



3M™ CS-195+ Composite Sheet

Product Description

3M Fire Barrier CS-195+ Composite Sheet is a one-part composite system comprised of four components. The heart of the system is an organic/ inorganic, fire-resistive elastomeric sheet. It is bonded on one side to a layer of 30 gauge galvanized steel. The other side is reinforced with hexagonal shaped steel-wire mesh and covered with aluminum foil. CS-195+ Composite Sheet is designed to seal larger penetrations through fire-rated walls and floors. It is also used for shielding cable trays and conduit, HVAC ductwork and vital process equipment from radiant heat, flame spread and smoke. CS-195+ Composite Sheet functions as an effective intermittent fire-break within horizontal and vertical cable tray runs, and is excellent for both new and retrofit construction.

The nominal 7.62 mm (0.3") thick composite sheet systems provide up to 4-hour fire ratings. It is lightweight and can be easily installed with common trade tools.

When exposed to temperatures in excess of 121°C (250°F), the fire-resistive sheet begins to volumetrically expand and swells 8-10 times its original size, forming a high strength, hard char that retards heat transmission. This expansion process is called 'intumescence.'

Under normal operating conditions, CS-195+ Composite Sheet is a good thermal conductor which allows unwanted heat build-up to escape from process and control equipment and also minimizes power cable derating.

Product Features

- Intumesces (expands with heat) to form a hard char that tightly seals penetrations against flame spread, smoke and toxic fumes
- Multiple applications – through penetration firestop, heat shield and firebreak protection
- Easy to install using common trade tools
- Lightweight – easy to handle, cut and form to desired shape
- Easy to fasten – bolt punch or drill through. Use self-tapping screws or anchor bolts
- Thermally conductive – allows unwanted heat build-up to escape
- Non-flame supporting
- Cost effective, high performance versus installed cost
- No mixing or damming – is clean to install
- Versatile: can be cut to fit irregular shapes
- Re-enterable
- Low odor
- Tested in accordance with AS1530.4, EN1366 and ASTM E814 (UL Listed).



Maintenance

3M Fire Barrier CS-195+ Composite Sheet remains stable for an indefinite period of time. CS-195+ Composite Sheet should be stored in the original shipping container until used.

The materials are non-impaired by freezing or storage at temperatures up to 86°C (187°F).

Physical Properties

Sheet Sizes

406.4 mm x 711.2 mm (16" x 28")

711.2 mm x 1320.8 mm (28" x 52")

914.4 mm x 609.6 mm (36" x 24")

914.4 mm x 914.4 mm (36" x 36")

914.4 mm x 1.041 mm (36" x 41")

Component	Thickness
Galvanized sheet steel	0.399 mm ± 0.076 mm (0.0157" ± 0.003 in.) 30 gauge
Fire-resistive sheet	7.24 mm ± 1.27 mm (0.285" ± 0.05")
Hexagonal restraining wire	20 gauge
Aluminum foil	0.0508 mm ± 0.00508 mm (0.002" ± 0.0002")
Complete material	7.70 mm ± 1.37 mm (0.303" ± 0.054")

A. Physical and Electrical Properties CS-195+ Composite sheet as installed

Normal Weight 13.4 kg/m² (2.75 lb/ft²)

Intumescent Activation Sequence

Expansion begins 150°C (302°F)

Significant expansion 177°C (350°F)

Weight loss (TGA) 20.1% @ 350°C (662°F); 31.0% @ 500°C (932°F); 53.2% @ 1000°C (1,832°F)

Expansion 8-10 typical

Intumescent Sheet Properties (as part of composite)

Domestic Strength (ASTD 149) 119 volts/mil average

Non-flame supporting hardness 45 to 65 Shore A

Tensile strength/elongation (ASTM D 412, Method A) 0.645 MPa (93.6 psi) /489%

Compression set 25% (maximum)

Surface Burning Characteristics ASTM E 84 (ANSI/UL 723) Flame Speed 5 Smoke Development 50

Availability

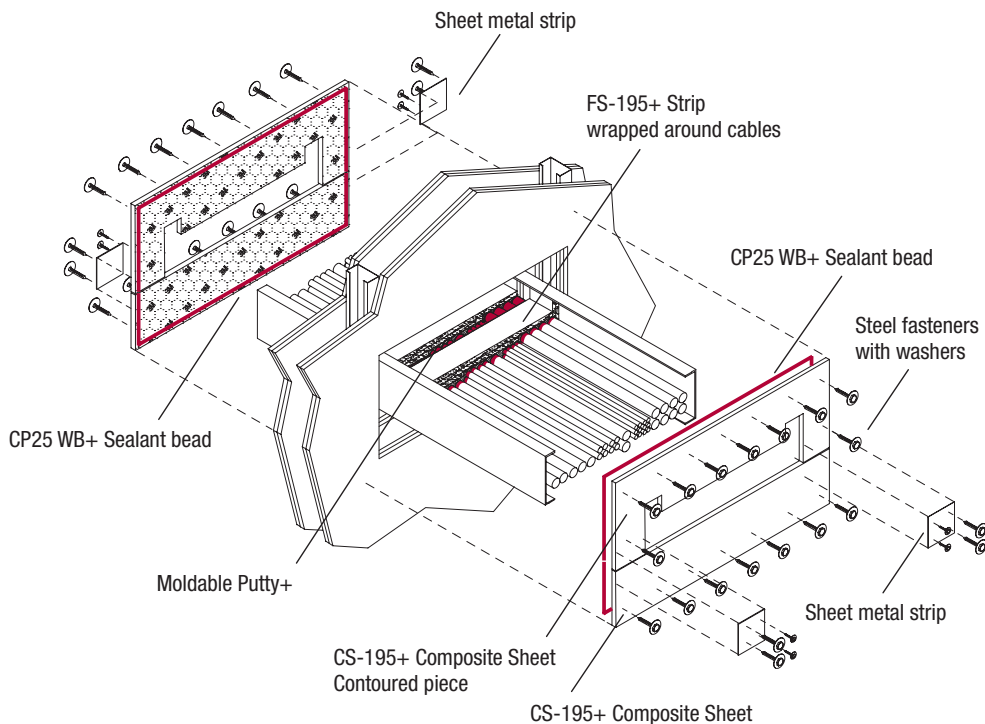
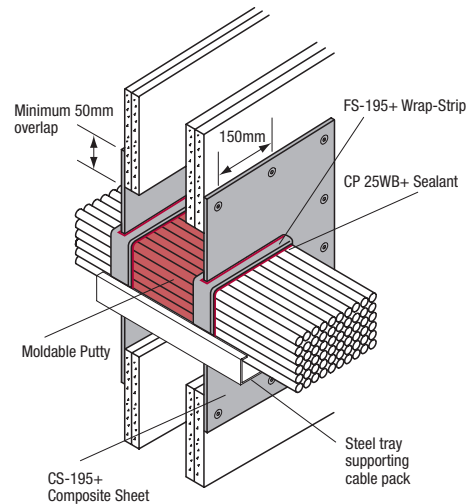
3M™ Brand Fire Barrier CS-195+ Composite Sheet is available from Authorized 3M Fire Protection Products Distributors.

3M Order Code	Packing	Unit/Case
98040026019	Boxed 406.4 mm x 711 mm (16" x 28")	1
98040029476	Boxed 711 mm x 1321 mm (28" x 52")	1
98040024071	Boxed 914.4 mm x 610 mm (36" x 24")	1
98040024089	Boxed 914.4 mm x 914.4 mm (36" x 36")	1
98040024097	Boxed 914.4 mm x 1041.4 mm (36" x 41")	1



Installation Techniques:

1. For drywall constructions, add metal framing to the top and bottom of the opening. If metal studs are used, the top (flat) surface should be facing toward and flush with the opening, and the channel of the stud should be facing into the wall cavity.
2. Wrap cables and metal pipes with a single layer of 3M Fire Barrier Moldable Putty+ Pad for the full depth of the seal.
3. Install 3M Fire Barrier FS-195+ Wrap/Strip around cables and metal pipes on both sides of the fire seal. Use steel wire to hold the FS-195+ Wrap/Strip in place.
4. Use cardboard, marking pencils and scissors to make templates of the exact size and shape of CS-195+ Composite Sheet pieces. Ensure that a 50mm overlap is allowed around the sides of the opening. The template will generally need to be made in at least two pieces. Plan the size of the first piece so only one piece requires contour cuts. The fewer pieces that need contour cuts, the quicker the installation will be.
5. Use a jigsaw to cut the CS-195+ Composite Sheet to the cardboard template.
6. Run a bead of 3M CP 25WB+ Sealant around the opening within 50mm of the edge.
7. Secure the CS-195+ Composite Sheet into place using 6mm steel fasteners with washers placed with 150mm spacing around the opening. Ensure that there is at least 50mm overlap around the opening.
8. Use 40mm wide steel sheet metal strips and sheet metal screws to cover the CS-195+ Composite Sheet seams.
9. Apply Fire Barrier CP 25WB+ Sealant around the cable tray and fill spaces between CS-195+ Composite Sheet and FS-195+ Wrap/Strip. Also, cover edges of the Wrap/Strip and fill any spaces that smoke would likely penetrate.



Performance Specifications for Installers

Australian Standard FRLs: 3M CS-195+ Composite Sheet				
Building Element	Blank (Unpenetrated) Seal	PVC Insulated Cables, Cable trays and Cable bundles	Copper or Steel Pipes Small* 15mm diameter or smaller 0.9mm wall thickness or thicker	Steel Pipes Small* 34mm diameter or smaller 3.5mm wall thickness or thicker
Floor: Concrete slab. <i>Minimum 120mm thickness</i>	-/240/120	-/180/30	-/240/-	-/240/-
Wall: Plasterboard Dry Wall. <i>Minimum 116mm thickness</i>	-/120/30	-/120/30	-/120/-	-/120/-
Wall: Solid masonry, hollow masonry or concrete construction. <i>Minimum 116mm thickness</i>	-/240/90	-/180/30	-/180/-	-/180/-



In order to achieve the above FRLs you must ensure that the CS-195+ Composite Sheet is installed as per the Installation Techniques and the building element you are installing into has an FRL performance equal to or better than that of the CS-195+ system. The Installation Techniques can be found on the final page of this document.

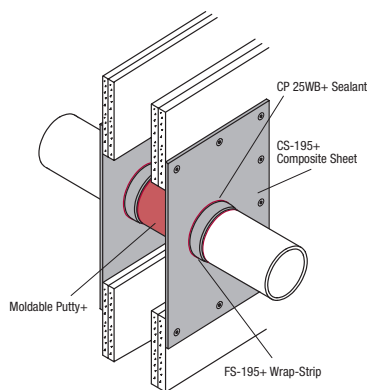
What does FRL mean?

FRL stands for 'Fire Resistance Level'. For example, an FRL of '-/240/120' indicates:

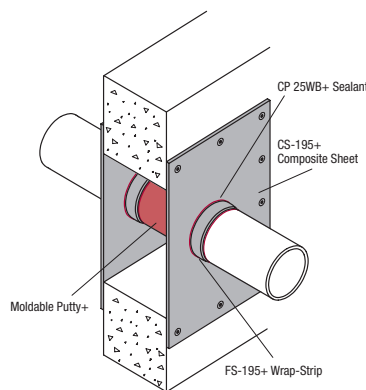
- **Structural Adequacy.** The first dash '-' indicates that CS-195+ is non load bearing
- **Integrity.** The middle number '240' indicates for how many minutes the CS-195+ system can resist the passage of flames and hot gasses
- **Insulation.** The last number '120' indicates how many minutes it takes the unexposed face to heat up by more than 140°C.

Metal Pipes*

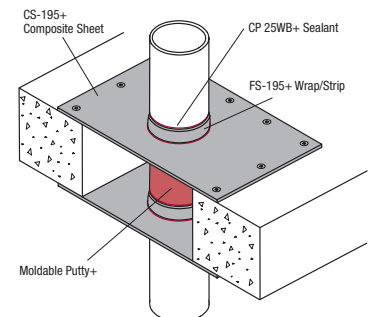
* With or without up to 19mm Armaflex insulation



Dry Wall 116mm
Copper: 15mm dia, 0.91mm wall: FRL: -/120/-
Steel: 34mm dia, 3.5mm wall: FRL: -/120/-



Solid Masonry, Hollow Masonry
or Concrete Wall 120mm
Copper: 15mm dia, 0.91mm wall: FRL: -/180/-
Steel: 34mm dia, 3.5mm wall: FRL: -/180/-

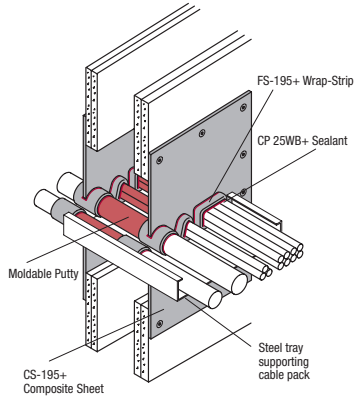


Concrete Floor 120mm
Copper: 15mm dia, 0.91mm wall: FRL: -/240/-
Steel: 34mm dia, 3.5mm wall: FRL: -/240/-

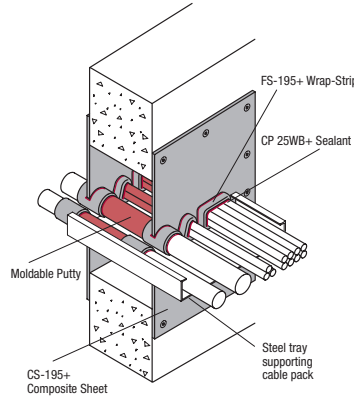
Performance Specifications for Engineers and Specifiers

3M Fire Barrier CS-195+ Composite Sheet has been tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005 under BWA Report No: 22695. The following illustrations provide a summary of the test results for D1 and D2 cable configurations, metal pipe penetrations and blank unpenetrated seals with CS-195+ installed as per the Installation Techniques. Specifications for standard D1 and D2 cable configurations can be found in AS1530.4-2005 Appendix D.

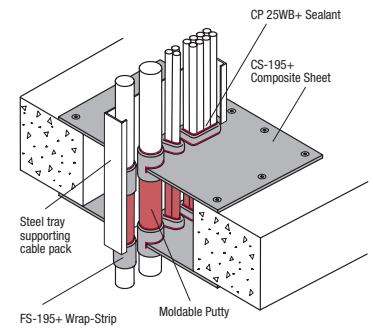
D1 Cable Pack – Power Transmission Cables.



Dry Wall 116mm – FRL: -/120/30

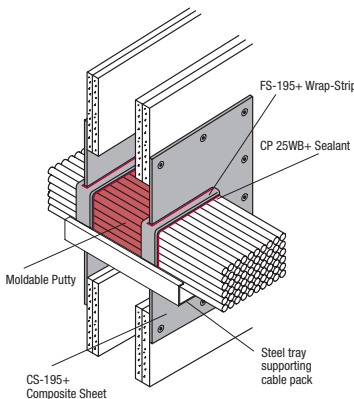


Solid Masonry, Hollow Masonry or
Concrete Wall 116mm – FRL: -/180/30

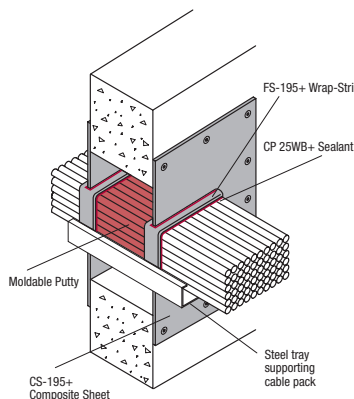


Concrete Floor 120mm – FRL: -/180/30

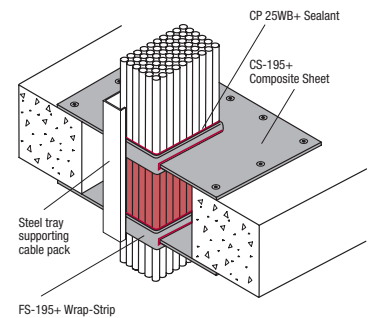
D2 Cable Pack – Telecom Cables.



Dry Wall 116mm – FRL: - /120/30

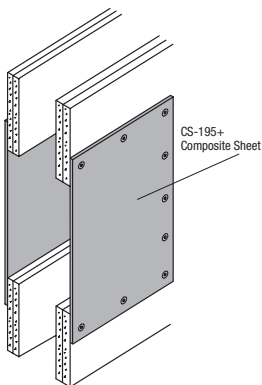


Solid Masonry, Hollow Masonry or
Concrete Wall 116mm – FRL: -/180/90

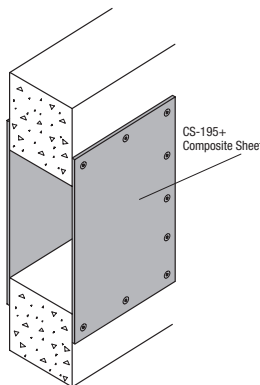


Concrete Floor 120mm – FRL: -/180/90

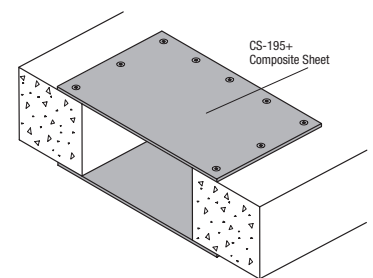
Blank Openings (unpenetrated)



Dry Wall 116mm – FRL: -/120/30



Solid Masonry, Hollow Masonry or
Concrete Wall 116mm – FRL: -/240/90



Concrete Floor 120mm – FRL: -/240/120