

Mortar

For sealing cable
and utility penetrations

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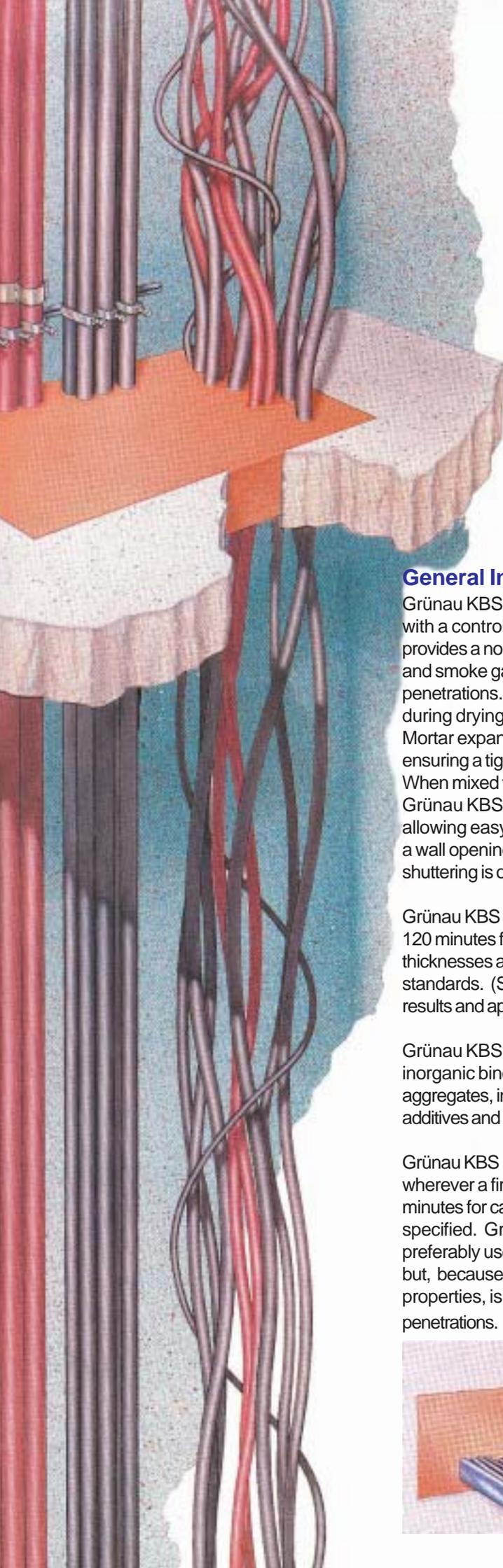
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Installation

Wall penetration

Pump application

Shutter one side of the opening and start applying Grünau KBS Mortar from the open side using a pump type mortar mixer/ applicator (such as Putzmeister "Sprayboy"). This equipment must have a shut-off valve for intermittent application. If Grünau KBS Mortar is used at the correct consistency (see box), it will not run or sag, allowing for easy build-up. When sealing large penetrations (more than 30 cm in height), it is advisable to support the applied material on the front side with panels as filling progresses. When there is no front-shuttering (smaller openings), the mortar may be levelled out with a trowel after one hour of setting. Shuttering can be removed, depending on temperature and opening size, after a minimum of 24 hours.

Manual Application

For smaller installations or repairs (retrofitting), Grünau KBS Mortar may also be mixed manually, adhering to the above rules. For wall installations, use a heavier consistency to achieve a stiff, non-sagging material, which can be applied by trowel. For floors use more water.

Retrofitting

New cables or other utilities may be easily installed in a Grünau KBS Mortar seal. The material is of low compressive strength, which facilitates easy drilling (by hand or motor drill) for an adequate opening. After cables have been passed through, some hand-mixed Grünau KBS Mortar is used for resealing. A bulk loading caulking gun can be used for this.

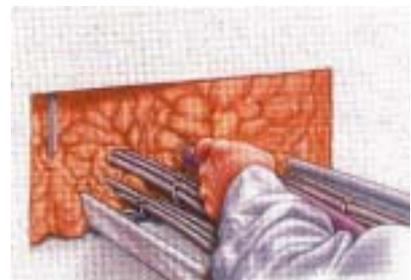
General Information

Grünau KBS Mortar is a dry mortar mix with a controlled swelling effect, which provides a non-shrinking, homogenous and smoke gas-tight fire seal for cable penetrations. Most mortars shrink during drying or curing. Grünau KBS Mortar expands while it sets (up to 3%), ensuring a tight and crack-free seal. When mixed to pumping consistency, Grünau KBS Mortar will not run or sag, allowing easy build-up of material inside a wall opening. For smaller openings, shuttering is only necessary on one side.

Grünau KBS Mortar has been rated for 120 minutes fire resistance at various thicknesses as per all important standards. (See list of international test results and approvals on back page.)

Grünau KBS Mortar is a blend of inorganic binders, fillers and lightweight aggregates, interlaced with special additives and agents.

Grünau KBS mortar may be used wherever a fire resistance of 120 minutes for cable penetrations is specified. Grünau KBS Mortar is preferably used for floor penetrations but, because of its non-sagging properties, is also easily installed in wall penetrations.



Technical Data/ Mixing

Floor Penetrations

Shuttering

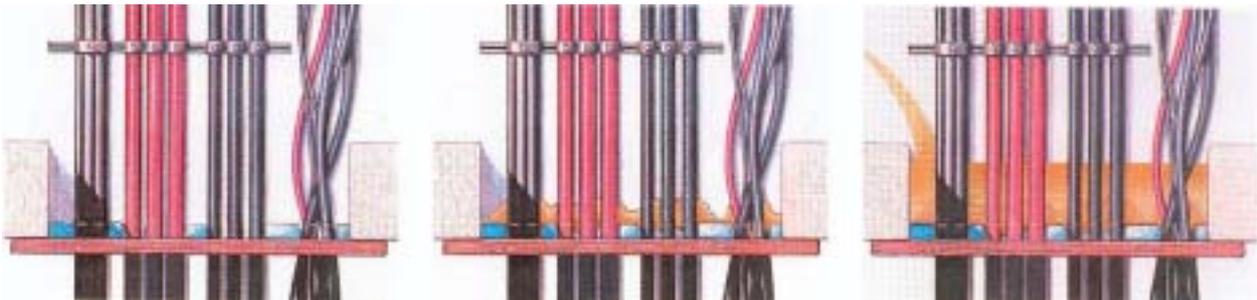
The underside of the floor opening is to be shuttered with suitable materials (such as hard-foam panels, held in place with a wood lath). Please note, exact cutting around penetrating utilities is not necessary.

Preparing

For closing gaps of the shutter, mix Grünau KBS Mortar to a heavy consistency by using less water (see box). Apply this heavy mix by trowel over all the remaining openings and allow to set for at least one hour. All masonry surfaces coming in touch with the mortar must be free from loose dust, dirt or oil and should be wetted prior to application of mortar. **This also applies to wall penetrations.**

Pouring

Mix Grünau KBS Mortar to pouring consistency (see box), using conventional mortar mixing equipment (cement mixer). Pour Grünau KBS Mortar into the opening up to the level of the floor. It will flow between all utilities and level out to a perfect finish. Allow to dry and cure for at least one week (longer for very large openings) before removing shuttering. If access to the floor penetration is necessary, apply a suitable cover.



Technical Data

Colour: Red

Bulk density: Approx. 600 g/l

PH-value at working consistency: 12.3

Toxicity: Non-toxic

Shelf life: In original, unopened bags at least one year

Storage Temperature: -20°C/ +40°C

Combustibility: Non-combustible

Packaging: 25 kg multi-layer bags with polyethylene lining

Density of cured material: Approx. 0.6 g/ cm³

Compressive strength: Approx. 0.6-0.7N/mm²

Expansion:

Approx. 3 Vol.% / 20°C / 24 hours

Workability: Max. 60 minutes

Complete hardening: Approx. 30 days

Minimum temperature for application of Grünau KBS Mortar: +5°C

Cleaning of equipment: Water immediately after use.

Mixing dry KBS Mortar

Water / mortar ratio for various types of application

Pour about half of the indicated amount of water into a mixing container and start mixing. Add the rest of the water slowly.

| | Manual application (walls and floors) | Pump application (walls and floors) | Pouring application (floors) |
|-----------------|--|--|---------------------------------|
| 25kg dry mortar | 16 L water | 17 L water | 18 L water |
| Approx. yield | 35-36 L | 36 L | 36 L |
| 1kg dry mortar | 0.65 L water | 0.70 L water | 0.72 L water |
| Approx. yield | 1.4 - 1.5 L | 1.5 L | 1.5 L |



Mortar Seal

Selection of International Test Results and Approvals

| Country | testing institute / Approval body | Ceiling or wall test | Mortar seal thickness (mm) | No. of Cables | official fire resistance rating F/T** | Standard | Ref. No. |
|--------------|-----------------------------------|----------------------|----------------------------|---------------|---------------------------------------|--------------------|----------|
| Australia | CSIRO | floor | 120 | 25 | 30-12 T 120 F | AS1530 p.4 | 3101 |
| Belgium | Universite de liege | wall | 190 | 15 | 120 F/T | NBN 713.020 | 315 |
| France | C.S.T.B. | wall | 200 | 9 | 120 F/T | Arrete Ministeriel | 624 |
| Germany | Dibt, Belin | wall | 200 | 60% fill | 90 F/T* | DIN4102 | 125 |
| | | floor | 200 | 60% fill | 90 F/T* | DIN4102 | |
| Germany | Dibt, Belin | wall | 200 | 60% fill | 120 F/T* | DIN4102 | 126 |
| | | floor | 200 | 60% fill | 120 F/T* | DIN4102 | |
| Italy | CSI Institute Giordano | wall | 250 | - | 180 F/T | Circulare n. 91 | 1011 |
| | | floor | 250 | 42 | 180 F/T | Circulare n. 91 | 1012 |
| Malaysia | Inst. Penyelidikan Perhutanan | wall | 150 | 10 | 120 F/T | UL1479 | 3301 |
| South Africa | SA Bureau of Standards | wall | 225 | 22 | 120 F/T | SABS 017 p.11 | 4005 |
| Switzerland | VKF | wall | 200 | 11 | 90 F/T* | VKF, AEAI | 506 |
| | | floor | 180 | 11 | 90 F/T* | | |
| UK | LPC/BRE | wall | 100 | - | 240 F/T | BS 476, p. 20 | 941 |
| | | floor | 100 | - | 240 F/T | BS 476, p. 20 | 946 |
| UK | LPC/BRE | floor | 200 | cable bundle | 120 F/T | UL1479 / | 912 |
| | | floor | 200 | 477 | 30-60 T | BS 476 | |
| | | floor | 200 | - | 180 F/T | | |
| USA | UL | floor | 200 | 477 | 180 F | UL1479 | 2016 |
| | | | | - | 0-120 T | | |
| USA | FM Global | wall | 114 | various / | 60-120 F/T | FM4990 | 2021 |
| | | floor | 114 | cable/pipe | 60-120 F/T | | |
| USA | FM Global | wall | 114 | various / | 60-120 F/T | ASTM E 814 | 2021 |
| | | floor | 114 | cable/pipe | 60-120 F/T | ASTM E 814 | |

* in Germany and Switzerland only 90 minutes are required

**F=fire rating / T=temperature rating on cables

The above data, particularly the recommendations for the application and use of our products are based on our knowledge and experience. Due to different materials and conditions of application, which are beyond our control, we recommend in any case to carry out sufficient tests in order to ensure that our products are suitable for the intended processes and applications. Therefore, any liability for such recommendations or any oral advice is expressly excluded unless we have acted wilfully or by gross negligence.