Promat

PROMASEAL® Mortar
Various Penetration Seals

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etex building performance

PROMASEAL® Mortar is a lightweight, fire resistant, cement based product, supplied as a pre-mixed, grey powder to which water is added. It has been tested up to a 240 minute fire resistance with various penetration seals in concrete/masonry floors and walls (with an equal or greater fire resistance level).

Advantages of PROMASEAL® Mortar include:

- Clean and economical.
- The mortar weighs approximately 700kg per m^3 as compared to 2400kg per m^3 of normal concrete and 1600-1800kg per m^3 of lightweight concrete. This means that the formwork required is equally lightweight and simple for the mortar to install.
- Convenient for carriage in a few bags with just a bucket of water even on a large project site and for storage up to several hours in buckets with an air tight lid. Thus installers only need to do a number of small openings without having to repeat and consume time in preparing the mix at the site.
- Quick setting time in a few hours depending on ambient weather conditions.
- Easy to create new holes for installation of new penetrating services and equally easy to repair.
- Does not shrink on drying. For walls, if the opening is too large to be sealed, the void may need to be filled up to 90%. Let set for one hour, then fill remainder of void as the wet mortar slumping is under its own weight. This is not applicable in floors.
- Can be installed at the last minute before inspection time or after all services are installed.
- Comparatively more versatile and flexible to install, and more compatible with other Promat fire stopping systems.
- PROMASEAL® Mortar can provide a fully insulated system, depending on type and dimension of the penetrating services. Please consult Promat for details.

Applications that have been tested in floors or walls (with an equal or greater fire resistance level) are:

- Electrical cables in bundles or supported with steel cable trays through floors or walls.
- Steel and copper pipes up to 200mm nominal diameter in floors and up to 100mm in walls.
- Plastic pipes with non combustible mineral wool insulation in floors and walls.
- Hot and chilled water pipes with combustible insulation in floors (used in conjunction with PROMASEAL® FlexiWrap) and walls.
- Electrical busbars and busways in floors.
- uPVC electrical conduits in floors (used in conjunction with PROMASEAL® Conduit Collar).
- Telecommunication cables in floors and walls.

General application considerations

It is important that the user be aware of the type of penetrating services and the dimensions of the gaps that will be left around the services that are to be sealed. Valid supporting evidence that the proposal consists of a tested system may be required. This may vary from country to country; depending upon the way the test results are interpreted and how local regulations are applied.

Please consult Promat for more information.

Basic handling procedures

Mixing

PROMASEAL® Mortar is packed in bags, and is blended ready for mixing with water. When mixed with 12 to 16 litres of water, 20kg of the powder will produce approximately 35 litres of mix, this is sufficient to fill an area approximately $0.35m^2$ at 100mm thickness (or 0.6m x 0.6m of clear opening).

For a dry "packing" mix, add PROMASEAL® Mortar to 10 litres of water.

For a medium mix, add PROMASEAL® Mortar to 12 litres of water.

For a wet "pourable" mix, add PROMASEAL® Mortar to 16 litres of water.

This equates to approximately 3 x 20kg bags of PROMASEAL® Mortar per $1m^2$ of clear opening at 100mm thickness or approximately 30 bags per m^3.

PROMASEAL® Mortar can be mixed to a consistency to suit the application. If services are close together and difficult to access, it may be necessary to make a wet "pourable" mix. If however the PROMASEAL® Mortar can be easily installed, make a medium mix. If the mortar has to be stacked in a wall opening, make a dry "packing" mix.

To assess such a dry mix, add sufficient water to create a mix that will, when squeezed, assume the shape and form of hand but will easily brush off without leaving hand wet (similar to damp sand on a beach, for example).

Bond breakers to metal pipes

For some types of installation it may be necessary to allow for movement of services that pass through the seal, e.g. metal hot water pipes.

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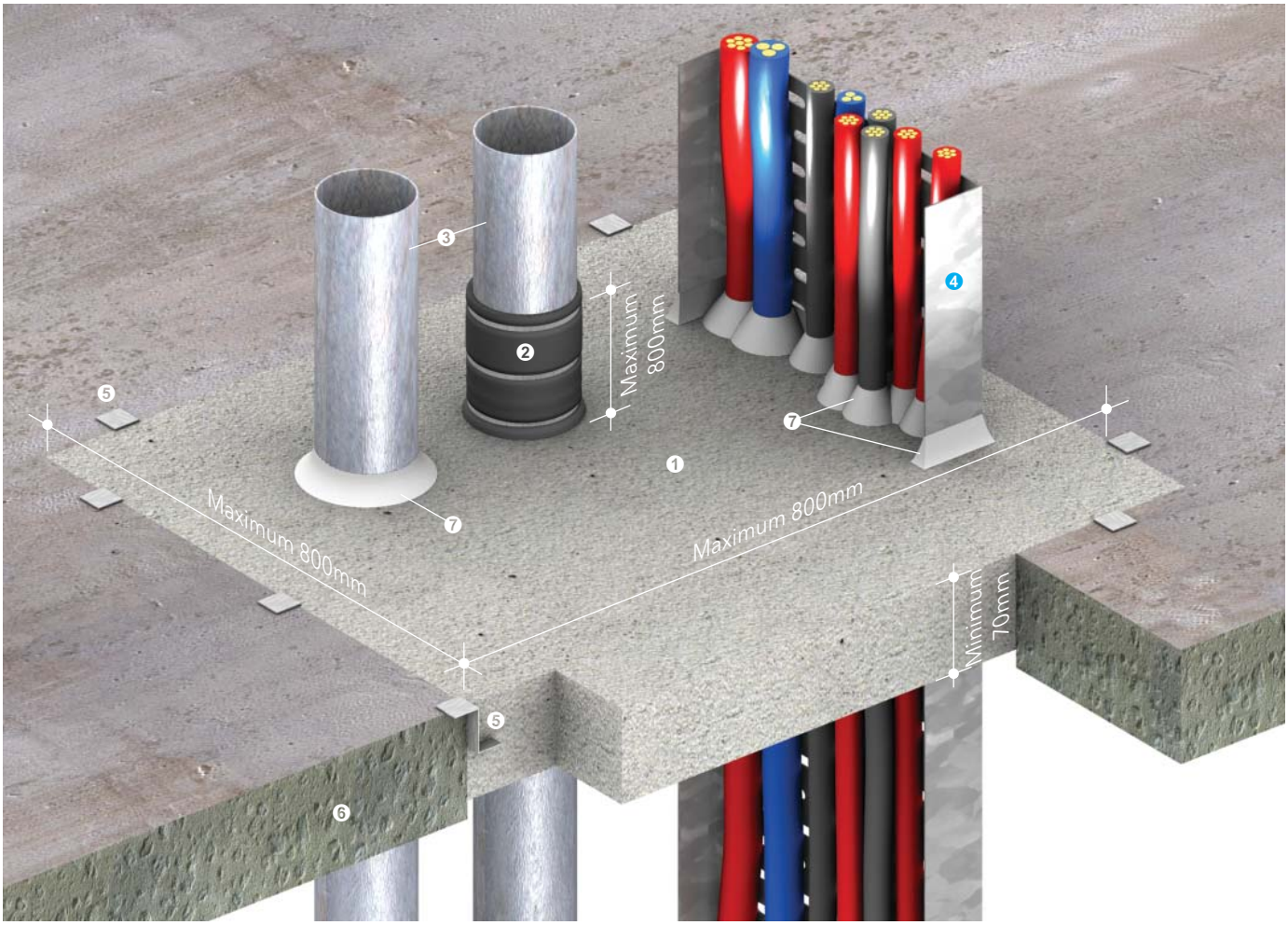


Up to -/240/240 fire resistance in accordance with the requirements of BS 476: Part 20: 1987, BS EN 1366: Part 3: 2009 and/or AS 1530: Part 4: 2014, depending on applications and types of penetrating elements; insulation time is the measured time to insulation failure on surface of the PROMASEAL® Mortar

In some instances, where insulation measured upon the penetrating elements is the required criteria, this time to insulation failure can be substantially shorter, e.g. metal pipes penetrating the floors. If insulation measured upon the penetrating elements is a specified performance criteria, please consult Promat about the use of PROMASEAL® Wrap

1. **PROMASEAL® Mortar**
2. **PROMASEAL® Wrap or PROMASEAL® SupaWrap**
3. **Non combustible metal pipes**
4. **Electrical cables supported with cable tray or steel trunking**
5. **Steel Z-clips 25mm wide at nominal 300mm centres**
6. **Fire resistant concrete/masonry floors**
7. **All joints and contact points caulked with PROMASEAL®-A Acrylic Sealant**

A bond breaker will then be required between the PROMASEAL® Mortar and the pipe. This can be achieved using a strip of 100mm x 10mm thick PROMASEAL® IBS™ wrapped around the pipe.

Sealing with PROMASEAL®-A Acrylic Sealant

Where cables penetrate the seal it may be necessary to apply sealant between the cables to ensure all gaps are sealed against the passage of fire and hot or cold smoke.

Where metal pipes penetrate the seal it is recommended that a fillet of PROMASEAL®-A Acrylic Sealant is applied around the pipe on the unexposed face to give a smoke and water seal at this point. This is not necessary to achieve the fire resistance, although is advisable to ensure the system can provide a seal against the passage of cold smoke.

Formwork

Types of formwork

Virtually any type of material can be used as formwork, e.g high density mineral wool, polystyrene, timber etc.

Formwork does not necessarily have to be removed after installation. In the event of a fire the formwork becomes sacrificial. However, if formwork is constructed from a material such as PU foam, it is advisable to remove the formwork once the mortar is cured to reduce hazards of flammability and toxic smoke production.

The following list of formwork types are suggestions only, the material to be used for formwork will depend on size of the openings, type and configuration of the penetrating services:

- Plasterboard
- PROMATECT®-H, PROMATECT®-L, PROMATECT® 50 or PROMATECT® 100 board
- Medium and high density mineral/rock wool
- Polystyrene foam approximately 50mm thick depending upon the span (for use around cables please check the compatibility with the cable jacket material)
- Timber (e.g. plywood or MDF board)
- Sheet metal

Installing formwork

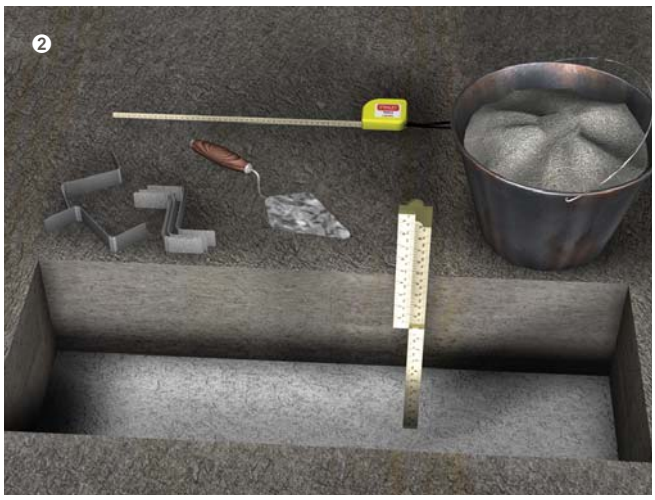
Where access is possible, formwork can be fixed to the soffit of a floor or to the face of a wall. Ensure that the formwork is secure and supported where necessary.

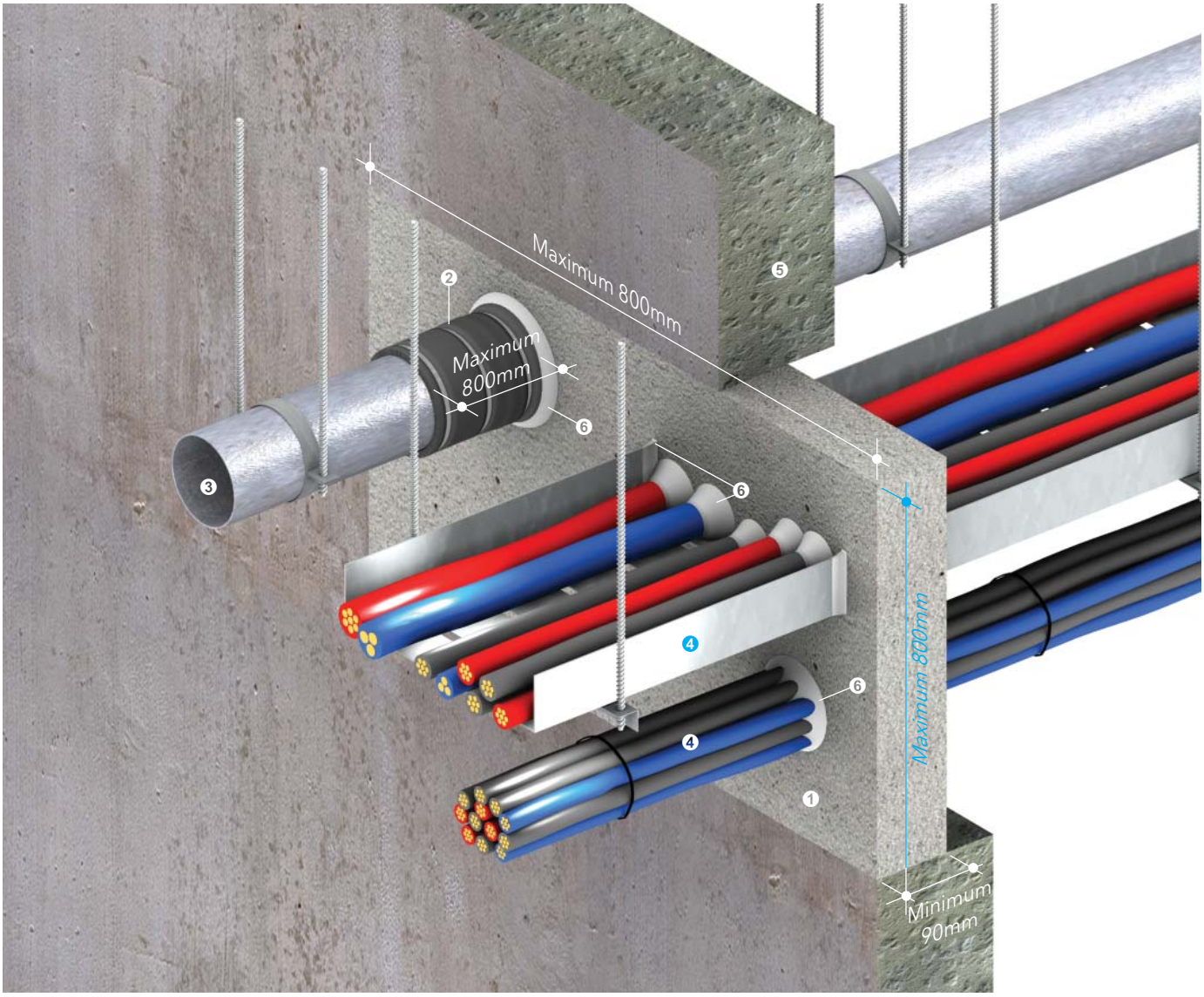
If working from above a floor, the formwork can be placed from the top and supported on a steel angle fixed to the inside edge of the floor. The angle does not need to be continuous. Use sufficient to support the formwork.

Alternatively, soft forms of formwork, e.g. mineral fibre battens, can be simply friction fitted into place. It is important to ensure the formwork is installed at the correct height to allow the the correct depth (105mm) of PROMASEAL® Mortar to be installed. Once the mortar is fully cured the formwork is sacrificial.

Sealing formwork

All gaps around the perimeter or the services should be sealed to prevent wet slurry seeping through to the other side. This can be carried out using PROMASEAL®-A Acrylic Sealant or by placing a dry mix of mortar over the gaps.





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❶ PROMASEAL® Mortar

❷ PROMASEAL® Wrap or PROMASEAL® SupaWrap

❸ Non combustible metal pipes with appropriate support

❹ Electrical cables supported with or without supporting cable tray/steel trunking

❺ Fire resistant concrete/masonry walls

❻ All joints and contact points caulked with PROMASEAL®-A Acrylic Sealant

Formwork

Steel Z-clips

Install 25mm wide x 0.5mm thick steel Z-clips and/or angle brackets. These are critical to ensure and effective key into existing concrete/masonry floors. In certain situations (generally where a cable tray is adjacent to a vertical wall as shown on opposite page), the clips are only required on three sides of the opening. The clips from the PROMASTOP® UniCollar package are suitable for use in this application'

An alternate method to applying steel Z-clips is to use a mechanical interlock where holes are drilled into the existing concrete element which meets the new PROMASEAL® Mortar, so that the fresh mortar can flow into that and key it back to the surrounding element.

Every application may need a slightly different approach and solution. The following are basic guidelines only.

PROMASEAL® Mortar is non loadbearing. It is advisable to place a visible warning sign near all barriers to identify its characteristics/ inherent properties, with wording similar as follows:

> WARNING: THIS IS A FIRE RESISTANT BARRIER. DO NOT DISTURB. DO NOT WALK OR PLACE ANY LOADS ON OR AGAINST THE BARRIER. IF THE BARRIER IS DAMAGED CONTACT ..... (name of installer) IMMEDIATELY.

Installation

Penetration seals in concrete/masonry floors

1) Depth of PROMASEAL® Mortar required

For floors a minimum 105mm thick PROMASEAL® Mortar is required for fire resistance performance up to 240 minutes and 70mm thick PROMASEAL® Mortar for up to 120 minutes.

The insulation measured on the individual penetrating services may have lesser fire resistance level. Please consult Promat for more information.

2) Cored holes

If the gap around any service is small, it may be possible to simply force a foam backing rod or styrene foam into place to act as formwork and then install the mortar.

It is advisable to seal around services with a fillet of PROMASEAL®-A Acrylic Sealant to act as a barrier against the passage of smoke and water leakage in floors. This sealant is not required to meet fire performance requirements.

PROMASEAL® Pillows are normally a better option for this type of penetration. Please refer to Promat for details.

3) Openings in service risers

Generally such openings have only three sides and are adjacent to a continuous vertical wall.

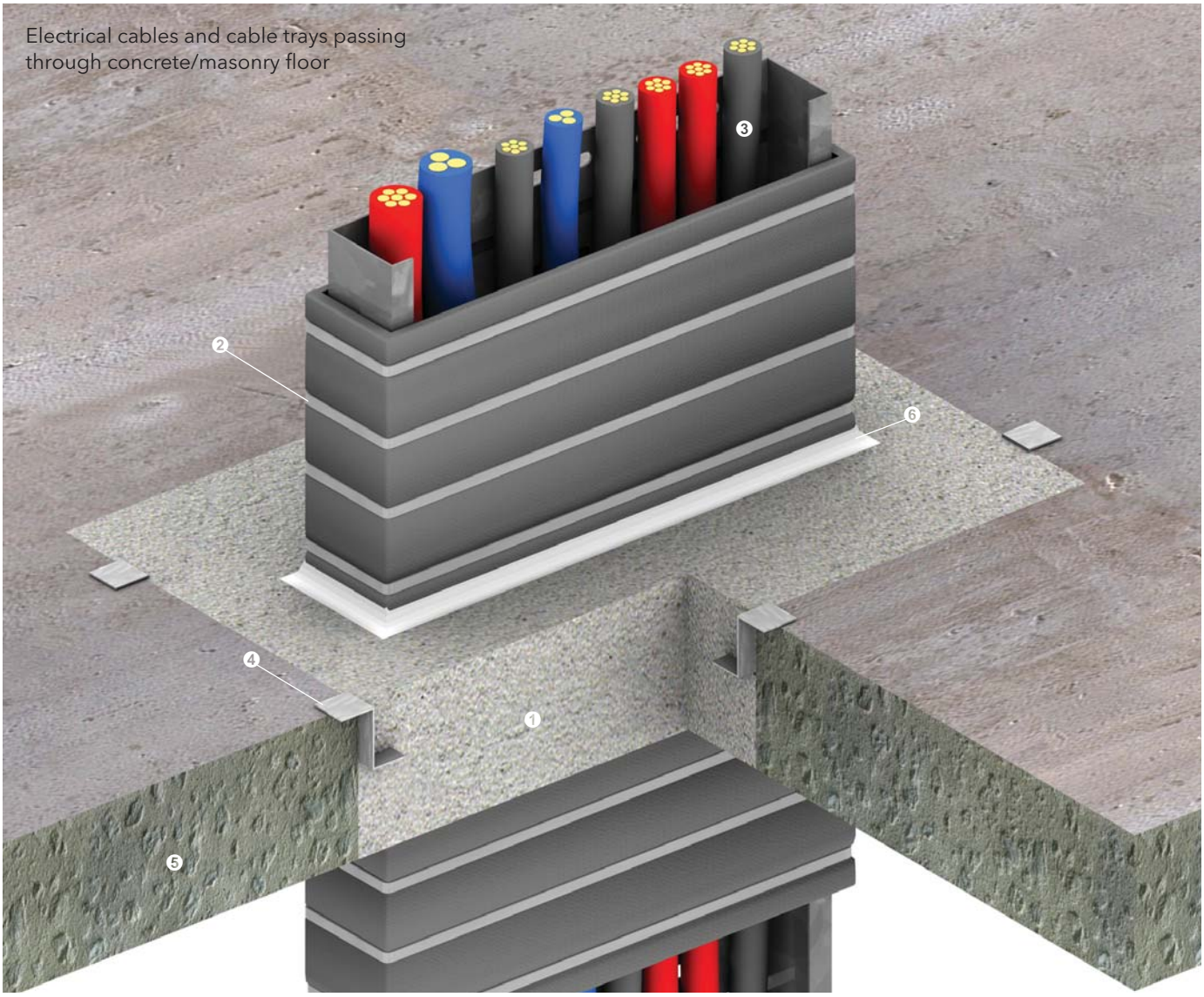
Once the formwork of choice is positioned and sealed, mix a wet slurry of PROMASEAL® Mortar and pour approximately 20mm over the entire surface of the formwork, taking care to achieve good coverage around and behind services, especially cables. When viewed from above, where gaps around perimeter edges and services exist, sealant or a drier mortar mix may be used to seal such gaps.

On the fourth side of the penetrations, where it is not possible to install steel Z-clips due to the position of the vertical wall, they can be omitted. Place the Z-clip formed angles into the opening at nominal 300mm centres. The angles to the vertical wall should be mechanically fixed using minimum 25mm nails or similar, the horizontal leg of the angle or Z-clip should sit approximately 50mm into the thickness of the PROMASEAL® Mortar.

The slurry will quickly set, in turn enabling a drier mix to be packed into position by hand. It is advisable to wear rubber gloves when handling the mortar material to prevent chapping or irritation of hands.

Pack the mix firmly to the top of the slab and trowel off to provide a neat finish. It is necessary to seal around services with a fillet of PROMASEAL®-A Acrylic Sealant to seal against the passage of smoke and water leakage in floors. The sealant should be applied in a cone "volcano" shape and should extend approximately 45mm along the service and 20mm onto the mortar element.

It is acceptable to apply dry mix directly to formwork as long as all gaps can be filled and the mortar penetrates between and around all services.



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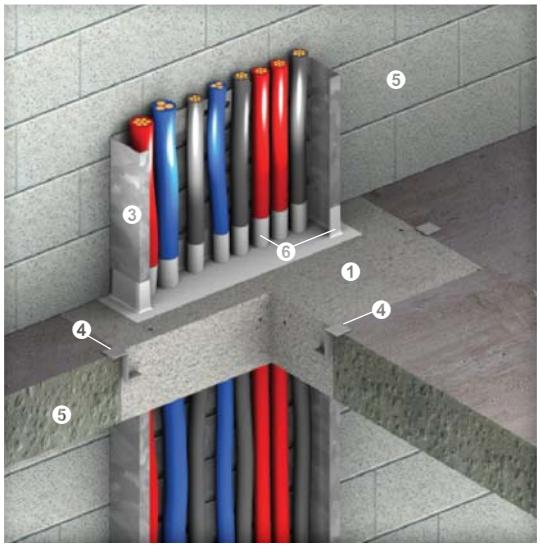


Electrical cables and cable tray passing through concrete/masonry floor with cable tray fixed to shaft wall

1. **PROMASEAL® Mortar**
2. **PROMASEAL® Wrap or PROMASEAL® SupaWrap**
3. **Electrical cables supported with cable tray or steel trunking**
4. **Steel Z-clips 25mm wide at nominal 300mm centres**
5. **Fire resistant concrete/masonry floors or walls**
6. **All joints and contact points caulked with PROMASEAL®-A Acrylic Sealant**

Installation

Penetration seals in concrete/masonry walls

1) Depth of PROMASEAL® Mortar required

For walls a minimum 90mm thick PROMASEAL® Mortar is required for fire resistance performance up to 120 minutes.

The insulation measured on the individual penetrating services may have lesser fire resistance level. To combat this issue consider the use of PROMASEAL® Wrap. Please consult Promat for more information.

2) Cored holes

Clearances around services in cored holes are generally small, requiring a dry mix to be packed into the gap between the wall and the service. In such cases formwork may not be required.

3) Purpose made service openings

These may be pre-formed or may be holes that have been knocked through existing walls. If a neat, smooth finish is required, formwork should be attached to one face of the wall over the opening. Trim the formwork around the service. It is not necessary to make the formwork fit tightly around services.

For wall applications, a dry "packing" mix should be used. Stack the mortar into the opening; it should be possible to stack the mortar to a height of 600mm at one time if the mix is correct consistency. It may be necessary to fill in along the top of the opening after the mortar has settled and set. Any small openings around the edges or around services should be sealed with PROMASEAL®-A Acrylic Sealant.

4) Waterproofing

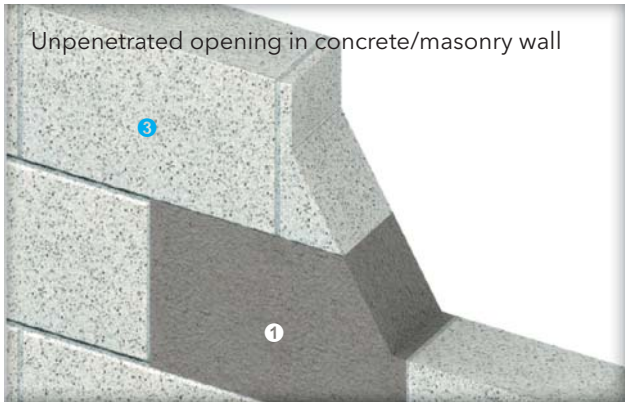
PROMASEAL® Mortar is porous. Its low density is one of the major reasons it is used on building and construction sites. If subjected to constant water coverage, water will pass through the mortar. If water resistance is required, the surface of the dry mortar must be sealed with a proprietary waterproof membrane or coating.

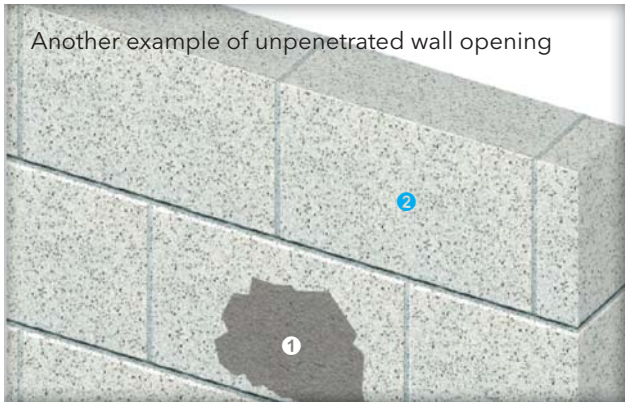
It would be prudent to prepare a sample area for testing to ensure the membrane of coating is suitable for use in terms of its compatibility with the PROMASEAL® Mortar and that the membrane/coating will provide sufficient durability to meet installation requirements. As always, the membrane/coating manufacturer's instructions should be followed precisely.

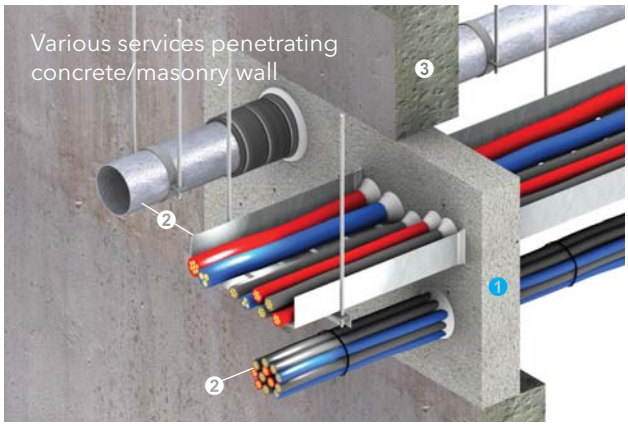
5) Surface hardening

Hardening is not a usual requirement. However, in some floor applications where small cored holes may have to be sealed, it may be necessary. This is frequently the case in office areas where equipment is being installed and may thus necessitate surface hardening.

In such instances, apply a proprietary brand cementitious, non shrink grout to the surface of the PROMASEAL® Mortar that will set into a hard surface. At all times, follow the manufacturer's instructions.







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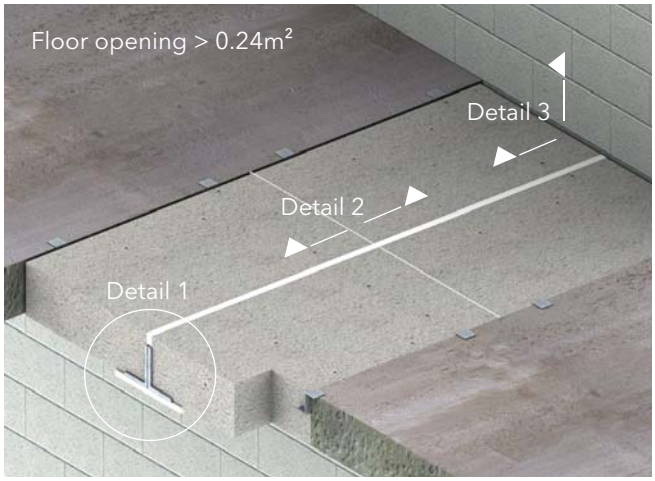
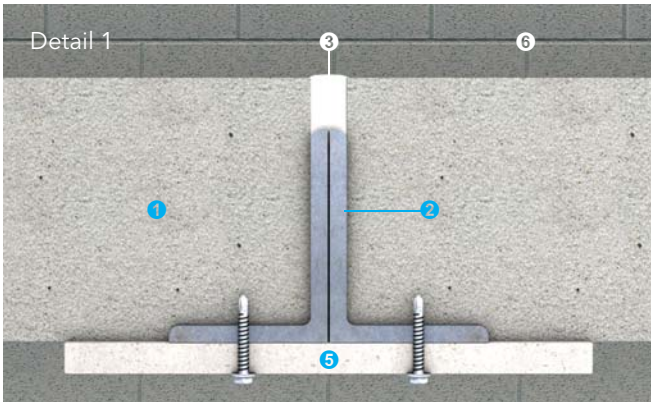
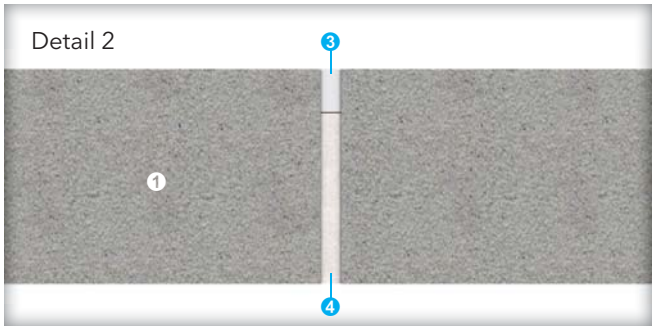
❶ PROMASEAL® Mortar

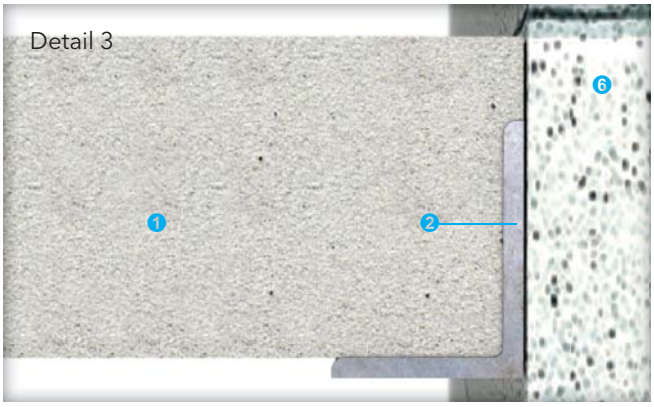
❷ Various penetrating services (see page 5 for details)

❸ Fire resistant concrete/masonry walls









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❶ PROMASEAL® Mortar

❷ Galvanised steel angles, dimension in accordance with the floor opening as follows, welded together or screwed back to back:
100mm x 75mm x 8mm thick for < 1.8m² of span
100mm x 100mm x 8mm thick for 1.8-2.4m² of span
Please consult Promat for spans > 2.4m²

❸ PROMASEAL®-A Acrylic Sealant 20mm thick filled into the joint

❹ PROMATECT®-H strips 9mm thick cast within the mortar

❺ PROMATECT®-H strips 280mm wide, thickness in accordance with the required fire resistance as follows fixed to ❷ using minimum 100mm long self-tapping screws at nominal 200mm centres:
9mm thick for -/60/60 fire resistance
20mm thick for -/90/90 fire resistance
25mm thick for -/120/120 fire resistance
35mm thick for -/180/180 fire resistance
45mm thick for -/240/180 fire resistance

❻ Fire resistant concrete/masonry floors or walls

Control joint seals

1) Openings in concrete/masonry floors

Floor openings in excess of 0.64m² must include control joint seals.

If an opening is less than 600mm long but greater than 400mm in width for the PROMASEAL® Mortar, apply PROMASEAL®-A Acrylic Sealant in all gaps and joints across the opening so that each section of the mortar is no greater than 0.64m² in area.

If an opening is greater than 600mm wide and exceeding 400mm in length, install the PROMASEAL® Mortar with supporting steel angles as illustrated in Detail 1 above.

2) Openings in concrete/masonry walls

Wall openings in excess of 0.64m² must include control joint seals.

If an opening is less than 600mm high but greater than 600mm in width for the PROMASEAL® Mortar, use a PROMATECT®-H strip as illustrated in Detail 2 above.

If an opening is greater than 600mm wide and exceeding 600mm in height, use supporting steel angles placed horizontally and a PROMATECT®-H strip filled with PROMASEAL®-A Acrylic Sealant for vertical joints.

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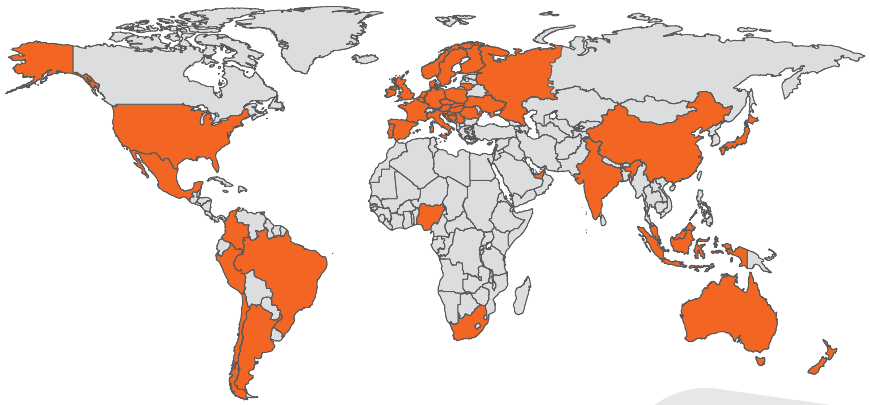
Etex is a Belgian industrial group that specialises and markets high quality building materials and systems. Founded since 1905 and headquartered in Brussels, Belgium, Etex currently operates in 107 factories and 102 subsidiaries across 42 countries, employs more than 15,000 people and is one of the largest fibre cement producers in the world.

Through its subsidiaries, the group offers an extensive range of products: small and large roofing materials, cladding and building boards, passive fire protection systems.

Etex aims to be a professional, solid partner for all kinds of building projects.



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