Substrates & Surface Preparation

General

For complete application instructions refer to the Southwest Fireproofing Products Field Application Manual.

Before application of Type 7HD™, all substrates must be clean and free of loose scale, dirt, oil, grease, or any other substance that would impair adhesion.

Note: For certain designs, mechanical attachment may be required prior to the Type 7HD™. Consult the relevant UL Design for details or contact Carboline Technical Service for further information.

Caution: Attachment of metal lath is required prior to application of 7HD™ to all deck surfaces because of the increased weight as compared to normal and medium density products.

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.

No fireproofing shall be applied prior to completion of concrete work on steel floor decking.

Primers

Primers are not recommended or required, except as described below. If a primer is required, contact Carboline Technical Service for recommendations.

Steel Decks

Metal lath must first be secured to all decks prior to application of 7HD™. Type 7HD™ may be applied to painted/primed steel decking only if permitted by the UL design.

Painted/Primed Structural Steel

Painted/primed structural steel is generally not approved by UL as an acceptable substrate for sprayed fire resistive materials unless the paint or primer was included in the fire test and/or is a UL listed Primer for 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; use of metal lath to provide a mechanical bond; or, use of mechanical breaks of strips of metal lath or steel pins and disks. Refer to the UL Fire Resistance Directory - Volume 1 for details or contact Carboline Technical Service before applying Type 7HD™ to any painted / primed structural steel.

Painted/Primed Steel Joists

Painted steel joists do not require adhesive, lath or fastening devices. It is acceptable to apply 7HD™ directly to steel joists.

Application Equipment

The following are general equipment guidelines for the application of this product. Job site conditions may necessitate modifications to these guidelines to achieve desired results.

Mixer

1. Use a minimum 12 to 16 ft^3 heavy-duty mortar mixer rotating at 32 rpm. Use 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.

Pumps

Type 7HD™ can be pumped with a wide range of piston, rotor/stator and squeeze pumps designed to pump cement/plaster materials, including:

Mfg.	Model	Type	Size
Essick	FM9/FM5E	Rotor Stator	2L4
Putzmeister	S5EV	Rotor Stator	2L6
Hy-Flex	HZ-30E	Rotor Stator	2L6
Sunspray	EZ88	Rotor Stator	2L6
Strong Mgf.	Spraymate 60	Rotor Stator	2L6
Airtech	Swinger	Piston	N/A
Hy-Flex	H320E	Piston	N/A
Mayco	PF30	Dual Piston	N/A
Thomsen	PTV 700	Dual Piston	N/A
Note: Marvel kit must be removed from piston pumps.			

Compressor

Compressor on pump must be capable of maintaining minimum 30 psi 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 (6.9 kPa).

Ball Valves

Ball valves should be located at the manifold and at the end of the surge hose to facilitate cleaning of the pump and/or hoses.

Hoses

Use 15 to 25 ft of 3" I.D. surge hose from the manifold. Follow with a 16" tapered fitting to a 2" I.D. hose to the spray area. Follow with a tapered fitting to a 1-1/2" hose approx. 25 ft long, then another tapered fitting to 15 to 20 ft of 1-1/4". This can be used as the whip line. If a 1" whip line is desired, add a tapered reducer and no more than 10 to 15 ft of 1" whip hose.

Standpipe

Use 3" I.D. aluminum tubing with quick external disconnections. Elbows should be 3" I.D. with minimum 36".

Nozzle/Gun

Use a minimum 1" I.D. plaster type nozzle with shut off valve, swivel and air shut off valve.

Orifice Tips and Shields

3/8" to 1/2" I.D. "blow-off" tips with "mini shields".

Mixing

Type 7HD™ fireproofing material shall be mixed in a conventional plaster paddle type or continuous mixer designed specifically for cementitious fireproofing. 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 1-1/2 minutes at 32 RPM. Do not over mix.

Southwest Fireproofing Type 7HD™

Use 8 gallons of water per 50 lb bag of Type 7HD™. Add water to the mixer first. With blades stopped add Type 7HD™ to the water.

Density

Wet density measurements at the nozzle are helpful to estimate yield as work progresses so that adjustments to the spraying operation can be made in time to affect job yield and cost. To check wet density, fill a container of known volume, such as a 5 oz Dixie cup, with sprayed material level with the top rim of the cup. Take care to avoid trapping air bubbles or compaction of the material in the cup. Determine the weight of the material in the cup in g. Multiply the weight (in grams) by a conversion factor based on the size of the container (conversion factor is 2.107 divided by the volume of the container in oz) to yield wet density in lbs/ft^3 (pcf).

Cup Used	Conversion Factor	Cup Used	Conversion Factor
3 oz	.702	8 oz	.263
4 oz	.527	12 oz	.175
5 oz	.421	16 oz	.132
6 oz	.351	33.8 oz (1 liter)	.062

Theoretical gross yield may be calculated as follows:

Yield = 12 x (G x 8.34 + W) / D

Where, G = gallons of water per bag, gals

W = weight of material in bag, lb

D = nozzle wet density, pcf

Type 7HD™ Theoretical Yield* Chart					
Water Used per bag (gal)	Nozzle Wet Density (D)			*Estimated Coverage (board ft per bag)	Target Dry Density, pcf
	g / Liter	Weight in 5 oz cup, g (net)	pcf		
8	1032-1355	153-180	64-84	**16.6**	**40**
* Theoretical Gross. Field results will vary. Material losses during mixing and application will vary and must be taken into consideration when estimating job requirements.					

Application Procedures

For complete application instructions refer to the Southwest Fireproofing Products Field Application Manual.

Thicknesses of 5/8 inch or less can typically be applied in one pass. If preceding coat has dried, dampen the surface with water prior to application of additional coats.

Use only potable water (drinking quality).

Apply product to achieve a uniform texture and thickness as required by UL design.

Refer to complete Application Guide for further details.

Application Conditions

Air and substrate temperatures shall be 40°F minimum, and shall be maintained during and for a minimum of 24 hours before and after spraying occurs.

Ventilation in enclosed areas is very important to assist product to set and dry properly. Total air exchange should be at least 4 times per hour.

Finishing

Finish appearance will be determined based on size of orifice and the amount of air pressure used. Type 7HD™ is normally left as a sprayed texture finish.

Protection of Adjacent Surfaces

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.

Curing

Fresh Type 7HD™ must be protected from rain and running water for 24 hours.

Air and substrate temperatures shall be 40°F minimum, and shall be maintained during and for a minimum of 24 hours before and after spraying occurs.

Field Tests

The architect may select and the owner pay for independent testing of spray applied fire resistive materials. Testing shall be 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.

Density samples must be air dried at ambient conditions to constant weight. Do not force cure. Use ASTM E605 bead (#8 lead shot) displacement method.

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 Type 7HD™ overspray must be cleaned up with soapy or clean, potable water. Cured overspray material may be difficult to remove and may require chipping or scraping to remove.

Safety Read and abide by the MSDS.

Do not breathe dust. Use OSHA approved dust mask.

Safety goggles or glasses should be worn. For eye contact, flush with copious amount of water in accordance with OSHA instructions.

Wash skin with clean water to prevent irritation.

Follow equipment manufacturers' recommendations regarding safety and maintenance.

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