



Fireproofing Products 2008

**CERTIFIED
APPLICATOR**
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Monokote® MK-6®

Standard Density Fireproofing



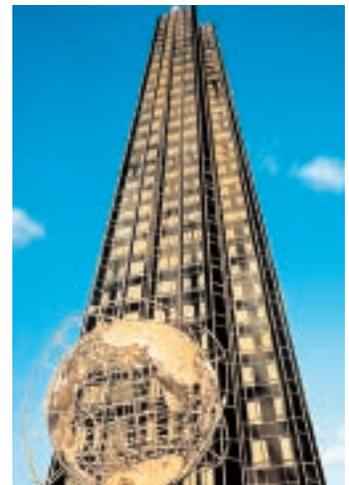
Petronis Twin Towers, Kuala Lumpur, Malaysia



Lille Airport Terminal, Lille, France



New York-New York Hotel and Casino, Las Vegas, Nevada



Trump International Hotel & Tower, New York, New York

Monokote® MK-6®/HY® and MK-6®s

Proven, in-place performance on interior structural steel makes these products the most widely used fireproofing in the world. MK-6®/HY® and MK-6®s are cost-effective, gypsum-based, cementitious spray applied fireproofing products designed for easy, fast application to steel and concrete substrates. Both products provide maximum flexibility for a wide variety of jobsite conditions.

Typical Uses

Interior, concealed applications such as:

- High rise and low rise commercial office buildings
- Government buildings
- Hotels, resorts and casinos
- Health care facilities
- Schools and museums

Benefits

- High bond strength in excess of 200 psf
- Resists damage from air erosion and abrasion
- Gypsum-based formulation contains no mineral fibers
- No topcoat or surface sealer required

Retro-Guard® Replacement Fireproofing

Retro-Guard® is a cementitious replacement fireproofing designed for retrofit spray application to steel and concrete substrates. Its blue signal coat makes it easy to identify re-sprayed areas. Interior, concealed applications include retrofit of commercial office buildings, asbestos abatement and patching and repair of existing fireproofing.

Monokote® MK-6®/HY® Extended Set™ Fireproofing

Monokote® MK-6®/HY® Extended Set™ fireproofing increases applicator productivity and minimizes the impact of fireproofing on the construction schedule. This single component, mill-mixed, cementitious fireproofing plaster has a delayed set feature which allows it to be left unattended in the delivery system for up to 4 days. At the jobsite, water is added to form a consistent, pumpable slurry and Monokote® Accelerator is injected to achieve fast set, high production results. MK-6/HY Extended Set is approved for use on structural steel columns, beams, joists, trusses and floors and on roof decking. It is listed in the UL Fire Resistance Directory.

Feature	Benefit
Delayed set time (>96 hrs)	<ul style="list-style-type: none"> • Allows applicator to significantly reduce or eliminate time consuming pump-in/pump-out procedure • Allows applicator to increase daily productivity rate (bags/day) up to 20% • Allows applicator to reduce waste water disposal and material scrap • Allows applicator to complete fireproofing jobs in less time
Same in-place performance and fire rating performance as MK-6/HY	<ul style="list-style-type: none"> • Durable • UL listed (MK-6/HY) • Factory inspected to ensure product performance • Compliance with UBC, NBC, SBC and IBC Building Codes
Superior technical service and support	<ul style="list-style-type: none"> • Provides application training and support • Provides timely trouble shooting and follow up service

Physical Properties and Recommended Specifications

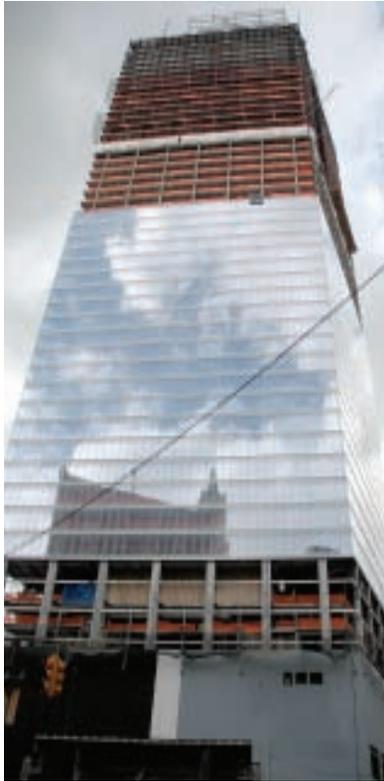
Monokote MK-6 and Retro-Guard RG			
Physical Properties	Recommended Specifications*	Tested Values	Test Method
Dry Density, Minimum Average	240 kg/m ³ (15 pcf)	240 kg/m ³ (15 pcf)	ASTM E 605/ UBC STD 7-6
Bond Strength	9.6 KPa (200 psf)	16.2 KPa (339 psf)	ASTM E 736
Compression, 10% Deformation	57 KPa (1,200 psf)	68.9 KPa (1,440 psf)	ASTM E 761
Air Erosion	Max. 0.05 g/m ² (0.005 g/ft ²)	0.000 g/m ² (0.000 g/ft ²)	ASTM E 859
High Velocity Air Erosion	No continued air erosion after 4 hours	No continued erosion after 4 hours	ASTM E 859
Corrosion	Does not contribute to corrosion	Does not contribute to corrosion	ASTM E 937
Bond Impact	No cracking, spalling or delamination	No cracking, spalling or delamination	ASTM E 760
Deflection	No cracking, spalling or delamination	No cracking, spalling or delamination	ASTM E 759
Resistance to Mold Growth	No growth after 28 days	No growth after 28 days	ASTM G 21
Impact Penetration City	No more than 6 cm ³ abraded	3.3 cm ³	Developed by the City of San Francisco
Abrasion Resistance City	No more than 15 cm ³ abraded	8.3 cm ³	Developed by the City of San Francisco

* Monokote MK-6/HY, MK-6/HY Extended Set and MK-6s meet or exceed these performance standards.

Monokote® Z-106

Medium Density Fireproofing

7 World Trade Center
New York, NY



Foxwoods Resort & Casino,
Ledyard, Connecticut



Old Trafford Stadium,
Manchester, United Kingdom

Monokote® Z-146 & Z-156

High Density Fireproofing



Malden Mills Industries, Lawrence, Massachusetts



New York City Hospital,
New York, New York



White Oak Semiconductor, Richmond, Virginia

MEDIUM AND HIGH DENSITY FIREPROOFING PRODUCTS

Monokote® Z-106 & Z-106/HY

Medium density, cement-based fire protection products provide superior durability for interior, exposed applications. Z-106 was the first generation of Monokote medium density fireproofing products. Monokote® Z-106/HY is the next generation: 100% portland cement binder, medium density fireproofing. In addition to the moisture resistance and durability of Z-106, Z-106/HY incorporates application benefits including Grace's patented injection technology for fast set and improved hangability. Specifying both Z-106 and Z-106/HY allows alternatives for providing highly cost effective installation while assuring the specifier of high performance in-place characteristics.

Typical Uses

Interior, exposed applications such as:

- High rise commercial office buildings
- Transportation terminals
- Convention centers
- Parking garages
- Light manufacturing facilities
- Elevator shafts
- Swimming pool areas

Benefits

- Cement-based formulation provides high bond strength — >1,000 psf
- Damage-resistant surface resists air erosion, abrasion and impact damage
- Can be trowel finished for improved aesthetics
- Withstands traffic, high humidity and condensation

Recommended Specifications for High and Medium Density Products*

	Z-156**	Z-146**	Z-106 & Z-106/HY	Test Method
Minimum Dry Density	800 kg/m ³ (50 pcf)	640 kg/m ³ (40 pcf)	350 kg/m ³ (22 pcf)	ASTM E 605
Minimum Bond Strength	472 kN/m ² (10,000 psf)	472 kN/m ² (10,000 psf)	94.5 kN/m ² (2,000 psf)	ASTM E 736
Minimum Compressive Strength @ 10% Deformation	5.86 MPa (850 psi)	3.79 MPa (550 psi)	476 KPa (70 psi)	ASTM E 761
Deflection & Bond Impact	No Cracking or Delamination	No Cracking or Delamination	No Cracking or Delamination	ASTM E 759
Air Erosion	0.000gr/m ² (0.000g/ft ²)	0.000gr/m ² (0.000g/ft ²)	0.000gr/m ² (0.000g/ft ²)	ASTM E 859
Resistance to Mold Growth	Yes	Yes	Yes	ASTM G 21
Standard Color	Gray	Gray	Gray	

* Actual laboratory tested values meet or exceed Grace's recommended value. Test reports are available on request from your Grace sales representative.

** ASTM test methods modified where required, for high density, high performance products.

Monokote® Z-146, Z-156, Z-146T & Z-156T

High density, cement-based fire protection delivers maximum protection for interior or exterior exposed applications.

Typical Uses

Interior or exterior exposed applications such as:

- High-tech clean rooms
- Chip fabrication facilities
- Transportation terminals
- Heavy manufacturing facilities
- Gymnasiums and sports facilities
- Elevator shafts and stairwells
- Mechanical rooms

Benefits

- Cement-based formulation provides extremely high bond strength — >10,000 psf
- Tough, concrete-like surface resists air erosion and abrasion
- Can be trowel finished for improved aesthetics
- Releases no particulate matter or volatile organics to interfere with sensitive computer chip manufacturing environments
- Suitable for exterior exposure — resists freeze/thaw, wind and rain
- T-Series recommended where corrosion resistance is required

CC-CODES, CERTIFICATION

Performance

Monokote meets or exceeds the in-place performance requirements and complies with the following specifications.

- General Services Administration (GSA); AIA/SC/GSA: 07811
- Department of the Navy; NAVFACENGCOM Guide Specification NFGS-07810B, Sprayed Applied Fireproofing
- Veterans Administration (VA); H-08-1
- U.S. Environmental Protection Agency (EPA); Regulation 40 CFR, Part 61, Sub-part M, Section 61:148
- Department of the Army U.S. Army Corps of Engineers Guide Specification For Military Construction Section 07810 Spray Applied Fireproofing CEGS-07810 (May 1998)

Fire Test Performance

Monokote fireproofing is included in over 120 design listings at Underwriters Laboratories Inc. (UL).

It has been tested worldwide and has the following global approvals.



- USA UL 263/ASTM E 119
- Japan JIS A 1304
- Spain PNE 23.820
- England BS 476 Part 8
- Canada ULC S101/ASTM E 119
- France ISO 834
- Germany DIN 4102
- Korea KSF-2257
- Belgium ISO 834

Building Codes

Monokote fireproofing products meet the requirements of the following building code bodies:

- International Building Code
- Southern Building Code Congress International
- Building Officials and Code Administrators, International
- International Conference of Building Officials
- New York City MEA
- National Building Code of Canada



In areas where local codes dictate, contact your Grace representative for assistance.

Underwriters Laboratories Inc. Fire Ratings

The following chart details the most common UL designs utilizing Monokote MK-6 fireproofing. For specific design selection assistance, contact your Grace sales representative.

Construction ¹	Restrained Assembly Rating (Hr.)					UL Design No.
	1	1 1/2	2	3	4	
Protected Floor/Ceiling Systems						
Fluted Deck	•	•	•	•	•	D779, D743
Electrified Floor Options	•	•	•	•	•	D739, D743
Unclassified Painted Decking	•	•	•			D744
Form Deck	•	•	•	•		D780
Fluted Deck/3-1/4" LW Concrete	•	•	•	•	•	D782
Unprotected Floor/Ceiling Systems						
	•	•	•	•		D925 ⁵
Concrete Systems						
Pan-Joist/Poured-In-Place			•			J701
Slab/Poured-In-Place	•	•	•	•	•	J709, J712
Precast/Tees			•	•	•	J704, J705
Precast/Hollow Core			•	•	•	J706, J919
Roof/Ceiling Systems						
IRMA Roof	•	•	•			P714
Polystyrene Foam Insulation	•	•	•	•		P732
Polyisocyanurate Foam Insulation	•	•	•	•		P732
Spray Polyurethane Foam Insulation	•	•	•	•		P733
Mineral Fiber Board/Fiberglass Roof Insulation	•	•	•	•		P732
Lightweight Insulating Concrete Roof Deck	•	•	•			P936 ⁵
Beams/Joists²						
Beam Only — Floor Systems	•	•	•	•	•	N706, N779
	•	•	•	•	•	N708, N782
Joist Only — Floor Systems	•	•	•	•	•	N736
	•	•	•	•		N777
Beam Only — Roof Systems	•	•	•	•	•	S735
	•	•	•	•	•	S734
Joist Only — Roof Systems	•	•	•	•		S728
	•	•	•	•		S736
Columns³						
(Size)						(Metric Equivalent)
W6 x 9	To					(W150 x 13)
W14 x 730						(W360 x 1086)
W-shaped Steel Column ⁴ Formula	•	•	•	•	•	Y724, Y715, X795
Tube and Pipe Columns	•	•	•	•	•	Y710, X795
Concrete Filled Pipe Column	•	•	•	•	•	X791

¹ Refer to the UL Design Listing for concrete type, beam sizes, composite beam, deck profile, trench header, electrical inserts, roof covering type and other construction details.

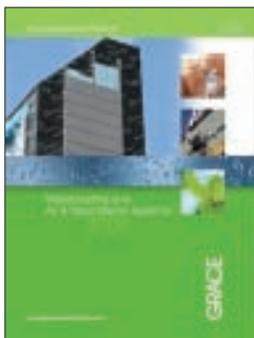
² Ratings for N or S series designs refer to restrained or unrestrained beam ratings only.

³ Column ratings do not fall under restrained or unrestrained rating criteria.

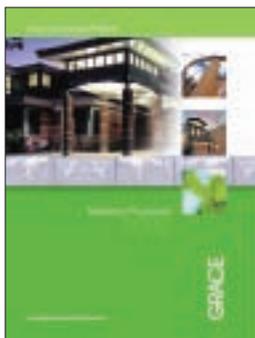
⁴ Column W/D must be between 0.33 and 6.62.

⁵ Unrestrained ratings are subject to deck gauge and span limitations.

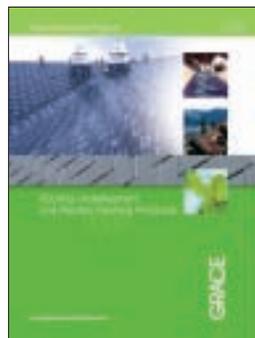
Grace offers a complete line of building products to help protect your most important structures. Remember to cross reference our other catalogs.



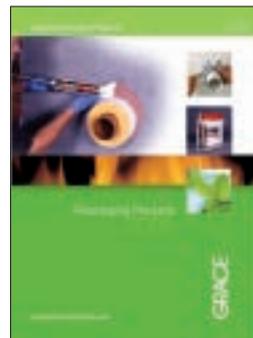
Waterproofing Products
Section Number 07 10 00



Masonry Products
Section Number 04 22 00



Underlayment Products
Section Number 07 50 00



Firestop Products & Systems
Section Number 07 84 00

KEY FIRE PROTECTION PRODUCTS SALES LOCATIONS

WORLDWIDE HEADQUARTERS

NORTH AMERICA

W.R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140-1692
USA

866-333-3SBM (3726)
Fax 888-531-5192

Service Centers

Grace maintains sales offices in every major metropolitan area. To contact your local Grace fire protection representative, or to obtain additional product information call:

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Fax 54-1-229-0193

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Fax 852-2-675-9193

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W.R. Grace Australia Ltd.
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web Visit our web site at www.graceconstruction.com

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