

SELECTION & SPECIFICATION DATA

Generic Type	A gypsum based, Spray applied Fire Resistive Material (SFRM) designed for the fire protection of interior structural steel.
Description	A 22 lbs./ft ³ density SFRM intended for the fire protection of interior structural columns, beams, joists, decks, walls, roofs, girders, floors and pre-cast concrete units. It is tested and certified for fire resistance ratings up to 4 hours.
Features	<ul style="list-style-type: none"> • Durable cementitious formulation • Noncombustible • Can be injected with Accelerator A-20 for fast set and increased yield (optional) • Asbestos-free – complies with EPA and OSHA regulations. • Mineral Wool free – no airborne fibers. • Styrene free – no toxic decomposition gases. • Economical – Maintains project on budget. • Design flexibility with over 40 UL designs.
Color	Non-Uniform Tan
Finish	Textured
Primer	Primers are not required or recommended. If a primer is specified, or steel is primed, bond strength must meet minimum UL criteria. A/D TC-55 sealer is used as a primer/bonding agent to meet this requirement where specified. Southwest Type DK3 spatter coat must be used as a primer/bonding agent on cellular decks and roof decks per UL design requirements. Contact Carboline Technical Service for further information. Pyrolite fireproofing materials neither promote nor prevent corrosion. Fireproofing should not be considered part of the corrosion protection system.
Film Build	1/2" - 5/8" (12.7 - 15.9 mm) on initial pass
Limitations	Not intended for permanent direct exposure to weather or excessive physical abuse beyond normal construction cycles. Not recommended for use as refractory cement or where operating temperatures exceed 200°F (93°C).
Topcoats	Generally not required. In severely corrosive atmospheres, consult Carboline Technical Service for selection of coating most suitable for the operating environment.

SUBSTRATES & SURFACE PREPARATION

General	Prior to application, all substrates must be clean and free of loose scale, dirt, oil, grease, condensation, or any other substance that would impair adhesion. Contact Carboline Technical Service for further information. Fireproofing shall be applied to the underside of roof deck assemblies only after all roofing work has been completed, and all roof traffic has ceased. When applying to flexible roof systems it is required that Southwest Type DK3 spattercoat is used. Also be sure that all roof work is completed and water tight before commencing installation of fire protection. Roof traffic shall be limited to maintenance after fire protection is applied and cured. No fireproofing shall be applied prior to completion of concrete work on steel floor decking.
Galvanized Steel	Prior to application, all substrates must be clean and free of loose scale, dirt, oil, grease, condensation, or any other substance that would impair adhesion. For certain designs, mechanical attachment or the application of Southwest Type DK3 (spatter coat) may be required. Contact Carboline Technical Service for further information.

SUBSTRATES & SURFACE PREPARATION

Painted/Primed Steel Decks	Apply to painted/primed steel decking only if permitted by the UL design. If the painted/primed deck is not an approved substrate, metal lath must first be secured to the deck surfaces in accordance with the UL requirements.
Painted/Primed Steel Joists	Painted steel joists do not require adhesive, lath or fastening devices. It is acceptable to apply directly to steel joists.
Painted/Primed Structural Steel	Painted/primed structural steel is generally not approved by UL as an acceptable substrate for SFRMs unless the paint or primer was included in the fire test and/or UL listed for SFRM applications to structural steel. UL has established conditions that must be satisfied for application to primed or painted structural steel, including: minimum bond strength criteria; dimensional limitations for the structural members; use of a bonding agent or adhesive such as A/D TC-55 sealer; use of metal lath to provide a mechanical bond; or, use of mechanical breaks of metal lath strips or steel pins and disks. Refer to the UL Fire Resistance Directory-Volume 1 for details or contact Carboline Technical Service before applying to any painted/primed steel beams or columns.

PERFORMANCE DATA

All test data was generated under laboratory conditions. Field testing results may vary.

Test Method	Results
ASTM C177 Insulation K Factor	0.76 BTU in/hr ft ² -°F @ 75°F
ASTM E136 Combustibility	Passed (non-combustible)
ASTM E605 Density ¹	22 pcf (352 kg/m ³) average
ASTM E736 Cohesion/Adhesion	653 psf (31 kPa)
ASTM E759 Deflection	Passed
ASTM E760 Impact	Passed
ASTM E761 Compressive Strength	6,019 psf (288 kPa)
ASTM E84 Surface Burning	Flame Spread: 10 Smoke Development: 0
ASTM E859 Air Erosion	0.00 g/ft ² (0.00 g/m ²)
ASTM E937 Corrosion	Passed
ASTM G21 Fungi Resistance	Passed (no growth)
Specific Heat	0.37 BTU/lb°F

¹ Air dry at ambient conditions to constant weight. Do not force cure. Use ASTM E605 Positive Bead Displacement method utilizing #8 lead shot. Test density in accordance with AWCI Technical Manual 12-A (Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials, an Annotated Guide).

All values derived under controlled laboratory conditions.

Test reports and additional data available upon written request.

MIXING & THINNING

Mixer	<ol style="list-style-type: none"> 1. Use a minimum 12 to 16 cubic foot heavy-duty mortar mixer capable of rotating at 40 rpm with rubber tipped blades that wipe the sides. 2. Use continuous feed mixer. Contact Carboline Technical Service for recommendation. Densities may vary when using this type of mixing equipment.
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MIXING & THINNING

Mixing	Always mix with clean potable water. The mixer shall be kept clean and free of any previously mixed materials which may cause premature setting of product. A 2 bag mix is recommended for paddle type mixers. Mix time should be approximately 2 minutes per bag at 52 rpm. Do not over mix. The material volume should not go over center bar of mixer. Use $9 \pm 1 \frac{1}{4}$ gallons (34 ± 4.7 liters) of water per 43 lb. (19.5 kg) bag. Add water to the mixer first with blades stopped. With mixer turned on, add material to the water and begin mixing.
Pot Life	2 hours at 70°F (21°C) and less at higher temperatures. Pot life ends when the material thickens and becomes unusable.
Density	For information and recommendations obtaining the proper density and yield, contact the local Carboline representative or Carboline Fireproofing Technical Service.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Pump	<p>This material can be pumped with a wide range of piston, rotor stator and squeeze pumps designed to pump cement & plaster materials including:</p> <p>Essick - model# FM9/FM5E (Rotor Stator/2L4) Putzmeister - model# S5EV(Rotor Stator/2L6) Hy-Flex - model# HZ-30E(Rotor Stator/2L6) Hy-Flex - model# H320E (Piston) Strong Mfg. - model# Spraymate 60 (Rotor Stator/2L6) Airtech - model# Swinger (Piston) Mayco - model# PF30 (Dual Piston) Thomsen - model# PTV 700 (Dual Piston)</p> <p>Marvel kit must be removed from piston pumps.</p>
Ball Valves	Ball valves should be located at the manifold and at the end of the surge hose to facilitate cleaning.
Material Hose	Use 15 to 25 feet (4.5 m to 7.6 m) of 3" (76 mm) I.D. or larger surge hose from the manifold. Follow with a 16" (406 mm) tapered fitting to a 2" (50 mm) I.D. hose to the spray area. Taper to 15 to 20 feet (4.5 m to 6 m) of minimum 1-1/4" or 1" (25 mm) whip hose.
Standpipe	Use 3" (76 mm) I.D. aluminum tubing with quick external disconnections. Elbows should be 3" (76 mm) I.D. with minimum 36" (0.9 m).
Nozzle/Gun	Use a minimum 1" (25 mm) I.D. plaster type nozzle with shut off valve, swivel and air shut off valve.
Orifice Size and Shields	9/16 to 5/8" (9.5 mm - 15.9 mm) I.D. "blow-off" tips (mini shields optional)
Compressor	Compressor on pump must be capable of maintaining minimum 30 psi (206 kPa) and 9 to 11 cfm at the nozzle.
Air Line	Use 5/8" (15.9 mm) I.D. hose with a minimum bursting pressure of 100 psi (689 kPa).

APPLICATION PROCEDURES

General | Thicknesses of 1/2" - 5/8" (12.7 mm - 15.9 mm) or less can be applied in one pass. When additional coats are required to reach specified thickness, apply subsequent coats after prior coat has set. If preceding coat has dried, dampen the surface with water prior to application of additional coats. Material can be injected with Accelerator A-20 solution to increase set time and yield. Type DK3 (Spatter Coat) shall be applied to all cellular floor units and to all roof deck systems where indicated by the UL design. Contact Carboline Fireproofing Technical Service for further information.

Field Tests | Test for thickness and density in accordance with the applicable building code, AWCI Technical Manual 12-A (Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials, an Annotated Guide), and ASTM E605 (Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members).

Finishing | Normally left as a sprayed texture finish.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	40°F (4°C)	40°F (4°C)	40°F (4°C)	0%
Maximum	100°F (38°C)	125°F (52°C)	110°F (43°C)	95%

Air and substrate temperatures shall be maintained 24 hours before, during and 24 hours after application. Gypsum based products are susceptible to water and must be protected accordingly. Contact Carboline Fireproofing Technical Service for recommendations.

CURING SCHEDULE

Surface Temp.	Dry to Recoat
77°F (25°C)	4 Hours

Recoat times will vary based upon ambient conditions and air movement. Material can be injected with Accelerator A-20 for fast set time and increased yield.

CLEANUP & SAFETY

Cleanup | Pump, mixer and hoses should be cleaned with potable water. Sponges should be run through the hoses to remove any material remaining in the hoses. Wet overspray must be cleaned up with clean, potable water. Cured overspray material may be difficult to remove and may require chipping or scraping to remove.

Safety | Follow all safety precautions on the Material Safety Data Sheet. It is recommended that personal protective equipment be worn, including spray suits, gloves, eye protection and respirators.

Overspray | Adjacent surfaces shall be protected from damage and overspray. Sprayed fireproofing materials may be difficult to remove from surfaces and may cause damage to architectural finishes.

Ventilation | In enclosed areas, ventilation shall not be less than 4 complete air exchanges per hour until the material is dry.

TESTING / CERTIFICATION / LISTING

Underwriters Laboratories, Inc.	<p>Tested in accordance with ASTM E119/UL 263 at Underwriter's Laboratories, Inc. and listed by UL in the following designs:</p> <p>Columns: Y707, Y708</p> <p>Roof Assembly: P734, P735, P736, P737, P738, P739, P926, P927, P928, P929</p> <p>Roof Beams: S731, S732, S733</p> <p>Beams: N771, N772, N773, N774, N775</p> <p>Floor/Ceiling Assembly (Restrained/Unrestrained): D767, D768, D769, D770, D771, D772, D773, D774, D775, D776, D777, D927, D928</p> <p>Walls: U704</p> <p>Pre-cast Concrete & Steel Joists: G706, G707, G708, J713, J714, J715, J716</p>
City of New York	<p>MEA No. 268-98-M (Floor/Ceiling)) MEA No. 269-98-M (Floor/Ceiling) MEA No. 270-98-M (Floor/Ceiling) MEA No. 271-98-M (Floor/Ceiling) MEA No. 272-98-M (Beams) MEA No. 273-98-M (Roof/Ceiling) MEA No. 274-98-M (Roof/Ceiling) MEA No. 275-98-M (Beam for Roof Ceiling) MEA No. 276-98-M (Wall) MEA No. 277-98-M (Column)</p>

PACKAGING, HANDLING & STORAGE

Packaging	43 lb. (19.5 kg) bags
Shelf Life	12 months
Storage	<p>Store indoors in a dry environment between 32°F - 125°F (0°C - 52°C)</p> <p>Material must be kept dry or clumping of material may occur.</p>
Shipping Weight (Approximate)	43 lb. (19.5 kg)

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.