufactured with a fibre reinforced cement core, with outer facings of 0.5mm perforated galvanised steel mechanically bonded to each surface of the core. Other steel finishes such as stainless steel are also available for use where greater resistance to corrosion is required.

PROMATECT®-S systems combine lightness, strength, impact resistance and durability with exceptional fire resistance. These systems remain resistant to firefighter hoses leaving the board capable of performing their function should fire services be required to withdraw before a fire is extinguished.

PROMATECT®-S systems have been used successfully for many years, including rail and metro projects, military facilities and in commercial, pharmaceutical and petrochemical plants.

A health and safety data sheet is available from Promat and, as with any other material, should be read before working with the board. The board is not classified as a dangerous substance so no special provisions are required regarding the transportation and the disposal of the product to landfill. They can be placed in on-site rubbish skips with other general building waste which should then be disposed by a registered contractor in the appropriate and approved manner.



Typical Mechanical Properties

Thickness	mm	6	9.5
Modulus of elasticity, E	UDL G/Pa	414	199
Flexural strength, $F_{rupture}$	UDL G/Pa (N/mm²)	333	351
Impact strength (BS 5669: Part 1: 1989)	N/m	> 980	> 580

Applications

- Structural steel protection
- Steel stud partitions
- Self-supporting ceilings, suspended ceilings
- Cladding to steel ducts, self-supporting ducts
- M&E services enclosure
- Smoke and fire barrier, parapet/spandrel wall
- Access panels and hatches, fire doors

General Technical Properties

Thickness	mm	6	9.5
Product generic description		Cement and steel composite board	Cement and steel composite board
Material class (ISO 1182: 2002, BS 476: Part 4: 1970 and AS 1530: Part 1: 1994)		Non combustible	Non combustible
Surface spread of flame (BS 476: Part 7: 1997)		Class 1	Class 1
Building regulations classification		Class 0	Class 0
Nominal density at EMC* (average)	kg/m³	2470	2280
Thermal conductivity (approximate) at 40°C (ASTM C518: 1991)	W/m°K	0.179	0.179
Nominal moisture content at EMC*		7%	8%
Water absorption capacity (average)	g/cm³	5.73	4.77
Thickness tolerance of standard boards	mm	- 1, + 2	- 1 + 1.5
Length x Width tolerance of standard boards	mm	± 5	± 5
Surface condition		Galvanised steel with fibre cement core	Galvanised steel with fibre cement core

Thickness (mm)	Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approximate kg/m²)	Weight per pallet (approximate kg)
6	2500 x 1200	30	90	14	1350
9.5	2500 x 1200	25	75	20	1575

*EMC: Equilibrium moisture content. The properties in above tables are mean values given for information and guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat.

PROMATECT®-S is manufactured under a quality management system certified in accordance with ISO 9001: 2008. The product has passed the site audit in accordance with the environmental standards of ISO 14001: 2004 and occupational health and safety requirements of OHSAS 18001: 2007.

AS WITH MOST BUILDING PRODUCTS, THIS PRODUCT CONTAINS QUARTZ. MECHANICAL MACHINING (CUTTING, SANDING, DRILLING) OF BUILDING PRODUCTS WILL RELEASE DUST WHICH MAY CONTAIN QUARTZ PARTICLES. HOWEVER, FOR THIS PRODUCT, WITH EXPOSURE ASSESSMENTS PERFORMED BY ACCREDITED EUROPEAN LABORATORIES USING REFERENCE WORKPLACE MONITORING METHODS, ANY QUARTZ LEVELS IN THE RESPIRABLE DUST WERE BELOW THE DETECTION LIMITS. INHALATION OF HIGH CONCENTRATIONS OF DUST MAY IRRITATE THE RESPIRATORY SYSTEM. DUST MAY ALSO CAUSE IRRITATION OF THE EYES AND/OR SKIN. INHALATION OF RESPIRABLE DUST CONTAINING QUARTZ, IN HIGH CONCENTRATIONS OR OVER PROLONGED PERIODS OF TIME CAN LEAD TO LUNG DISEASE (SILICOSIS) AND AN INCREASED RISK OF LUNG CANCER. AVOID INHALATION OF DUST BY USING MACHINERY WITH DUST EXTRACTION. GUARANTEE ADEQUATE VENTILATION ON THE WORK FLOOR. AVOID CONTACT WITH THE EYES AND SKIN AND AVOID INHALATION OF DUST BY WEARING APPROPRIATE PERSONAL PROTECTION GEAR (SAFETY GOGGLES, PROTECTIVE CLOTHING AND DUST MASK). FOR MORE INFORMATION PLEASE CHECK THE APPROPRIATE MATERIAL SAFETY DATA SHEET, AVAILABLE UPON REQUEST.

General Description

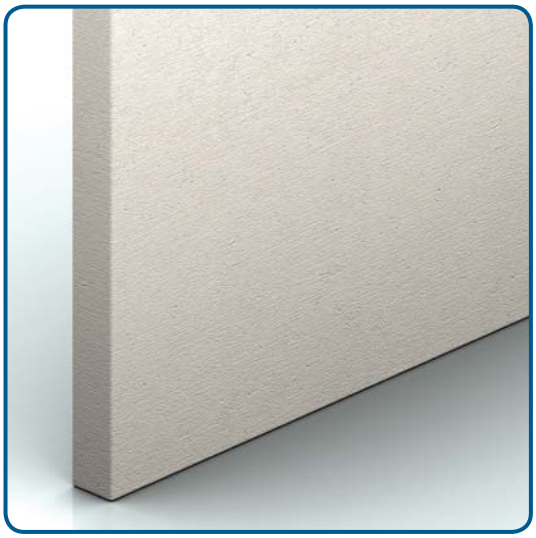
PROMINA®-HD is a non combustible fibre silicate board manufactured from a homogeneous mixture of Portland cement with selected fibres and fillers. It does not contain formaldehyde.

PROMINA®-HD is off-white in colour and has a smooth finish on one face with a dimple pattern on the reverse face. The architectural appeal of the board surface is ready for most forms of decoration.

PROMINA®-HD is resistant to the effects of moisture and will not physically deteriorate when used in damp or humid conditions. Performance characteristics are not degraded by age or moisture.

PROMINA®-HD is suitable for both internal and external applications. It is also designed to withstand the most demanding exposure conditions experienced in external applications as well as being hard wearing, impact and abrasion resistant.

A health and safety data sheet is available from Promat and, as with any other material, should be read before working with the board. The board is not classified as a dangerous substance so no special provisions are required regarding the transportation and the disposal of the product to landfill. They can be placed in on-site rubbish skips with other general building waste which should then be disposed by a registered contractor in the appropriate and approved manner.



Typical Mechanical Properties

Modulus of elasticity, E (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	11.04 10.80
Flexural strength, $F_{rupture}$ (BS EN 310: 1993)	Longitudinal N/mm² Transverse N/mm²	13 10
Tensile strength, $T_{rupture}$ (ASTM D1037: 1978)	Longitudinal N/mm² Transverse N/mm²	7.7 5
Compressive strength (average, perpendicular on board face) (BS 5669: Part 1: 1989)	N/mm²	21.14

Applications

- External wall cladding/lining, external wall infill panel
- Acoustic wall lining
- Eaves, fascia and soffit linings
- Eave, fascia and soffit linings
- Internal partition and ceiling linings
- Backing panel for wet and tiled areas
- Thermal insulation infill panel
- Fire doors

General Technical Properties

Product generic description		Fibre silicate board
Material class (BS 476: Part 4: 1970 and AS 1530: Part 1: 1994)		Non combustible
Surface spread of flame (BS 476: Part 7: 1997 and AS 1530: Part 3: 1989)		Class 1
Building regulations classification		Class 0
Nominal density at EMC* (average)	kg/m³	1300
Alkalinity (approximate)	pH	10
Thermal conductivity (approximate) at 40°C (ASTM C518: 1991)	W/m°K	0.187
Water absorption capacity (average)	g/cm³	19
Nominal moisture content at EMC*		6%
Thickness tolerance of standard boards	mm	- 0.5, + 0.75
Length x Width tolerance of standard boards	mm	± 2
Surface condition		Front face: smooth Back face: dimple pattern

Thickness (mm)	Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approximate kg/m²)	Weight per pallet (approximate kg)
4.5	2440 x 1220	120	357	5.85	2213
6	2440 x 1220	90	268	7.80	2214
7.5	2440 x 1220	72	214	9.75	2213
9	2440 x 1220	61	181.5	11.7	2252
12	2440 x 1220	46	136.9	15.6	2264
15	2440 x 1220	36	107.2	19.5	2216
20	2440 x 1220	27	80.4	26.0	2215

*EMC: Equilibrium moisture content. The properties in above tables are mean values given for information and guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat.

PROMINA®-HD is manufactured under a quality management system certified in accordance with ISO 9001: 2008. The product has passed the site audit in accordance with the environmental standards of ISO 14001: 2004 and occupational health and safety requirements of OHSAS 18001: 2007.

AS FOR ALL NATURAL MATERIALS SUCH AS CONCRETE AND CLAY, QUARTZ CAN BE PRESENT AND THIS PRODUCT MAY ALSO RELEASE DUST CONTAINING QUARTZ PARTICLES WHEN IT IS MECHANICALLY MACHINED (CUTTING, SANDING, DRILLING). INHALATION OF HIGH CONCENTRATIONS OF DUST CAN IRRITATE THE RESPIRATORY SYSTEM. DUST CAN ALSO IRRITATE THE EYES AND/OR THE SKIN. THE INHALATION OF QUARTZ CONTAINING DUST, IN PARTICULAR HIGH CONCENTRATIONS OF FINE (RESPIRABLE) DUST OR OVER A PROLONGED PERIOD OF TIME CAN LEAD TO LUNG DISEASE (SILICOSIS) AND AN INCREASED RISK OF LUNG CANCER. AVOID INHALATION OF DUST BY USING MACHINERY WITH DUST EXTRACTION. GUARANTEE ADEQUATE VENTILATION ON THE WORK FLOOR. AVOID CONTACT WITH THE EYES AND SKIN AND AVOID INHALATION OF THE DUST BY WEARING APPROPRIATE PERSONAL PROTECTION GEAR (SAFETY GOGGLES, PROTECTIVE CLOTHING AND DUST MASK). FOR MORE INFORMATION PLEASE CHECK THE APPROPRIATE MATERIAL SAFETY DATA SHEET, AVAILABLE UPON REQUEST.

General Description

VICUCLAD® is a non combustible board in which the unique cellular structure of vermiculite is maintained and controlled by a pre treatment process. This gives excellent thermal insulation properties with dimensional stability at high temperatures. VICUCLAD® is used extensively for the fire protection of structural steel elements in buildings to provide up to 240 minutes fire protection. It may also be used to protect sheet metal ducts and for the construction of smoke extract ducts, e.g. VICUVENT®.

VICUCLAD® is available in two grades:

- 900R with thicknesses from 18mm to 40mm suitable for up to 180 minute fire resistance
- 1050R with thicknesses from 45mm to 80mm suitable for up to 240 minute fire resistance.

VICUBOND® WR is a ready-to-use, one part non combustible cement for fixing VICUCLAD® and VICUTUBE® boards. It may also be used for gap filling.

VICUBOND® WR is delivered in semi-liquid form in 10 litre drums. For VICUCLAD®, allow one litre for each 1.5m² of 25mm boards.

A health and safety data sheet is available from Promat and, as with any other material, should be read before working with the board. The board is not classified as a dangerous substance so no special provisions are required regarding the transportation and the disposal of the product to landfill. They can be placed in on-site rubbish skips with other general building waste which should then be disposed by a registered contractor in the appropriate and approved manner.

Typical Mechanical Properties

Flexural strength, $F_{rupture}$ (BS EN 310: 1993)	N/mm²	0.8
Compressive strength (average, perpendicular on board face) (BS 5669: Part 1: 1989)	N/mm²	0.95

Applications

- Structural steel column and beam cladding
- Riser pipes enclosure
- Smoke barrier, parapet/spandrel wall
- Access panels, fire doors

General Technical Properties

Product generic description		Vermiculite board
Material class (BS 476: Part 4: 1970)		Non combustible
Surface spread of flame (BS 476: Part 7: 1997)		Class 1
Building regulations classification		Class 0
Nominal density at EMC* (average)	kg/m³	405
Thermal conductivity (approximate) at 20°C (ASTM C518: 1991)	W/m°K	0.16
Coefficient of expansion	m/mk	16 x 10^{-6}
Length x Width tolerance of standard boards	mm	- 0, +10
Surface condition		Smooth, oatmeal texture and colour

Thick-ness (mm)	**Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approx. kg/m²)	Weight per pallet (approx. kg)
18	1000 x 610	216	132	7.92	1045
20	1000 x 610	200	122	8.60	1045
25	1000 x 610	160	97	10.12	982
30	1000 x 610	132	80	11.85	949
35	1000 x 610	114	69	13.47	930
40	1000 x 610	96	58	15	870
45	1000 x 610	88	53	16.87	895

Thick-ness (mm)	**Standard dimensions (mm x mm)	Number of boards per pallet	Surface per pallet (m²/pallet)	Weight per m² of sheet (approx. kg/m²)	Weight per pallet (approx. kg)
50	1000 x 610	80	48	18.25	876
55	1000 x 610	72	43	19.52	840
60	1000 x 610	64	39	21	819
65	1000 x 610	60	36	22.75	819
70	1000 x 610	56	34	24.5	833
75	1000 x 610	52	31	26.25	814
80	1000 x 610	48	29	28	812

*EMC: Equilibrium moisture content. **Other sizes are available upon request.

The properties in above tables are mean values given for information and guidance only. If certain properties are critical for a particular application, it is advisable to consult Promat. Please note, the density of VICUCLAD® decreases as the thickness of the board increases. The above figures are nominal weights for reference and guidance purposes only. Please consult Promat for information concerning the specific weight of any particular thickness for any application.

VICUCLAD® is manufactured under a quality management system certified in accordance with ISO 9001: 2008.

WHEN MACHINING THIS PRODUCT, AIRBORNE DUST MAY BE RELEASED, WHICH MAY BE HAZARDOUS TO HEALTH. DO NOT INHALE THE DUST. AVOID CONTACT WITH SKIN AND EYES. USE DUST EXTRACTION EQUIPMENT. RESPECT REGULATORY OCCUPATIONAL EXPOSURE LIMITS FOR TOTAL INHALABLE AND RESPIRABLE DUST. FOR MORE INFORMATION PLEASE CHECK THE APPROPRIATE MATERIAL SAFETY DATA SHEET, AVAILABLE UPON REQUEST.

General Description

PROMASEAL®LFCSK is a halogen-free, graphite based innovative intumescent material. PROMASEAL®LFCSK produced by extrusion technology. The expanded PROMASEAL®LFCSK intumescent strip creates a stable, hard fire resistant char preventing spread of fire, smoke and hot gases.

In comparison to other intumescent products, PROMASEAL®LFCSK is characterised by the following:

- Highly efficient sealing material for joints and gaps preventing the spread of fire, smoke and hot gases
- For sealing timber doors, glass doors and gates as well as for the production of fire resistant partition walls
- For sealing penetrations such as dampers, cable and pipe penetrations

The width of the PROMASEAL®LFCSK Intumescent Strip used as a sealing strip depends on the construction of the joint to be sealed.

Properties

Surface characteristics	Surface can be laminated with films, e.g. PVC, wood decor, aluminium
Age resistant	Non-ageing and weatherproof (10 years)
Environmental conditions	Resistant to water and atmospheric factors (light, heat, frost, UV-radiation)
No unnecessary additives	Free of organic solvents
Architectural finishes	Can be varnished with acrylic paints, chlorinated rubber paints, 2-component epoxy-resin paints, silicones etc.

Applications

- Cutting with standard cutting tools
- Recommended working temperature: Approx. 20°C
- Must be and applied on dry surfaces, free of grease and dust

Storage

- Store in a cool, dry place with temperatures between 10°C and 35°C.

General Technical Properties

Colour	Anthracite grey
Consistency	Solid, flexible
Density	1150 kg/m³ ± 200 kg/m³
Thickness	1.8 mm. ± 0.3 mm. + adhesive raw
Reaction to fire (DIN 4102)	Classification B2
Expansion temperature	Start at approx. 190°C
Expansion volume	10 times (550°C loaded) 19 times (550°C not loaded)
Expansion pressure	0, MPa (300°C)
UV resistance	Excellent
Heat conductivity	1.2 W/mK (unexpanded)
Humidity characteristics	Insoluble in water

Standard Dimensions

Width (mm)	Length (m)
10	25 and 50
15	100
19	100
20	100
25	100
27	100
30	100
34	100
40	100
50	100
Other sizes available with minimum order of 25,000> 30,000 linear feet	

Safety Measures

- Keep out of reach of children
- Avoid contact with food
- For further information, please refer to the relevant Promat material safety data sheet

General Description

PROMASEAL®-A Acrylic Sealant (SA-A) is a gun applicator sealant designed for sealing of joints and services penetrations against the spread of fire, smoke and hot gases for up to 240 minutes fire resistance when tested to AS 1530: Part 4, AS 4072: Part 1 and BS 476: Part 20. In addition, PROMASEAL®-A Acrylic Sealant may be used as acoustic sealant due to its density and flexibility.

PROMASEAL®-A Acrylic Sealant should be used in conjunction with all penetration sealing systems to provide a secure cold smoke seal. Where the location of a fire is some distance from a penetration seal, there will be insufficient heat to activate an intumescent material. As such, cool smoke can rapidly pass through buildings, creating a toxic, life-threatening environment.

While the use of a cold smoke seal is not needed for meeting fire resistance performance requirements, it should be considered a necessity to prevent smoke movement through buildings via penetrations. It is therefore highly recommended.

Properties

- Good movement capability
- Tack-free
- Fire tested up to 240 minutes (integrity)
- Will not slump
- Halogen free
- Suitable for joints up to 50mm wide
- Flexible
- Good adhesion to most building products
- Can be overpainted (Intumescent Acrylic Sealant only)
- Suitable for internal and semi-exposed applications

Applications

- Sealing small gaps and holes in applications requiring up to 240 minutes fire resistance
- Suitable for most applications but Promat PROMASEAL® Silicone Sealant would be required for service temperatures over 70°C or where increased joint movement capability needed.

Storage

- Store in a cool, dry place

General Technical Properties

Sealant base	Water-based acrylic sealant
Cure system	Water loss
Skin over time (23°C, 50%RH)	Minimum 15 minutes
Overpaint times	48 hours
Application temperature range	+5 to +30°C
Service temperature range	-20 to +70°C
Joint movement capability	± 20%
Slump	Nil at joints up to 28mm
Elongation at break	N/A
Shelf life when stored between 5°C to 30°C	12 months

Packaging

Wooden crate (2150 x 900 mm)	300ml cartridges
Carton box (1075 x 900mm)	600ml foil packs.
Linear meter per cartridge	310 / Joint width (mm) x Joint depth (mm)

Safety Measures

- Keep out of reach of children
- Avoid contact with food
- For further information, please refer to the relevant Promat material safety data sheet

General Description

PROMASEAL® Bulkhead Sealer is comprised of mineral fillers, acrylic polymer, water and other additives. It is an especially formulated fire retardant coat that acts as a fire barrier, sealing openings in walls, floors and door systems.

PROMASEAL® Bulkhead Sealer works together with a substrate - such as high density mineral rockwool slab - to provide required fire resistance levels. It is the simplest of all fire stopping product to use, and certainly one of the most economical.

PROMASEAL® Bulkhead Sealer System has been tested successfully in a timber door system for up to 60 minutes fire resistance in accordance with the criteria of BS 476: Part 22: 1987. The tested system consists of one layer of coated battens sandwiched with PROMAT® board, glued and nailed to timber framework. The same components can be assembled in reverse order.

Properties

- Fire tested up to 120 minutes (integrity)
- Act as a fire barrier to seal off openings in walls or floors thus preventing the passage of fire
- Flexible
- Suitable for internal applications
- Can either precoated off site or finished post on site installation

Applications

- Sealing opening in applications requiring up to 120 minutes fire resistance
- Floor/wall/door openings should have fire resistance higher or equal to the installed system

Storage

- Store in cool, dry, well ventilated area, away from oxidising agents, acids and food.

General Technical Properties

Coating base	Liquid-based sealer
Cure system	Water loss
Skin over time (23°C, 50%RH)	Minimum 15 minutes
Overpaint times	48 hours
Application temperature range	+5 to +30°C
Service temperature range	-20 to +70°C
Joint movement capability	± 12.5%
Slump	Nil at joints up to 28mm
Elongation at break	N/A
Shelf life when stored between 5°C to 30°C	12 months

Packing

Bucket	5kg or as precoated batts measuring 1200mm x 600mm.

Safety Measures

- Keep out of reach of children
- Avoid contact with food
- For further information, please refer to the relevant Promat material safety data sheet

Promat

For latest information of the Promat Asia Pacific organisation, please refer to www.promat-ap.com.

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