Year after year, fires continue to occur in telephone exchange buildings around the world. The effects of these fires and the smoke they create can leave local exchanges disabled for hours or even days. As the importance of communication increases each year, the need for fire protecting the telephone exchange buildings and systems becomes increasingly critical. Although it is unlikely that fires will ever be eliminated, there are products and associated systems available today which can control the extent of the fire spread; thereby minimizing the service downtime, property damage and even harm to building workers.

The two common methods of controlling fires today involve active and passive fire protection systems. While active systems (such as sprinklers and clean extinguishing agents), can be effective in extinguishing a fire, passive fire protection systems must be used in conjunction with active systems to prevent smoke spread, eliminate the possibility of fire spread before the active system becomes activated, and to seal openings for halon and halon alternative systems. 3M Fire Protection Products Group has spent the last decade developing products and systems specifically designed as passive fire protection for penetration seals in telephone exchange buildings.
3M Fire Protection Products and Systems have been thoroughly tested and evaluated by independent testing agencies, including UL and FM, for a variety of telephone applications involving passive fire protection. All of 3M's Fire Protection Systems have been carefully designed to provide the following benefits:

- 2 hour fire ratings
- Smoke sealing before and during a fire event
- Excellent aging resistance
- Seismic resistance
- Systems specific to the telephone industry
- Fast and simple installations (no special tools required)
- Clean installations (free of dust, easy clean up)
- Asbestos-free products
- Easily verified products
- Single-side installations

The most common applications include fire-rated penetration seals for slots in floors, cable racks, fiber optics, and overnight protection for cable access holes. Following is a description of the requirements and features of each of these applications.
Slots in the Floor

Slots in the floor are typically long rectangular openings through concrete and can be up to 10 inches (250 mm) wide. These slots provide access for switchboard cables and they are often located in difficult access areas, such as underneath mainframe equipment. Some slots are located in easy to access areas as a result of removed equipment or when beneath switching relay racks. Fire protection of slots require a 2 hour "F" rating and a minimum of 1 hour "T" rating as described in the ASTM E 814 Standard.

The 3M Solution:

3M has several systems used for slots in the floors. There are two common ways of covering these slots. For slots which are underneath mainframes or otherwise difficult to access, the typical installation method involves first applying "Z" clips to each side of the opening, and then filling the bottom of the opening with ceramic fiber. On top of the ceramic fiber, 3M CP 25WB+ Caulk is applied to finish the system. This system is shown in Option A in Fig. 1.

For slots which are easily accessed, the most common system involves first applying the 3M Moldable Putty around each cable or cable bundle (if cables exist), and then cutting a sheet of 3M Fire Barrier CS-195+ to fit around the putty and cover the opening. The CS-195+ Sheet is then attached to the concrete to complete the system. This system is shown in Option B in Fig. 1. Both options in Figure 1 are valid for power cables and signal cables.

![Diagram](image_url)
Slots in the Floor Continued...

Fig. 1, Option B
Cable Rack Penetration Seals

Cable racks pass through rectangular concrete floor openings and typically carry power or signal cables. Usually, these cable racks are surrounded by a steel riser that is attached around the perimeter of the opening. The cable rack penetration seals require 2 hour “F” and “T” ratings as described in the ASTM E 814 Standard. In some cases, positive pressure smoke sealing is also required.

and cover the opening. After the sheets are attached with the appropriate fasteners, 3M Moldable Putty is used to fill any openings between the sheets and the cables/cable rack. Moldable Putty can also be used as a smoke seal around the perimeter of the opening. (When a positive pressure smoke seal is required, each cable must be wrapped individually with a layer of the 3M Moldable Putty prior to the attachments of the top sheet of CS-195+.) If necessary, a steel cover plate may be placed over the top sheet of CS-195+ as a means to provide support for workers to stand on the system. This system is shown in Fig. 2 and is valid for both power cables, signal cables, and blank openings.

The 3M Solution:

3M has several systems available for cable rack penetration seals. The most common system involves first cutting two sheets (top and bottom of the opening) of the 3M Fire Barrier CS-195+ to fit around the cables and the cable rack.

![Diagram of cable rack penetration seal system](image)

Fig. 2
Fiber Optic Penetration Seals

Fiber Optic penetration seals can occur in both floors and walls. Typically, the fiber optic cables are surrounded by PVC or polyethylene inner ducts which protect the cables from damage during installation. The fiber optic penetrations can occur in both large or small openings. Fire protection of these penetration seals require 2 hour “F” and “T” ratings as described in the ASTM E 814 Standard.

The 3M Solution:
3M has several systems for fiber optic penetration seals. The most common involves first applying a layer of the 3M FS-195+ Wrap Strip around each end of the inner duct and then sliding it into the wall or floor. Next, to form a smoke seal, 3M Moldable Putty is applied inside the exposed ends of the inner duct and around the inner duct where it contacts the FS-195+ Wrap Strip. This system is shown in Fig. 3 and is valid for both power cables and signal cables.
Overnight Cable Access Holes

Overnight cable access holes (overnight closures) are typically cable rack penetration seals which must be easily removed to facilitate further work on the cable systems the following day. Like the cable rack penetration seals described earlier, overnight cable access holes for cable racks involve rectangular concrete floor openings and typically carry power cables, signal cables, or blank openings. Usually, these cable racks are surrounded by a steel riser that is attached around the perimeter of the opening. The overnight cable access holes require 2 hour “F” ratings as described in the ASTM E 814 Standard. In some cases, a positive pressure smoke seal is also required.

The 3M Solution:

3M has several systems used for overnight cable access penetration seals. The most common involves first cutting a sheet (top only) of the 3M Fire Barrier CS-195+ to fit around the cables and the cable rack, and cover the opening. To facilitate quick disassembly to allow work on the cable system the following day, the sheets of CS-195+ are held in place under compression using “C” clamps attached to the steel riser. 3M Moldable Putty is then used to fill any openings between the sheets and the cables/cable rack. (When a 100% smoke seal is required, each cable must be wrapped individually with a layer of the 3M Moldable Putty prior to the attachments of the top sheet of CS-195+.) This system is shown in Fig. 4 and is valid for both power cables and signal cables, and blank openings.

Fig. 4

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CABLE RACK

3M FIRE BARRIER MOLDABLE PUTTY
STEEL COVER PLATE (OPTIONAL)

"C" CLAMPS

3M FIRE BARRIER CP 25WB+ CAULK
or MOLDABLE PUTTY

3M FIRE BARRIER CS-195+ COMPOSITE SHEET

CABLE BUNDLE
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3M Fire Protection Products

The 3M products used in the systems just described include the following:

**3M Fire Barrier CS-195+ Composite Sheet**
Intumescent sheet used to fire-stop large openings. Seals penetrations against flame spread, smoke and toxic fumes. This composite sheet has multiple applications, including through-penetrations of multiple cable, pipe and ducts.

- Easy to handle, cut and form to desired shape using common tools
- Expands up to 10 times
- Easy to fasten, bolt, punch or drill
- Thermally conductive, allowing unwanted heat build-up to escape
- Non-flame supporting
- UL Classified and FM Approved
- Cost-effective, high performance versus installed cost
- No mixing or damming – easy to install
- 1/4 inch (6.35 mm) composite sheet provides up to a 4-hour “F” fire rating
( Flame Spread 5.0, Smoke Development 50)

**3M Fire Barrier FS-195+ Wrap/Strip**
Flexible intumescent sheet used to firestop difficult penetrations such as plastic and metal pipe, conduit, insulated pipe, bus duct, glass pipe and insulated cable. When exposed to heat, this rubber-like strip expands up to ten times its original volume, forming a very hard char to seal off the migration of fire and smoke.

- One-part, organic/inorganic, fire-resistive elastomeric sheet with aluminum foil on one side
- Intumescent for complete, rapid sealing during a fire
- Easy to install, cost-effective
- Versatile - can be cut to fit irregular shapes
- Flexible, easy to handle and lightweight
- Seals telephone cable, metal pipe, plastic pipe, conduit, insulated metal pipe and blank penetrations
- Used to fire-stop up to 10 inch (254,0 mm) diameter PVC pipe
- UL Classified for use on PVC, CPVC, ABS, PP and PB pipes and cables
( Flame Spread 5.0, Smoke Development 50)

**3M Fire Barrier Moldable Putty**
Even before any temperature rise occurs from a fire, 3M Moldable Putty provides a draft and cold smoke seal in the installed condition. It adheres to all common building surfaces, including cement, gypsum, wood, plastic--even metal. Use it to seal construction gaps, cable, insulated pipe, electrical conduit, electrical boxes and metal pipe. 3M Moldable Putty seals against air draft, smoke, noxious gas and flame propagation.

- Intumescent and endothermic
- One-part
- Hand moldable
- Openings sealed with 3M Moldable Putty are easy to re-enter
- Provides up to a 3-hour “F” fire rating
- Convenient pad and stix form
( Flame Spread 2.5, Smoke Development 0)

**Fire Barrier CP 25WB+ Caulk**
CP 25WB+ Caulk is a synthetic elastomeric premium latex designed for use as a one-part fire, smoke, noxious gas and water sealant. In addition, the unique intumescent property of this material (expands when heated) means that as cable or pipe insulation is consumed by fire, CP 25WB+ Caulk expands to tightly seal the penetration.

- Halogen-free
- Superior adhesion
- Freeze-thaw stability
- Mild pH
- Minimal shrinkage
( Flame Spread 0, Smoke Development 5.0)
3M Fire Protection Applications

In addition to the systems just described in this brochure, 3M has fire protection systems approved for the following applications:

- Retrofit fire protection systems
- Plastic pipes/conduits
- Metal pipes/conduits
- Insulated pipes
- Cable bundles
- Cable Trays
- Bus Ducts
- Glass Pipes

Working closely with the major telephone companies, 3M has gained a unique understanding of the special fire protection requirements of the telecommunication industry. As a result, 3M Fire Protection Products and Systems have been proven to meet the industry’s highest standards. These 3M Products and Systems are currently the standard or the proposed standard at every Regional Bell Operating Company (RBOC) and large independent telephone companies and major installers.

Additional information in the form of videotapes, installation procedure and drawings are available from 3M Fire Protection Products. To obtain a list of available information and other assistance, please dial the 3M Fire Protection Hotline at 1-800-328-1687.

Technical Support

Every 3M Firestopping product is backed with the experience and unmatched technical service of 3M. 3M also has the most extensive Applications and Specifier’s Guide of UL Classified systems in the industry.
Important Notice to Purchaser

LIMITATION OF REMEDIES AND LIABILITY: If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OR REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M SHALL NOT OTHERWISE BE LIABLE FOR LOSS OR DAMAGES, WHETHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, INVESTMENT, GOODWILL OR BUSINESS OPPORTUNITY), REGARDLESS OF THE LEGAL THEORY ASSERTED, INCLUDING NEGLIGENCE, CONTRACT, WARRANTY, OR STRICT LIABILITY.

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