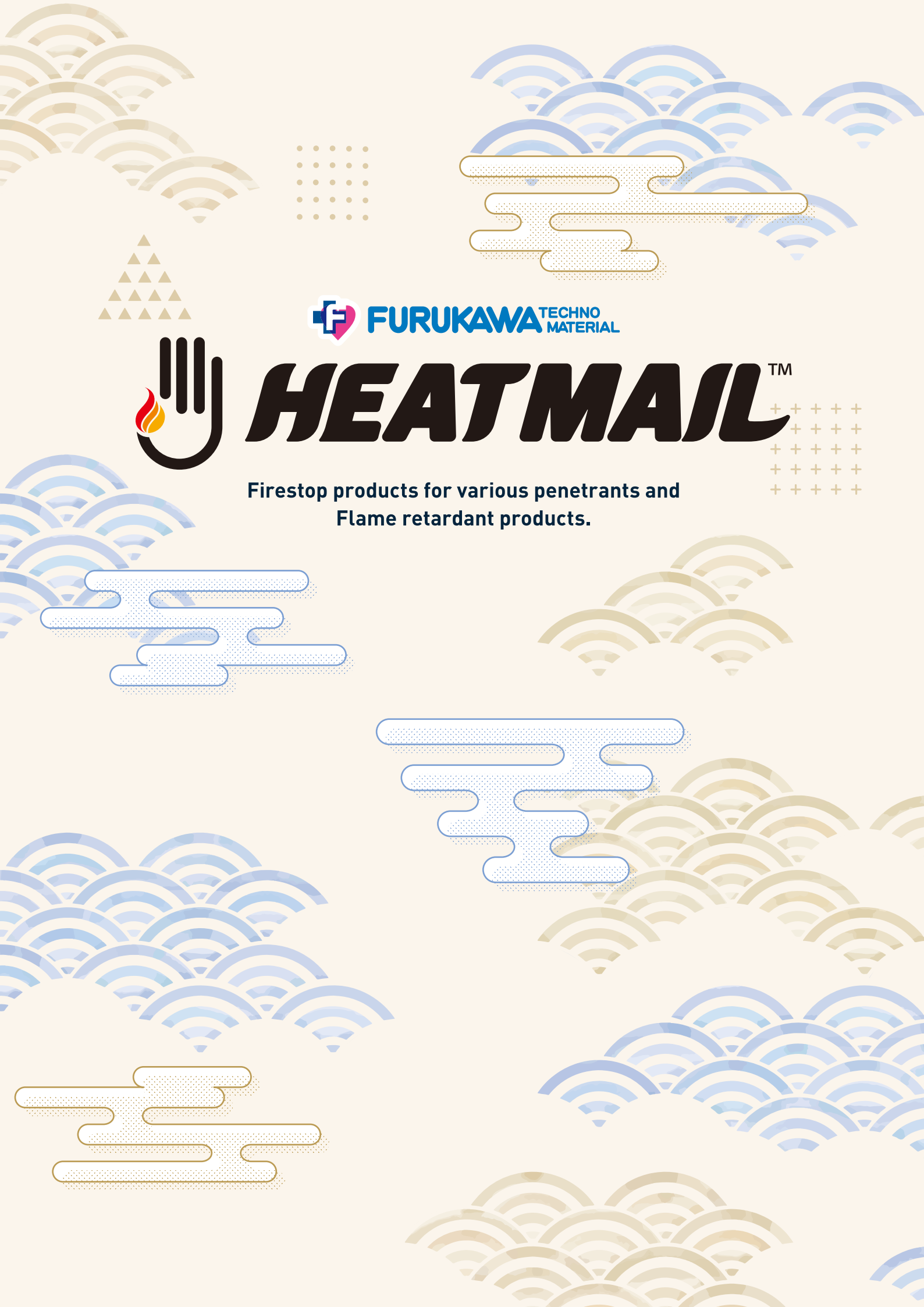


 **FURUKAWA** TECHNO
MATERIAL



HEATMAIL™

Firestop products for various penetrants and
Flame retardant products.





Fire in high-rise buildings causes serious damage.

The fire spreads to the upper floors and to the next room through flammable materials and expands to the whole building and increases the damage.

However, we have the most effective and easy system to prevent the spread of the fire.

It is to partition the building into sections with fireproof walls and floors, and to block through-penetrating portions for such as cables with a fire-protection material.





Where the Firestop systems are used?

- Floors and walls partitioning the uses of the building.
- Pipe shafts and compartments of stairs.
- Partition walls between residences.

As known, the cables and pipes, passing through these parts, spread the fire like a fuse.

Filling up these portions penetrating floors and walls with the Firestop system is effective for the prevention.



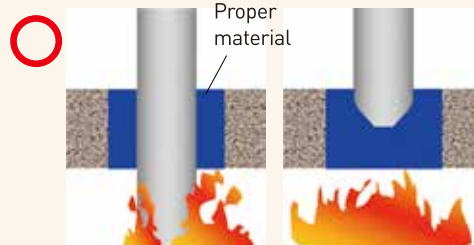
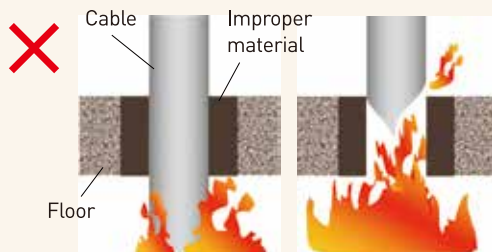
What is the actual effect?

In case of the fire from the bottom side of the cable, with the Firestop system, it is not transmitted to burn at all, but, without the system, it is burned in a short while.



What materials required for the Firestop system?

- The performance certification has been certified in line with the laws and regulations and standards.
- The characteristics and effects are confirmed by testing.



If filled up with improper materials, fire spreads from the gap where the cable or pipe melted.

By filling up with the proper material, the gap can be blocked up, and fire does not spread.

Through-Penetration Firestop systems

Why the Firestop system would become necessary?

In case of Japan... from around 1970, high-rise buildings has been increased. As a result of repeated large building fire, laws and regulations, to install the Firestop system at cables and pipes penetration portions, has been enacted and is mandatory now. Also in many other countries, the installation has been required by law.



Heatmail™ Series

The simplest measures to suppress the damage of building fire also protect equipment and human lives are the installation of the fire protection sections and fire protection measures at the electric wire cable through-penetration portion.

A lot of electric wire cables are laid throughout buildings.

Office building, hotel, high-rise housing---, for any type of building, a lot of electric wire cables are laid for each facility. These electric wire cables are wired in a long bundle from downstairs to upstairs or to the next floor. On the other hand, it is known that the cables are covered with a flammable resin such as polyethylene or vinyl chloride, so once ignited, it continues to spread like a fuse line.

Fear of the cable fire is said to be more than imagined.

The fear of the cable fire is at the speed of fire spreading beyond imagination. The covering of the cable has 1.4 to 2 times as much caloric value as wood and coal. The cables wired in a bundle, once ignited, burn violently and continue to spread in a short time like fuse lines, then damage expands to the entire building.

The damage caused by a large fire is as demonstrated by actual examples. Needless to say about direct damage such as buildings, equipment, human damage etc., secondary damage such as cost for restoration, social obligation, impact on production, deterioration of operation / control capability of the entire plant, or broadly, the loss of social credibility and so on, the larger the scale of fire the more damage it suffers.



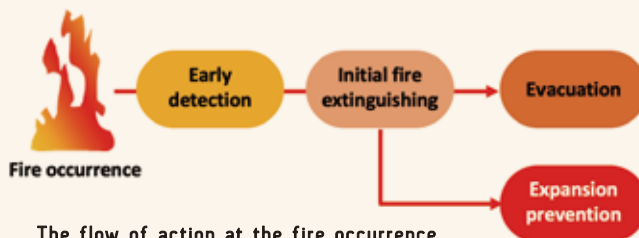
Proper fire protection measures protect buildings and human lives.

The flow of action at the fire occurrence is said as follow,

Fire occurrence → Initial fire extinguishing → Evacuation → Expansion prevention

Installation of the fire protection sections and fire protection measures properly applied to the part where cables pass through, are very important as the last stronghold for the fire expansion prevention.

Of course, even in the early stage of fire, the fire protection measures of the penetration portion are very effective in minimizing the damage.



The flow of action at the fire occurrence.

- Installation of fire protection sections.
- Fire protection measures at penetrating portions.

Thus, in buildings, it is pointed out the importance of installing a fire protection material in the through-penetration portion of the cables, in addition to install fire prevention sections with fireproof walls / floors for each certain floor area. It is said that the partition of the building by the fire protection sections and "the fire protection measures of the cables through-penetrating portion" are the simplest and reliable measure to protect equipment and human lives.

Is the cables through-penetrating portion left open?

Regular inspections of in use buildings are conducted?

It is ideal to keep it blocked in the proper way.

Nevertheless, installation is cumbersome.

How can we avoid the risk?

Here, we propose a solution.



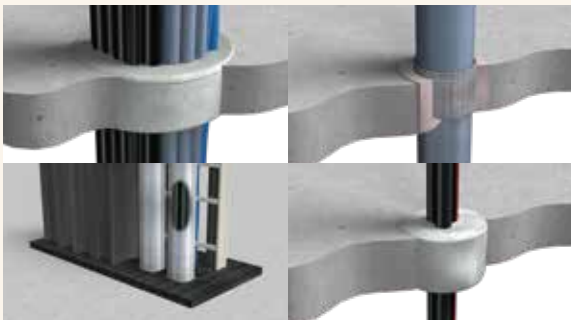
Firestop Systems

Basic installation is just fills up the fireproof filler material.
Proper installation can enhance fire safety of buildings and facilities.

Especially for using Firestop Block & Putty disassembling and restoring, in accordance with the cable wiring work, is easy and the fire protection function of the building can be kept at all times.

Furthermore

We acquired the first certification in Japan for the fire protection treatment material in through-penetrating portions, and have over 40 years of experience since then. Please consult about fire protection measures, product technology and installation.



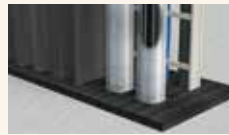
Firestop systems for various penetrants

Office building, hotel, high-rise condominium., for any type of building, a lot of electric wire cables are laid for each facility. The cables wired in a bundle, once ignited, burn violently and continue to spread in a short time like fuse lines, then damage expands to the entire building. Filling up these portions penetrating floors and walls with the Firestop systems are effective for the prevention.

01

Firestop Block

P06-08



UL System No. C-AJ-8331



UL System No. C-AJ-1758

02

FIRESTOP MORTAR

P09-12



UL System No. C-AJ-8332



UL System No. C-AJ-1759



UL System No. C-AJ-2935

03

Firestop Putty-KP

P13-14



UL System No. C-BJ-3035



01

Firestop Block

Firestop systems for cable penetrations



The optimum material / installation method for large rectangular openings and round opening that various penetrants pass-through.

Firestop Block is a block-shaped fireproof filler material that combines a high heat-resistant / high fireproof material with a material that expands in volume under fire heat.



UL System No. C-AJ-8331

Excellent fireproof performance.(2 hours fireproof)

2 hours fireproof performance has been certified. (UL System No. C-AJ-8331)

Optimum for large openings.

It is suitable for various types of openings with small to large size and can be applied to the openings either in floors or walls.

Easy to install.

Easy installation just filling up the openings. No special tools or skills are necessary. Dismantling / re-installation is simple.



UL System No. C-AJ-1758

Excellent fireproof performance.(2 hours fireproof)

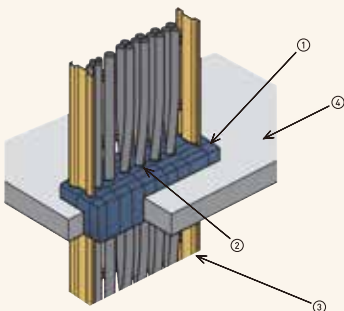
2 hours fireproof performance has been certified.(UL System No. C-AJ-1758)

Optimum for round openings.

Optimum for round opening where conduit penetrate.

Easy to install.

Easy installation just filling up the openings. No special tools or skills are necessary. Dismantling / re-installation is simple.



Technical Data

① Firestop Block

Use application:

Thermal expansion fireproof block to fill up space between the cables and the opening.

Size L	200 × 50 × 200 mm	Weight 380g
Size M	100 × 50 × 200 mm	Weight 190g
Size S	100 × 25 × 200 mm	Weight 140g
Size SS	50 × 25 × 200 mm	Weight 70g

② Firestop Putty-BP

Use application:

Thermal expansion fireproof putty to fill up small clearances between the cables or the cables and the blocks.

③ Penetrants

④ Concrete floors or walls

(Please refer to Installation Guide for details.)

Fireproof Certification

UL System No. C-AJ-8331, C-AJ-1758

ANSI/UL 1479(ASTM E814)

Fire Rating 2Hr

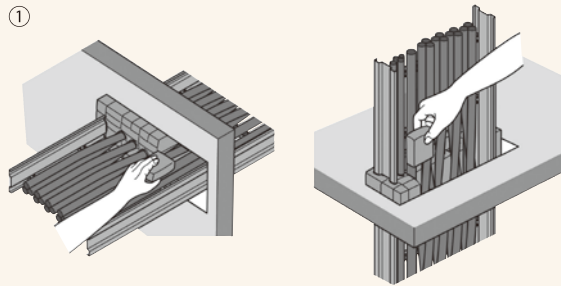


Firestop Block

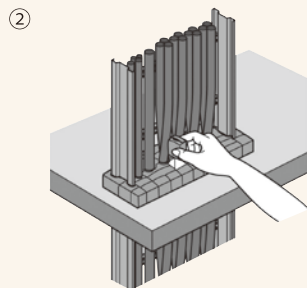
Firestop systems for cable penetrations



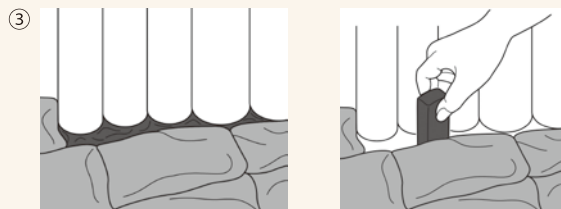
Installation Procedure



① Fill up the spaces between the opening and the cables / the cable trays with the blocks.
For wider spaces, the large size blocks shall be selected.

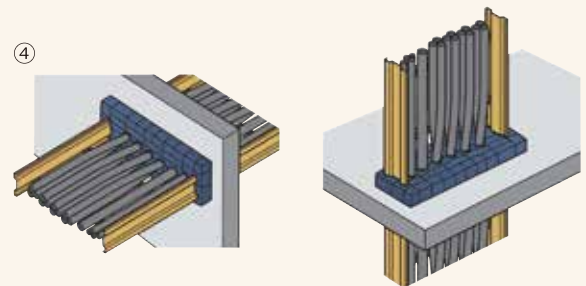


② Fill up the gaps between the cables with the blocks.
For narrow spaces, select the small blocks as appropriate and fill up them in combination.



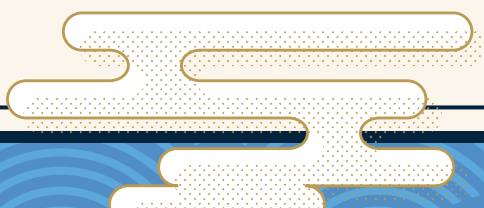
③ Finish by sealing annular spaces between the cables or tiny gaps between the blocks with Firestop Putty-BP.
Push in to the depth of 50mm or more from the surface of the blocks.

④ Fill up the blocks so that they are at the center of the opening in the floor or the wall.
When necessary, use a block supporting material such as a wire mesh.
The installation is completed by aligning the blocks flat.



Sales unit, Packaging

Size	Quantity per box	Box weight (kg)	Sales unit (Box)
Block L	10	4.5	1
Block M	20	4.5	1
Block S	30	5.0	1
Block SS	50	4.5	1
Firestop Putty-BP	100	5.0	1



Installation Guide UL System No. C-AJ-8331

Floor or Wall Assembly

Min 114 mm (4-1/2inch) thick reinforced normal weight (2320-2480 kg/m³ or 145-155 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max area of opening is 0.6 m² (930inch²) with a max dimension of 1200 mm (47-1/4inch).

Cables

Aggregate cross-sectional area of cables in cable tray not to exceed 40 percent of the cross-sectional area of the cable tray based on a max 82mm (3-1/4inch) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

① Max 1/C No. 650 kcmil (or smaller), ② Max 1/C No. 1000 kcmil (or smaller) copper conductor power cables with XLPE or PVC insulation with PE jacket, ③ Max 1/C No. 4 AWG (or smaller), ④ Max 1/C No. 10 AWG (or smaller), ⑤ Max 4/C No. 1 AWG (or smaller), ⑥ Max 4/C No. 14 AWG (or smaller), ⑦ Max 3/C No. 2/0 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket, ⑧ Max 3/C No. 14 AWG (or smaller), ⑨ Max 2/C No. 10 AWG (or smaller) copper conductor power cables with PVC insulation with PVC jacket, ⑩ Max 30/C No. 12 AWG (or smaller), ⑪ Max 2/C No. 16 AWG (or smaller) copper conductor control cables with PVC insulation with PVC jacket, ⑫ Max 63.6mm² Fiber Optic (F.O) cables with PE insulation and jacket, ⑬ Max 50 pair No. 19 AWG (or smaller), ⑭ Max 1 pair No. 22 AWG (or smaller) copper conductor telecommunication cables with PE insulation and PVC jacket, ⑮ Max 19.2mm² coaxial cables with PE insulation with PVC jacket, ⑯ Max 4 pair No. 24 AWG (or smaller) copper conductor data cables with PE insulation and PVC jacket.

Busway

Nom 750mm (29-9/16inch) wide by 120mm (4-3/4inch) deep (or smaller) "I" shaped aluminum and steel enclosure containing factory mounted copper bars rated for 600V, 5000A or aluminum bars rated for 600V, 4000A. One busway may be installed within the opening. The annular space between the busway and the periphery of the opening shall be min 45mm (1-13/16inch) to max 225mm (8-7/8inch). Busway to be rigidly supported on both sides of floor or wall assembly. The busway shall bear the UL Listing Mark and shall be installed in accordance with all provisions of Article 364 of the National Electrical Code, NFPA 70.

Conduit

A max of two metallic conduits installed concentrically within the opening. The annular space between the conduit and the periphery of the opening shall be min 30mm (1-3/16inch) to max 225mm (8-7/8inch). Penetrant to be rigidly supported on both sides of floor or wall. The following types and sizes of metallic conduit may be used : Nom 102mm (4inch) diam (or smaller) steel electrical metallic tubing or rigid steel conduit.

Cable Tray

Max 1000 mm wide (39-3/8inch) by max 75 mm (3inch) deep open-ladder cable tray with channel-shaped side rails formed of min 1.6 mm thick steel with or without rungs. A max of one cable tray to be installed in the opening. The annular space between the cable tray and the periphery of the opening shall be min 40mm (1-5/8inch) to max 225mm (8-7/8inch). Cable tray to be supported on both sides of the floor or wall assembly.

Firestop System — The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials — Pillow (Firestop Block 200L) — Nom 200mm (7-7/8inch) long by 200 and 100mm (7-7/8 and 3-15/16inch) wide by 53mm (2-1/8inch) thick and nom 200mm (7-7/8inch) long by 100 and 50mm (3-15/16 and 2inch) wide by 28mm (1-1/8inch) thick pillows tightly- packed into the opening to fill annular space between all penetrants and periphery of opening. Pillows installed centered within the opening, edge first. If the floor is less than 200mm thick, the pillows should either be extended from or flush with the top and bottom surface of the floor without recess from above and below. If the floor is equal to or greater than 200mm thick, the pillows are to be flush with the bottom surface of the floor or recessed equally from both surfaces of the floor. The pillows should extend or recess equally from both surfaces of the wall.

B. Fill, Void or Cavity Materials — Firestop Putty-BP — Min 7 mm (5/16inch) thick by 30mm (1-3/16inch) deep of fill material to be cut to proper width to completely fill side rails or any cavities within the opening. All voids within the opening shall be filled after installation of pillows.

Installation Guide UL System No. C-AJ-1758

Floor or Wall Assembly

Min 114 mm (4-1/2inch) thick reinforced normal weight (2320-2480 kg/m³ or 145-155 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max diam of opening shall be 200mm (7/7/8inch).

Conduit

One metallic conduit installed concentrically within the opening. The annular space within the firestop system shall be a nom 43mm (1-3/4inch). Penetrant to be rigidly supported on both sides of floor or wall. The following types and sizes of metallic conduit may be used : Nom 102mm (4inch) diam (or smaller) steel electrical metallic tubing or rigid steel conduit.

Firestop System — The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials — Pillow (Firestop Block 200L) — Nom 200mm (7-7/8inch) long by 200 and 100mm (7-7/8 and 3-15/16inch) wide by 53mm (2-1/8inch) thick and nom 200mm (7-7/8inch) long by 100 and 50mm (3-15/16 and 2inch) wide by 28mm (1-1/8inch) thick pillows tightly- packed into the opening to fill annular space between the penetrant and periphery of opening. Pillows installed centered within the opening, edge first. If the floor is less than 200mm thick, the pillows should either be extended from or flush with the top and bottom surface of the floor without recess from above and below. If the floor is equal to or greater than 200mm thick, the pillows are to be flush with the bottom surface of the floor or recessed equally from both surfaces of the floor. The pillows should extend or recess equally from both surfaces of the wall.

B. Fill, Void or Cavity Materials — Firestop Putty-BP — Min 7 mm (5/16inch) thick by 30mm (1-3/16inch) deep of fill material to be cut to proper width to completely fill side rails or any cavities within the opening. All voids within the opening shall be filled after installation of pillows.

02

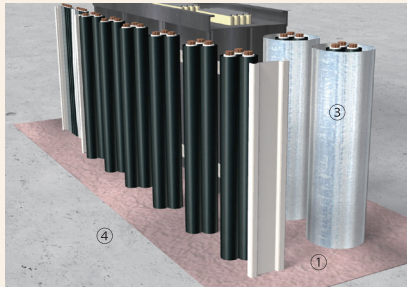
FIRESTOP MORTAR

Firestop system for cable penetrations

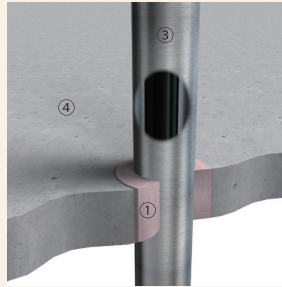


The optimum material / installation method for large rectangular openings and round opening that various penetrants pass-through.

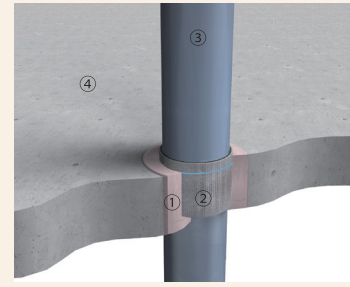
FIRESTOP MORTAR is a light-weight cost conscious solution for various openings in concrete walls and floors. Once mixed with water, it forms a light weight clay form that easily applies into concrete walls and floors. FIRESTOP MORTAR cures quickly and will not spall or crack due to by changes in temperature.



UL System No.C-AJ-8332



UL System No.C-AJ-1759



UL System No.C-AJ-2935

Excellent fireproof performance. (2 hours fireproof)

2 hours fireproof performance has been certified. (UL System No. C-AJ-8332, C-AJ-1759, C-AJ-2935)

Suitable firestop material for various openings and cost conscious solution.

It is suitable for various types of openings with small to large size and can be applied to the openings either in floors or walls.

PVC pipe can be penetrate to round opening

PVC pipe can also be penetrated by wrapping BP-sheet around that to help prevent fire and smoke from spreading through round opening.

Technical Data

- ① FIRESTOP MORTAR
Use application:
FIRESTOP MORTAR to fill up a space between cables and the opening.
- ② Firestop Sheet-BP
Use application:
Thermal expansion fireproof sheet to wound PVC pipe to fill up small round opening with FIRESTOP MORTAR
- ③ Penetrants
- ④ Concrete floors or walls
[Please refer to installation Guide for details]



Fireproof Certification

UL System No. C-AJ-8332, C-AJ-1759, C-AJ-2935
ANSI/UL 1479(ASTM E814)
Fire Rating 2Hr

Sales unit, Packaging

Item	Unit dimension (mm)	Unit weigh (kg)	Sales unit (Pack)
FIRESTOP MORTAR	380(W) x 720(H) x 150(D)	20	1
Firestop Sheet-BP	135(L) x 135(W) x 85(H)	0.6	1



Installation Procedure

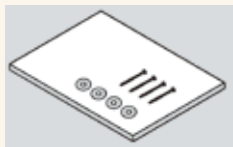
1) Clean the penetration

Clean the penetrating part first for avoiding the dust.

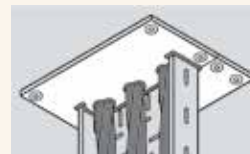
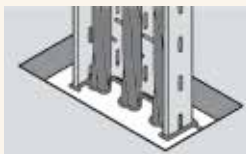


2) Set up the support plate

Before pouring the mortar, cut the support plate according to the wiring and piping conditions of the penetrating object and install it.



Fill any gaps between penetrants and support plate with sealants to avoid leakage of mortar after pouring it.



*For floor construction, install it on the lower side, and for wall construction, install with the mortar pouring opening on one side and cover all openings on the opposite side.

3) Mixing

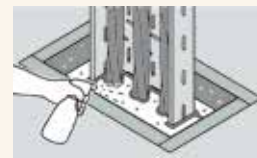
Slowly add water to the powdered mortar and stir it until the mixture becomes clay-like.



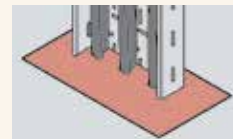
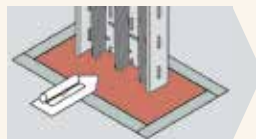
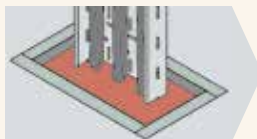
※Use of an electric mixer is recommended.

4) Moisten the penetration and Pouring mortar

Before pouring mortar, moisten the penetrating part by using spray to avoid the wall or floor absorb moisture in mortar. Also surround the opening with curing tape or other to prevent around the opening from soiling.



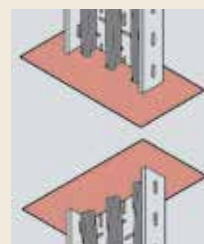
After the opening is moistened and cured, mortar is poured in several batches until the opening is completely filled with mortar.



※Do not pour all at once into a large opening, as it may collapse under its own weight. Especially for first layer need cured time to avoid collapse by its own weight.

5) Remove the support plate and Finishing the surface

Let it stand for a few days (48hours minimum) until the mortar hardens. Remove the support plate and fill any gaps with mortar to smooth the surface.



Installation Guide UL System No.C-AJ-8332

Floor or Wall Assembly

Min 14mm (4-1/2 inch) thick reinforced normal weight (2320-2480 kg/m³ or 145-155 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max area of opening is 0.6m² (930 inch²) with a max dimension of 1200mm (47-1/4 inch).

Through Penetrant

A max of 4 firestop configurations may be installed within the opening provided that the following parameters relative to the annular spaces are maintained. The space between the firestop configurations shall be min 40mm (1-5/8 inch) except for the following: the annular space between cable tray and busway shall be min 165mm (6-1/2 mm). The space between the firestop configurations and periphery of opening shall be min 40mm (1-5/8 inch) to max 225mm (8-7/8 inch). Through penetrants to be rigidly supported on both sides of floor or wall assembly. The T Rating of the system is dependent on the firestop configuration, as shown in the table below. Any combination of the following firestop configurations detailed herein may be used:

Firestop Configuration A

A. Cable Tray

Max 700mm wide (27-9/16 inch) by max 100mm (3-15/16 inch) deep open-ladder cable tray with channel-shaped side rails formed of min 2.0mm (0.0787 inch) thick steel and with min 40mm (1-5/8 inch) wide by 20mm (13/16 inch) deep rungs spaced nom 300mm (12 inch) on center. A max of one cable tray to be installed in the opening. The annular space between the cable tray and the periphery of the opening shall be min 60mm (2-3/8 inch) to max 225mm (8-7/8 inch). Cable tray to be supported on both sides of the floor or wall assembly.

B. Cables

Aggregate cross-sectional area of cables in cable tray not to exceed 25 percent of the cross-sectional area of the cable tray based on a max 93mm (3-11/16 inch) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

- ① Max 1/C No. 650kcmil (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ② Max 1/C No. 4 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ③ Max 4/C No. 1 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ④ Max 3/C No. 2/0 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.

Firestop Configuration B

C. Cable Tray

Max 300mm wide (11-13/16 inch) by max 50mm (2 inch) deep open-ladder cable tray with channel-shaped side rails formed of min 1.6mm (0.0630 inch) thick steel with or without rungs. A max of one cable tray to be installed in the opening. The annular space between the cable tray and the periphery of the opening shall be min 85mm (3-3/8 inch) to max 225mm (8-7/8 inch). Cable tray to be supported on both sides of the floor or wall assembly.

D. Cables

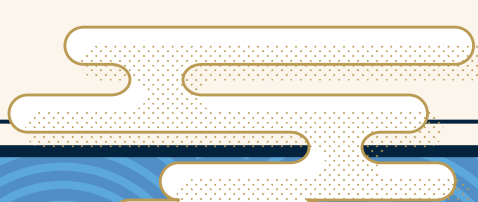
Aggregate cross-sectional area of cables in cable tray not to exceed 40 percent of the cross-sectional area of the cable tray based on a max 47mm (1-7/8 inch) cable loading depth within the tray. Any combination of the following types and sizes of cables may be used:

- ① Max 1/C No. 10 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ② Max 4/C No. 14 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ③ Max 3/C No. 14 AWG (or smaller) copper conductor power cables with XLPE or PVC insulation with PVC jacket.
- ④ Max 2/C No. 10 AWG (or smaller) copper conductor power cables with PVC insulation with PVC jacket.
- ⑤ Max 2/C No. 16 AWG (or smaller) copper conductor control cables with PVC insulation with PVC jacket.
- ⑥ Max 63.6mm² Fiber Optic (F.O) cables with PE insulation and jacket.
- ⑦ Max 1 pair No. 22 AWG (or smaller) copper conductor telecommunication cables with PE insulation and PVC jacket.
- ⑧ Max 19.2mm² coaxial cables with PE insulation with PVC jacket.
- ⑨ Max 4 pair No. 24 AWG (or smaller) copper conductor data cables with PE insulation and PVC jacket.
- ⑩ Max 4 pair No. 24 AWG (or smaller) copper conductor data cables with PE insulation and PVC jacket.

Firestop Configuration C

E. Busway

Nom 750mm (29-9/16 inch) wide by 120mm (4-3/4 inch) deep (or smaller) "I" shaped aluminum and steel enclosure containing factory mounted copper bars rated for 600V, 5000A or aluminum bars rated for 600V, 4000A. One busway may be installed within the opening. The annular space between the busway and the periphery of the opening shall be min 55mm (2-3/16 inch) to max 225mm (8-7/8 inch). Busway to be rigidly supported on both sides of floor or wall assembly. The busway shall bear the UL Listing Mark and shall be installed in accordance with all provisions of Article 364 of the National Electric Code, NFPA 70.



Firestop Configuration D Through Penetrant

A max of two metallic conduits installed concentrically within the opening. The annular space between the conduit and the periphery of the opening shall be min 40mm(1-3/16inch) to max 225mm(8-7/8inch). Penetrant to be rigidly supported on both sides of floor or wall. The following types and sizes of metallic conduit may be used:

F. Conduit

Nom 102mm(4inch) diam(or smaller) steel electrical metallic tubing or rigid steel conduit.

Firestop System

– The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials – Mortar – Min 114mm(4-1/2inch) thickness of fill material installed flush with both surfaces of floor or wall to completely fill the gap between all the penetrants and the wall/floor opening. Mortar to be mixed at a rate of 1 part dry mixture to 0.8-1 part water by weight in accordance with the installation instructions supplied with the product.



Installation Guide UL System No.C-AJ-1759

Floor or Wall Assembly

Min114mm(4-1/2inch) thick reinforced normal weight(2320-2480kg/m³ or 145-155 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max diam of opening shall be 200mm (7-7/8inch).

Through Penetrant

One metallic conduit installed concentrically within the opening. The annular space within the firestop system shall be a nom 43mm (1-3/4inch). Penetrant to be rigidly supported on both sides of floor or wall. The following types and sizes of metallic conduit may be used:

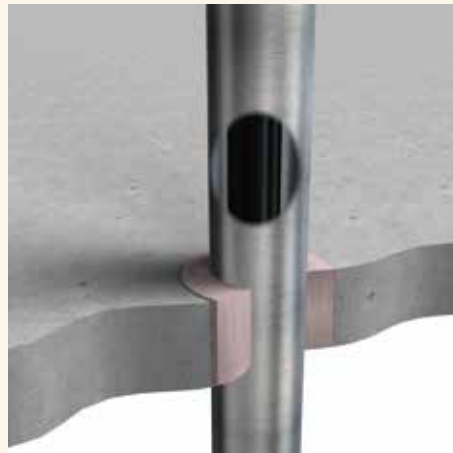
A. Conduit

Nom 102mm(4inch) diam(or smaller) steel electrical metallic tubing or rigid steel conduit.

Firestop System

– The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials – Mortar – Min 114mm(4-1/2inch) thickness of fill material installed flush with both surfaces of floor or wall to completely fill the gap between all the penetrants and the wall/floor opening. Mortar to be mixed at a rate of 1 part dry mixture to 0.8-1 part water by weight in accordance with the installation instructions supplied with the product.



Installation Guide UL System No.C-AJ-2935

Floor or Wall Assembly

Min114mm(4-1/2inch) thick reinforced normal weight (2320-2480kg/m³ or 145-155 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max diam of opening shall be 200mm(7-7/8inch).

Through Penetrant

One nonmetallic pipe or tubing installed concentrically within the opening. The annular space within the firestop system shall be a nom 43mm(1-3/4inch). Penetrant to be rigidly supported on both sides of floor or wall. The following types and sizes of nonmetallic pipes or tubing may be used:

A. Polyvinyl Chloride (PVC) Pipe

Nom 102mm(4inch) diam(or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process of supply) piping systems.

Firestop System – The details of the firestop system shall be as follows:

A. Fill, Void or Cavity Materials – Firestop Mortar – Min 114mm(4-1/2inch) thickness of fill material installed flush with both surfaces of floor or wall to completely fill the gap between all the penetrants and the wall/floor opening. Mortar to be mixed at a rate of 1 part dry mixture to 0.8-1 part water by weight in accordance with the installation instructions supplied with the product.
B. Fill, Void or Cavity Materials – Firestop Sheet-BP – Min 5mm(1/4inch) thick by 60mm(2-3/8inch) deep of fill material applied within the annulus, extending 10mm(7/16inch) beyond the top surface of floor or both surfaces of wall.



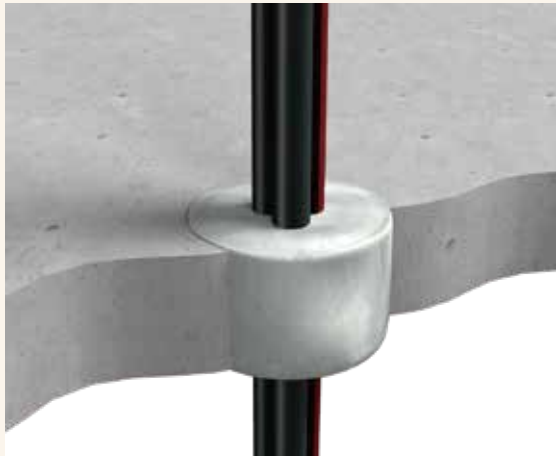
03

Firestop Putty-KP

Firestop systems for cable penetrations



The optimum material / installation method for round shaped openings with diameter up to 150mm and small size cables.



UL System No. C-BJ-3035

Firestop Putty-KP is a highly heat resistant and high fireproof gap sealing material. Firestop Putty-KP filled up in an opening, through which cables pass through a fire protection section in a building, prevents the fire to transmit the cables.

Excellent fireproof performance.
(2 hours fireproof)

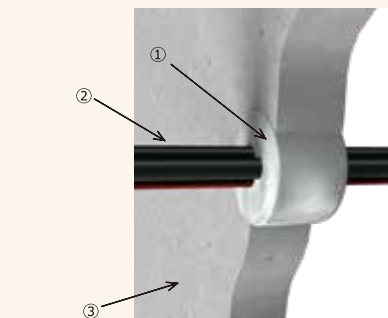
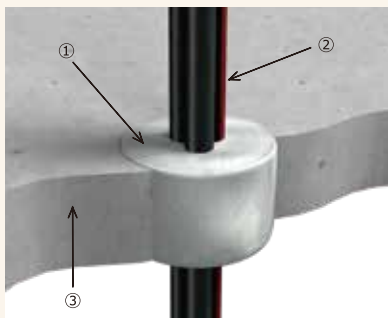
2 hours fireproof performance has been certified. (UL System No. C-BJ-3035)

Soft and easy to fill.

With moderate softness and stickiness, it compatibly adheres to various building materials.

Extremely lightweight and easy for installation.

It is easy to carry and install, then economical. Since it will not harden after construction, it is easy to re-install.

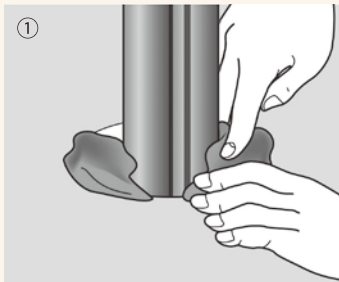


Technical Data

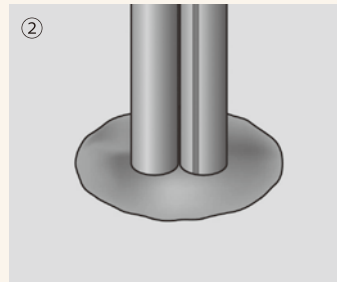
- | | |
|--|---|
| ① Firestop Putty-KP | ② Cables |
| Use application: | ③ Concrete floor or wall |
| Fireproof putty to fill up a space between the cables and the opening. | (Refer to Installation Guide for details) |

- a) Color: Gray
- b) Consistency: 60 ± 15 (JIS)
- c) Relative density (Specific gravity): 0.95 g/cm³
- d) Flame retardancy: Oxygen index 26 or higher
- e) Heating loss: 105°C to 110°C, 3 hours, 1% or less (JIS)
- f) Electrical insulation: Volume resistivity 6.7x10¹¹ W×cm
- g) Accelerated weathering resistance: No abnormalities after 6000 hours of testing in Super UV Tester
- h) Water resistance: No abnormalities after immersion in tap water (room temperature) for 144 Hr
- i) Effects on metal: No abnormalities when applied to Al, Cu, Pb, Fe, stainless steel, and brass (60°C x 336 Hr)
- j) Effects on resin: No abnormalities when applied to polyethylene, cross-linked polyethylene, and PVC (60°C x 336 Hr)

Installation Procedure



- ① Get rid of dirt on the cables and opening, and fill up with the putty.



- ② Fill up to the full thickness of the floor or wall (filling thickness 150 mm or more), and finish by smoothing the surface.

Installation Guide UL System No. C-BJ-3035

Floor or Wall Assembly

Min 150 mm (6inch) thick reinforced lightweight or normal weight (1600-2400 kg/m³ or 100-150 pcf) concrete floor or wall. Wall may also be constructed of any UL Classified Concrete Blocks. Max diam of opening 150 mm (6inch).

Cables

Aggregate cross-sectional area of cables in opening to be max 47 percent of the aggregate cross-sectional area of the opening. Cables to be centered within the opening and rigidly supported on both sides of floor or wall assembly. Any combination of the following types and sizes of copper conductor cable may be used:

- ① Max 3/C No. 2/0 AWG (or smaller), ② Max 2/C No. 10 AWG (or smaller) copper conductor power cables with PVC insulation with PVC jacket, ③ Max 30/C No. 12 AWG (or smaller), ④ Max 2/C No. 16 AWG (or smaller) copper conductor control cables with PVC insulation with PVC jacket, ⑤ Max 122.7 mm² Fiber Optic (F.O) cables with PE insulation and jacket, ⑥ Max 50 pair No. 19 AWG (or smaller), ⑦ Max 1 pair No. 22 AWG (or smaller) copper conductor telecommunication cables with PE insulation and PVC jacket, ⑧ Max 30.2 mm² coaxial cables with PE insulation with PVC jacket, ⑨ Max 4 pair No. 24 AWG (or smaller) copper conductor data cables with PE insulation and PVC jacket.

Firestop System — The firestop system shall consist of the following:

A. Fill, Void or Cavity Material — Firestop Putty-KP — Min 150 mm (6inch) thickness of fill material applied within the annulus, flush with top and bottom surface of floor or with both surfaces of wall.

Fireproof Certification

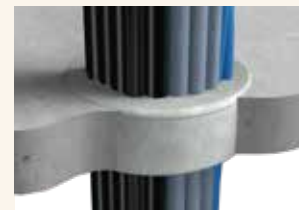
UL System No. C-BJ-3035

ANSI/UL 1479(ASTM E814)

Fire Rating 2Hr

CAN/ULC S115

Fire Rating 2Hr



Storage and use conditions

- (1) Avoid exposure to direct sunlight or high humidity. Store the product in a room at 40°C or less.
(2) Do not use the product in areas or parts continuously immersed in water or in contact with oil.
(3) Read the precautions printed on the product or the SDS, etc. for additional and detailed information.



Sales unit, Packaging

500g in polyethylene bag

Carton: 10kg corrugated cardboard carton (500g in bag x 20)



Flame-spread prevention materials for building wires

In order to prevent fire spread and to protect important equipment and production activities from the risk of fire. We propose the simplest and easiest way to render the cable flame-retardant.

01

PROTECO™ SHEET

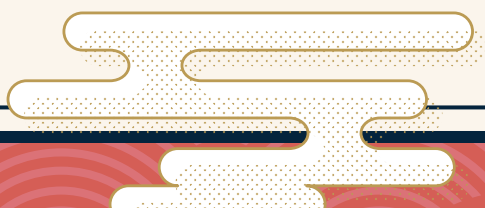
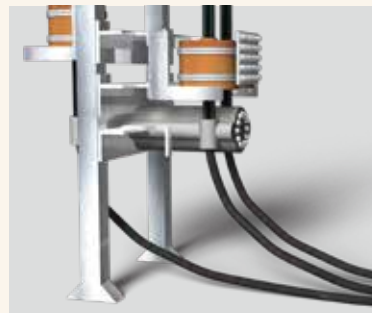
P16-18



02

PROTECO™ TAPE

P19-20



01

PROTECO™ SHEET

Flame-spread prevention sheet for building wires

In order to prevent fire spread and to protect important equipment and production activities from the risk of fire.



PROTECO™ SHEET is thin and lightweight fire retardant rubber, which can be easily wound onto the cable or cable tray to prevent fire spreading on the cable line and has been adopted for many years at major facilities throughout the country.

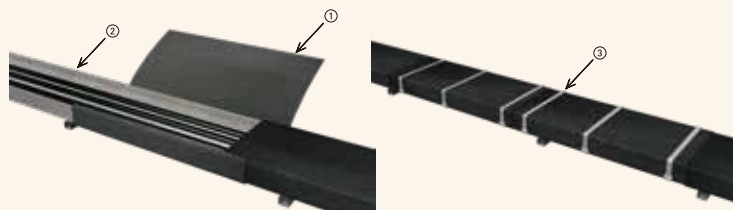
One round winding provides the sufficient fire spreading prevention performance.

Workability is improved as the product affixed easily, so the installation time can be greatly reduced.

Halogen free and low smoke material.



Technical Data



① PROTECO™ SHEET

Thickness : 0.4mm

Width : 1m

Length : 5m or 10m

② Wires, cables, cable trays

③ Belts

Flame propagation prevention performance

UL Verified Mark

ANSI/UL 1685

Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables referenced in Article 725.179 of the National Electrical Code (NEC).

Sales unit, Packaging

Sales unit (roll) Size : 0.4mm (t) x 1m (w) / roll (L10m)

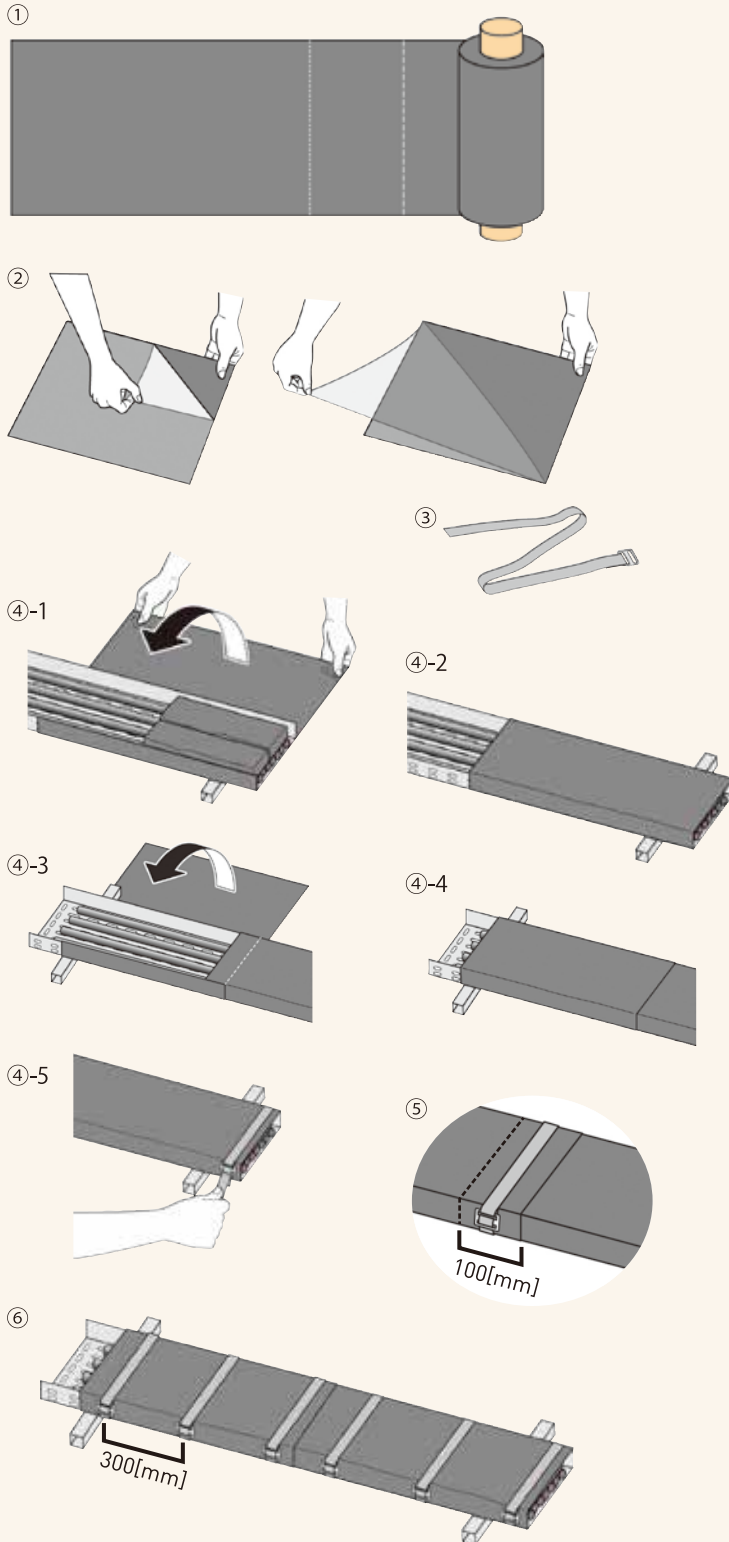
0.4mm (t) x 1m (w) / roll (L5m)



PROTECO™ SHEET

Flame-spread prevention sheet for building wires

Installation Procedure



① Measure the dimension of the bunched cables(+100mm) or the cable trays, and measure the sheet for the cutting dimension.

*Cutting dimension X = L (Covering size) + 100[mm]

② Remove the film.

③ Length of belts need to be 200[mm] longer than the total wrapping length of the cables.

④ Wrap the cables or the cable trays following steps ④1-5 and tie up the belts in order to fix the sheet.

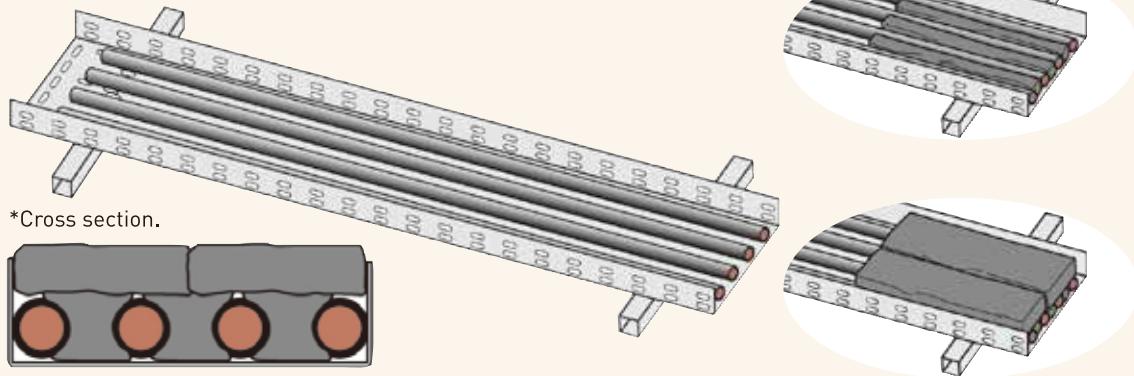
⑤ The sheet needs to be overlapped on the other side of the sheet for more than 100 [mm] to prevent water entry. The wrapping must be started from the bottom side to the upper side as shown in the circled figure.

⑥ Tighten the belts in every 300[mm] length as shown in the figure. Also tighten the belts where the sheets are overlapped.

Repeat these steps until all cables are completely wrapped.

If interspace between the cable tray at the start portion and the end point is formed the interspace shall be filled with the fire retardant sealing material, the rock-wool-board or Block to eliminate the interspaces.

Reference drawing



Acquired the first UL Verified Mark as the fire spread prevention products of cables.

About the UL1685

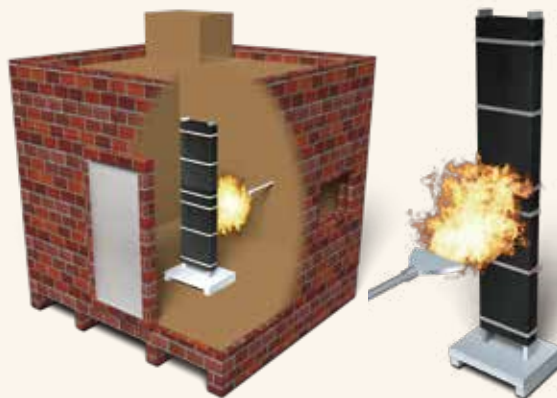
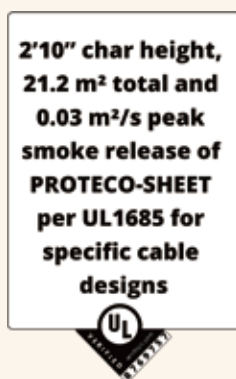
ANSI/UL1685 is the Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables. It measures cable char height for each specimen from the bottom of the cable tray to the highest char point of the cable covering after flame exposure.

About the UL Verified Mark

"The UL Verified Mark is issued once a marketing claim is Verified by UL in an objective and science-based manner. The Verified Mark can be used on product, packaging and promotion and is available for products, systems processes, facilities and more with Verified marketing claims.

Specific information about each Verified marketing claim is publicly available at UL's online database UL Verify at [verify.UL.com](https://verify.ul.com). The Verified Mark has been issued to products such as TVs, monitors, notebook computers, LED lighting equipment and many others."

<https://news.ul.com/news/ul-issues-first-wire-and-cable-verified-mark-japan>

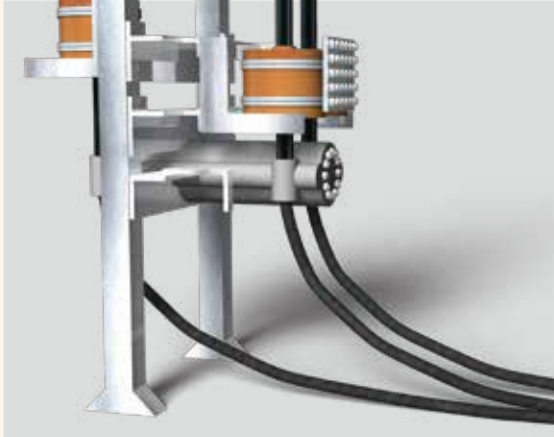


*modified illustration from UL1685 Figure 5.1

02

PROTECO™ TAPE

Flame-spread prevention tape for building wires



In order to prevent fire spread and to protect important equipment and production activities from the risk of fire, we propose to wrap PROTECO™ TAPE around a single wire or a cable as the countermeasure.

Wrap the surface of the single cable to render the cable fire retardant and resistant. Overlap the half width of the tape, and when the first layer is completed, apply the upper layer.

The fire protection layer with the high fire retardancy is formed, and the excellent performance in prevention of fire spreading/catching is provided.

It adheres well to cables, also is flexible and well follows the thermal expansion and contraction of the cables.

The current carrying capacity of the cable is hardly reduced.

The cable is easily wrapped around and coated in the uniform thickness.

Technical Data

PROTECO™ TAPE

Use application

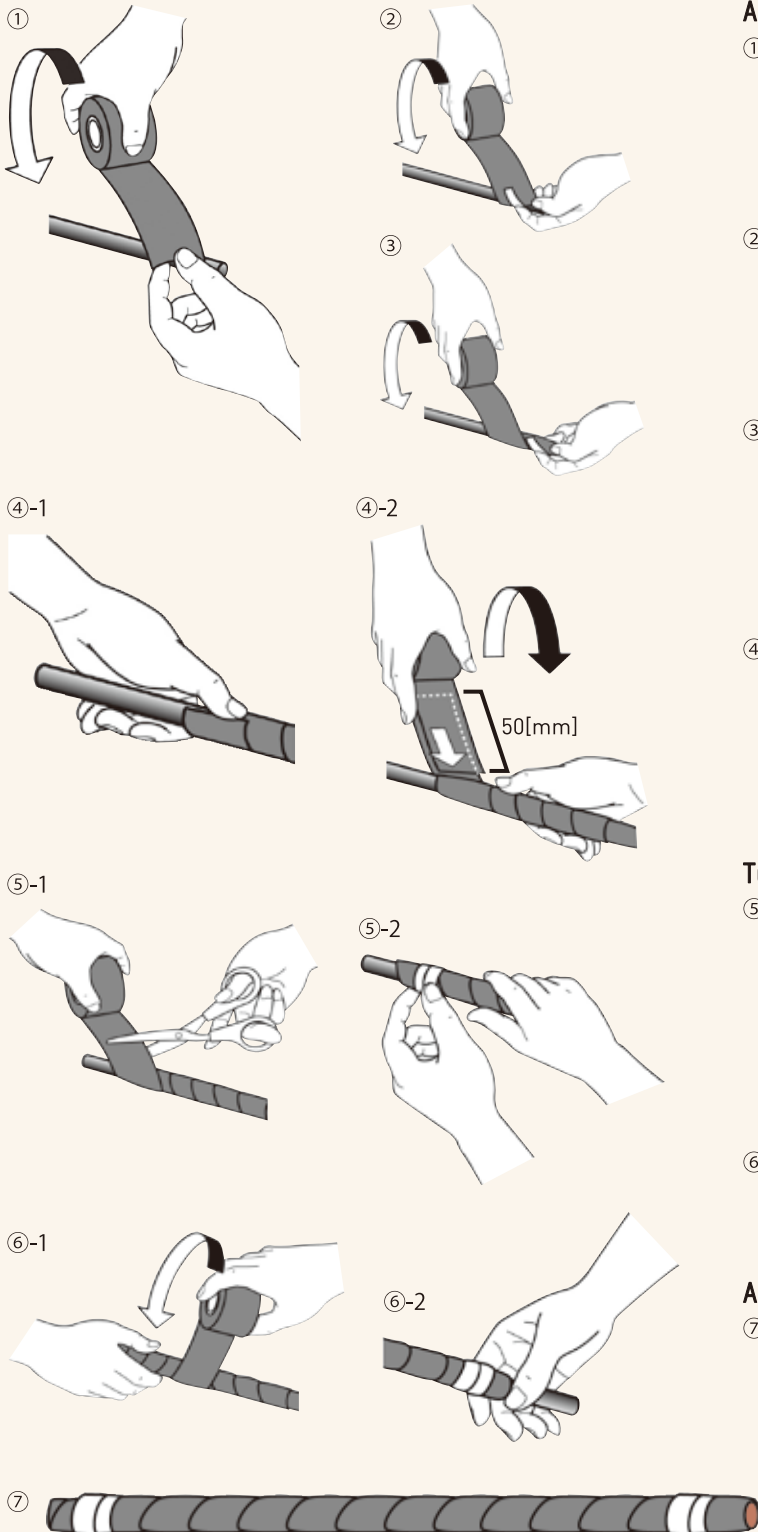
Fire spread prevention : In order to protect important equipment and production activities from the risk of fire by wrapping PROTECO™ TAPE around the wire or the cable.

Thickness : 0.7mm / Width : 50mm / Length : 5m

Sales unit, Packaging

Quantity per box	Box dimension (mm)	Box weight (kg)	Sales unit (Box)
50	180×440 ×280	18	1

Installation Procedure



At the beginning

① Wrap around the cable with the tape in half width overlapping, and after completing the first layer, apply the upper layer.

② To make your work easier, it is recommended to stabilize the tape by using a plastic tape at the beginning of the wrapping point.

③ Pull the tape until the width of the tape is reduced by around 2~3mm and wrap it around the cable.

*Make sure that there is no interspace between the tape and the overlapped tape.

④ When the roll of the tape is used up before finishing the wrapping, just continue to wrap around with a new tape. The new tape must be overlapped by 50mm under the already used tape.

Turning back point

⑤ Cut the tape. It is recommended to stabilize the wrapped tape by applying a plastic tape.

Overlap the tape for 2 to 3 times perpendicularly. And change the tape direction to backward.

⑥ Repeat the same wrapping work as the first layer up to the starting point.

At the end

⑦ Overlap the tape for 2 to 3 times perpendicularly. And stabilize the tape by applying the plastic tape.

Other Material

01

EG-P

P22

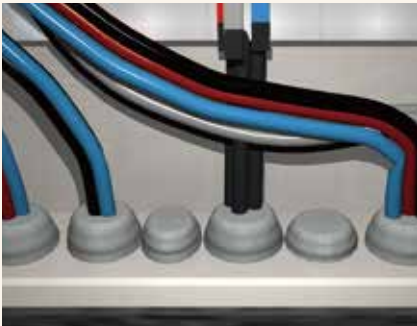


01

EG-P DUCT SEAL COMPOUND

Super light-weight & Multiuse Putty

To seal openings from air, water or dust.
Excel at various openings filling in indoor and outdoor.



For Cable Openings



For Control Panel



For End Of Conduit

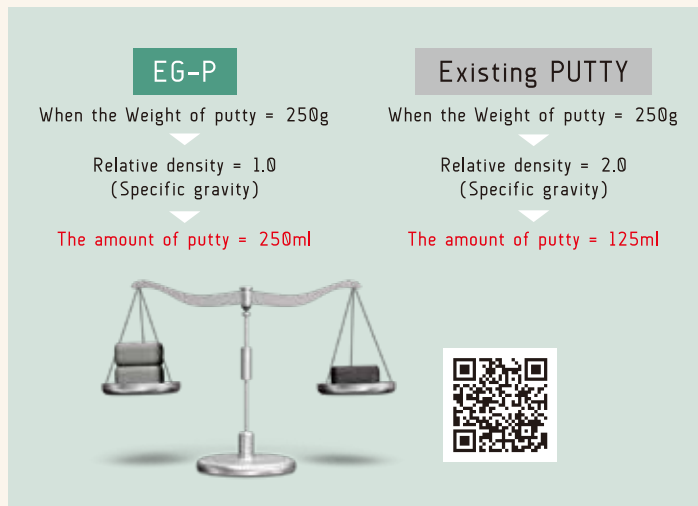
Excellent in water resistance and weather resistance. Super lightweight and easy to install. "Easy Putty"
Excel at various holes filling in indoor and outdoor locations.

Good Workability

Good workability with the non-sticky and lightweight putty. Easy to remove and re-install due to the non-curable type.

Applicable to various places

Usable both in indoor and outdoor places for its excellent water resistance and weather resistance. Applicable to various places.



Technical Data

- ① Color : Gray
- ② Consistency : 60 ± 15 (JIS A 5752)
- ③ Relative density (Specific gravity) : 1.0 ± 0.1 (Conform to Pycnometer and Hydrostatic Method) (Water=1)
- ④ Flame retardance : None
- ⑤ Insulation (Ordinarily $\geq 10^9 \Omega \text{ cm}$) : 3.6×10^{12}
- ⑥ Heat conductivity (W/m · K) : 0.35
- ⑦ Accelerated weathering resistance : No abnormalities after 6,000 hours of testing in Super UV Tester
- ⑧ Water resistance : No abnormalities after immersion in tap water (room temperature) for one month
- ⑨ Effects on cable sheathings : None
- ⑩ Effects on metals : None

Storage and use conditions

- (1) Avoid exposure to direct sunlight or high humidity. Store the product in a room at 40°C or less.
- (2) Do not use the product in areas or parts continuously immersed in water or in contact with oil.
- (3) Read the precautions printed on the product or the SDS, etc. for additional and detailed information.

Sales unit, Packaging

250g (250ml) in polyethylene bag

Carton: 1.25kg corrugated cardboard carton (250g in bag x 5)





FURUKAWA TECHNO MATERIAL CO., LTD.

5-1-8 Higashi-yawata, Hiratsuka-city
Kanagawa pref., 254-0016, JAPAN
URL: <http://www.furukawa-ftm.com/>

