

# **3M Brand Fire Protection Products**

## **Fire Tests of 3M Brand Fire Barrier Moldable Putty Pads and CS-195 Composite Sheet For Two Hour Concrete Floor Applications in the Telecommunications Industry**



## Title:

FIRE ENDURANCE TEST (ASTM E814-83)  
DESIGNS 3M FT 88-01, 88-02, 88-03  
FM J.I. IP2A2.AC

## Summary:

This was a fire endurance test of three floor assemblies containing 3M firestops. One assembly contained through penetrations of communications cable, the second contained power cable and the third was a blank with no through penetrating items. The construction and fire test of each assembly was witnessed by a representative of Factory Mutual Research Corporation.

The objective of this test program was to investigate the fire endurance properties of each firestop construction. Each test was conducted in accordance with the Standard Method of Fire Tests of Through-Penetration Firestops, ASTM E814-83

## Fire Tests:

The fire tests for determining the fire endurance of the firestops was conducted at the 3M Fire Test Center located at 3M Chemolite, Bldg. 66, Cottage Grove, MN.

Fire tests were conducted on the Ceramic Materials Department large scale, top loading, propane gas fired furnace. Each floor assembly containing the firestops was normal weight concrete 70 in. x 56 in. x 8 in. (1,78m x 1,42m x 203,2mm) thick. Furnace pressure was positive during the fire tests.

A sketch of each firestop construction is shown in the illustrations.

## Test Data:

Each floor containing the firestops was subjected to fire exposure. The temperatures in the furnace followed the Standard Time-Temperature Curve as specified in ASTM E814. The fire exposure continued for 2 hours followed by a hose stream test. The water stream pressure of the hose stream was 30 psi, and it continued for 42 seconds uniformly over the area of the floor containing the fire stops.

## Conclusion:

Firestops FT 88-01 (communications cable) FT 88-02 (power cable) and FT 88-03 (blank) each satisfied the fire endurance and hose stream requirements of ASTM E814 for a 2 hour F rating.

The firestops tested achieved T ratings based on the transmission of heat through the firestops during the rating period. The T rating is determined by the rise in temperature on the unexposed surface of the firestop or on any penetrating item. The temperature rise cannot be more than 325°F (163°C) above the initial temperature.

The ASTM E814 rating achieved by each stop is as listed below:

Fire Stop	T Rating
FT 88-01 (Communication Cable)	2 hr.
FT 88-02 (Power Cable)	1 1/2 hr.
FT 88-02 (Blank)	2 hr.

The firestops also achieved Factory Mutual (FM) approval ratings based on the transmission of heat through the firestops during the rating period. The FM rating is determined by the rise in temperature on the unexposed surface of the firestop material 1" from the penetrating item. The temperature rise cannot be more than 325°F (163°C) above the initial temperature.

The FM rating achieved by each stop is as listed below.

Fire Stop	FM Rating
FT 88-01	2 hr.
FT 88-02	2 hr.
FT 88-03	2 hr.

A formal approval report will be issued by Factory Mutual under Job Identification No. 1P2A2.AC.

## Procedure:

The 3M Firestops are designed to be installed from the top side of the floor assembly. 3M Fire Barrier CS-195 Composite Sheet was cut and fit to the bottom of the seal. **The bottom CS-195 Composite Sheet was installed foil side up** and was attached to industry standard support stirrups using mechanical fasteners.

3M Fire Barrier Moldable Putty Pads were then applied around the perimeter of the opening between the CS-195 Composite Sheet and the wall interface. Moldable Putty Pads were also applied at the interface of the cable bundle and the CS-195 Composite Sheet, filling all voids.

The top CS-195 Composite Sheet and industry standard steel cover plate were cut and fit to the top of the seal. **CS-195 Composite Sheet was installed foil side down.** The top CS-195 Composite Sheet and steel cover plate were mechanically fastened to the sheathing frame (riser).

Moldable Putty Pads were applied totally around the cable bundle and at the interface of the cable bundle and CS-195 Composite Sheet.

The blank opening was installed in the same manner, minus the cable sealing procedure.

In all floor applications, industry standard metal stirrups, sheathing frame (riser), and 1/8 in. (3,2mm) steel cover plate were used.

## 3M Materials Used:

3M Fire Barrier

Moldable Putty Pads

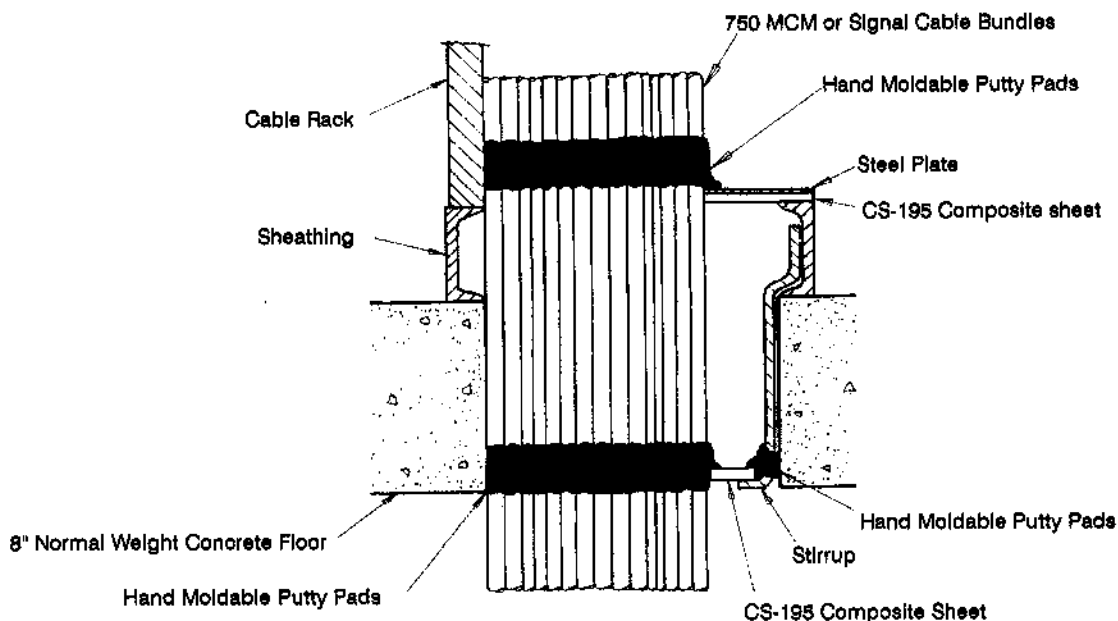
4 in. x 8 in. x 1/8 in. (101,6mm x 203,2mm x 3,2mm)

3M Fire Barrier

CS-195 Composite Sheet

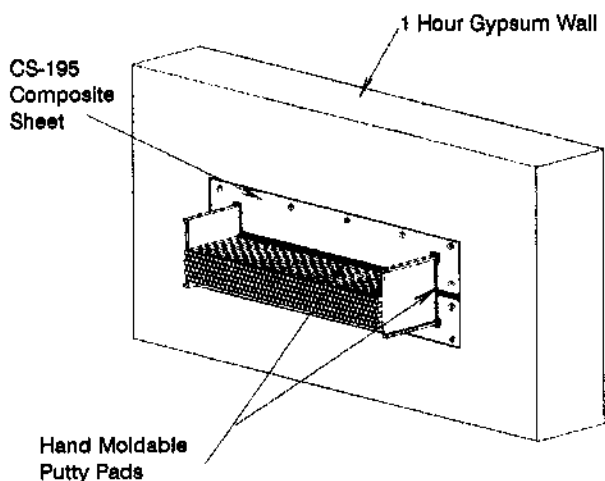
41 in. x 36in. (1,04m x 914mm)

**Cable Bundle Penetration Seal**



**2 Hour Rating**

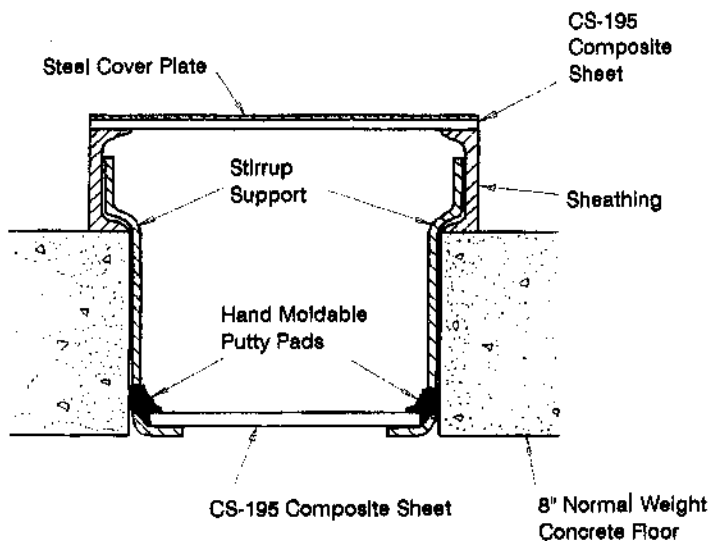
**Cable Tray Penetration Seal**



(Note: Penetration Seal Installed on *Both Sides* of Wall)

**1 Hour Rating**

**Blank Penetration Seal**



**2 Hour Rating**

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3M Brand Fire Protection Products

**Penetration Seals  
Cable Bundle, Blank Penetration &  
Cable Tray  
Concrete Floor & Gypsum Wall  
CS 195 / Moldable Putty Pads**

**3M/St. Paul**

1 & 2 Hour Ratings

## Features of the 3M System include:

- Specifically designed for the Telecommunications industry.
- UL classified materials.
- Easy to re-enter and re-seal.
- No dust.
- Low installed cost.

Plus - 3M engineering, field support and fire test capability.

## Call The Leader, Call 3M

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**Factory  
Mutual  
System**

**Approved**



FILL, VOID OR CAVITY MATERIALS  
CLASSIFIED BY  
UNDERWRITERS LABORATORIES INC.®  
FOR USE IN THROUGH-PENETRATION  
FIRESTOP SYSTEM NOS 202, 203, 204  
90G9  
SEE UL BUILDING  
MATERIALS DIRECTORY



Electrical Circuit Protective Materials  
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For Use in Electrical Circuit Protective Systems  
System Nos. 2, 3, 4, 6, 7, 8, 9

FILL, Void or Cavity Material  
Classified By  
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For Use in Through-Penetration  
Firestop System Nos 81, 84, 92, 93, 99, 102, 105, 136, 138, 139, 159, 160  
See UL Building Materials Directory

**3M Ceramic Materials Department**

3M Center Bldg. 225-4N-07  
St. Paul, MN 55144-1000

**3M**