

# GRACE

## Construction Products

### 1. Product Name

Monokote® MK-6®/HY® and MK-6®s Structural Steel Fireproofing

### 2. Manufacturer

Grace Construction Products  
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### 3. Product Description

#### BASIC USE

Monokote® MK-6®/HY® and MK-6®s are single component, spray applied, mill-mixed fireproofing plasters. MK-6/HY and MK-6s are used on structural steel columns, beams, concrete and fluted decking to provide up to 4 hours of fire protection. With the application of Spatterkote® SK-3, ratings of up to 3 hours can be obtained on cellular flat-plate decking.

Monokote MK-6/HY and MK-6s afford the same level of fire protection at identical protection thicknesses. Specifying Monokote MK-6 allows the subcontractor to select the product that provides the most efficient fire protection for the specific project conditions.

#### COMPOSITION & MATERIALS

Monokote MK-6/HY and MK-6s are cementitious factory-mixed products. Only the addition of water is required on the jobsite to form a cohesive, pumpable slurry.

#### LIMITATIONS

Monokote MK-6/HY and MK-6s should not be used in areas directly exposed to weather. Monokote Z-106 and Z-146 are recommended for exposed applications, high traffic areas subject to excessive physical abuse, and industrial spray applied fireproofing applications. With proper substrate preparation, Monokote Z-146 is approved for exterior use.

### 4. Technical Data

#### APPLICABLE STANDARDS

ASTM International

- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E736 Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
- ASTM E759 Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members
- ASTM E760 Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members
- ASTM E761 Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members
- ASTM E859 Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members
- ASTM E937 Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRMs) Applied to Structural Members
- ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

Tests developed by the City of San Francisco, Bureau of Building Inspection (SF)

- Abrasion Resistance Test Method
- Impact Penetration Test Method

U.S. Department of Veterans Affairs (VA) - VA H08-1

U.S. Environmental Protection Agency (EPA) - EPA Regulation 40 CFR, Part 61, Sub-part M, Section 61.148

#### APPROVALS

- International Building Code (IBC)
- Building Officials and Code Administrators International Inc. (BOCA)
- International Conference of Building Officials (ICBO)
- Uniform Building Code (UBC)
- Southern Building Code Congress International, Inc. (SBCCI)

#### PHYSICAL/CHEMICAL PROPERTIES

Monokote MK-6s and MK-6/HY Structural Steel Fireproofing exhibit the properties indicated in Table 1.

#### FIRE RATING

Underwriters Laboratories, Inc. (UL), fire ratings are provided in Table 2.

### 5. Installation

#### PREPARATORY WORK

Steel must be free of oil, grease, loose mill scale, paint or any other substance that can impair proper adhesion. Where possible, all clips, hangers, supports, sleeves and other attachments should be in place prior to the application of the fireproofing.

TABLE 1 PHYSICAL PROPERTIES OF MONOKOTE MK-6

Property & test	Recommended specifications	Laboratory test values
Bond strength (average), ASTM E736	> 200 psf (10 kPa)	339 psf (16 kPa)
Compressive strength, ASTM E761	> 1200 psf (57 kPa)	1440 psf (69 kPa)
Air erosion, ASTM E859	0.09 g/ft <sup>2</sup> (0.0 g/m <sup>2</sup> )	0.00 g/ft <sup>2</sup> (0.0 g/m <sup>2</sup> )
Bond impact, ASTM E760	Does not crack, spall or delaminate	Pass
Deflection, ASTM E759	Does not crack, spall or delaminate	Pass
Surface burning, ASTM E84	Flamespread 0 Smoke developed 0	Flamespread 0 Smoke developed 0
Corrosion, ASTM E937	Does not promote corrosion	Does not promote corrosion
Fungi resistance, ASTM G21	No mold growth	Pass (no growth)
Impact penetration, City of San Francisco test	< 6 cm <sup>3</sup>	< 3.3 cm <sup>3</sup>
Abrasion resistance, City of San Francisco test	< 15 cm <sup>3</sup>	< 8.3 cm <sup>3</sup>

## APPLICATION METHODS

Multiple passes may be required to build the material up to the thickness required to achieve the fire resistance rating.

Field inspection for thickness, density and bond strength by an independent agency is recommended and may be required by the local building code jurisdiction. Any areas with insufficient thickness or damage by subsequent trades must be patched to the appropriate thickness to maintain the indicated fire resistance rating.

## 6. Availability & Cost

### AVAILABILITY

Sales representatives and manufacturing facilities are located throughout North America, Latin America, Europe and Asia.

### COST

Contact a Grace sales representative for cost information.

## 7. Warranty

Contact a Grace representative for warranty details.

## 8. Maintenance

No maintenance is required. Contact a qualified Monokote contractor to patch areas of fireproofing material disturbed by later activity.

## 9. Technical Services

Grace sales representatives are trained to provide specification and jobsite assistance. Contact Grace for the nearest office.

## 10. Filing Systems

- Reed First Source
- AIA MASTERSPEC® Section 07811 - Sprayed Fire-Resistive Material
- General Services Administration (GSA) - AIA/SC/GSA Specification Section 07811
- NAVFACENGCOM Guide Specification NFGS-07810B Spray Applied Fireproofing
- Additional product information is available from the manufacturer.

W.R. Grace & Co.-Conn. hopes the information here will be helpful. It is based upon data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W.R. Grace & Co.-Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, W.R. Grace & Co. Canada, Ltd., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

TABLE 2. UL FIRE RESISTANCE DIRECTORY DESIGNS UTILIZING GRACE MONOKOTE <sup>1</sup>

Construction	Restrained assembly rating (hr)					UL Design No.	Unrestrained assembly rating (hr)				
	1	1 1/2	2	3	4		1	1 1/2	2	3	4
<b>Protected floor/ceiling systems</b>											
Electrified floor options	■	■	■	■	■	D739	■	■	■	■	■
Fluted deck only	■	■	■	■	■	D779	■	■	■	■	■
Unclassified painted deck	■	■	■			D744	■	■	■		
Form deck	■	■	■	■		D780	■	■	■	■	
Fluted deck, 3 1/4" (83 mm) lightweight concrete	■	■	■	■	■	D782	■	■	■	■	■
<b>Unprotected floor/ceiling systems</b>											
Fluted and cellular deck	■	■	■	■		D925 <sup>5</sup>	■	■	■	■	
Epicore deck/Versa-deck		■	■	■		D917					
<b>Concrete systems</b>											
Pan-joist/Poured-in-place				■		J701	■				
Slab/Poured-in-place	■	■	■	■	■	J709, J712	■	■	■	■	■
Precast tees				■	■	J704, J705			■	■	■
Precast - Hollow core				■	■	J919			■	■	■
<b>Roof/ceiling systems</b>											
IRMA roof	■	■	■			P714	■	■	■		
Polystyrene foam insulation	■	■	■	■		P732	■	■	■	■	
Polyisocyanurate foam insulation	■	■	■	■		P732	■	■	■	■	
Spray polyurethane foam insulation	■	■	■	■		P733	■	■	■	■	
Mineral and fiberboard roof insulation	■	■	■	■		P732	■	■	■	■	
Lightweight insulating concrete roof deck	■	■	■			P936 <sup>5</sup>	■	■	■		
<b>Beams/Joists <sup>2</sup></b>											
Beams only - Floor systems, protected	■	■	■	■	■	N706, N779	■	■	■	■	■
Beams only - Floor systems, unprotected	■	■	■	■	■	N708, N782	■	■	■	■	■
Joist only - Floor systems	■	■	■	■	■	N736	■	■	■	■	■
	■	■	■	■		N777	■	■	■	■	
Beam only - Roof systems, unprotected	■	■	■	■	■	S735	■	■	■	■	■
Beam only - Roof systems, protected	■	■	■	■	■	S734	■	■	■	■	■
Joist only - Roof systems, protected	■	■	■	■	■	S728	■	■	■	■	■
Joist only - Roof systems, unprotected	■	■	■	■	■	S736	■	■	■	■	■
<b>Columns <sup>3</sup></b>											
W6 x 9 to W14 x 730 (SI: W150 x 13 to W360 x 1086) W shape steel column <sup>4</sup> formula	■	■	■	■	■	X772, Y715	■	■	■	■	■
Tube and pipe columns	■	■	■	■	■	X771, Y710	■	■	■	■	■
Concrete-filled columns	■	■	■	■	■	X791	■	■	■	■	■

<sup>1</sup> Refer to the UL design listing for concrete type, beam sizes, composite beam, deck profile, trench header and electrical inserts for covering type and other construction details.

<sup>2</sup> Ratings for N or S series designs refer to restrained or unrestrained beam ratings.

<sup>3</sup> Column ratings do not fall under restrained or unrestrained beam ratings.

<sup>4</sup> Column W/D must be between 0.33 and 6.62.

<sup>5</sup> Unrestrained ratings are subject to deck gauge and span limitations.

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MGH/LI/3M

