Monokote® MK-6®

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.
OUR NEWEST PRODUCT INNOVATION

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

Monokote® MK-6/HY® Extended Set™ fireproofing is the newest innovation in MK-6/HY technology. It 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.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
</table>
| Delayed set time (>96 hrs) | • 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 | • 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 | • Provides application training and support  
• Provides timely trouble shooting and follow up service |

Physical Properties and Recommended Specifications

<table>
<thead>
<tr>
<th>Physical Properties</th>
<th>Recommended Specifications*</th>
<th>Tested Values</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density, Minimum Average</td>
<td>240 kg/m³ (15 pcf)</td>
<td>240 kg/m³ (15 pcf)</td>
<td>ASTM E 605/UBC STD 7-6</td>
</tr>
<tr>
<td>Bond Strength</td>
<td>9.6 kPa (200 psf)</td>
<td>16.2 kPa (339 psf)</td>
<td>ASTM E 736</td>
</tr>
<tr>
<td>Compression, 10% Deformation</td>
<td>57 kPa (1,200 psi)</td>
<td>68.9 kPa (1,440 psi)</td>
<td>ASTM E 761</td>
</tr>
<tr>
<td>Air Erosion</td>
<td>Max. 0.05 g/m² (0.005 g/ft²)</td>
<td>0.000 g/m² (0.000 g/ft²)</td>
<td>ASTM E 859</td>
</tr>
<tr>
<td>High Velocity Air Erosion</td>
<td>No continued air erosion after 4 hours</td>
<td>No continued erosion after 4 hours</td>
<td>ASTM E 859</td>
</tr>
<tr>
<td>Corrosion</td>
<td>Does not contribute to corrosion</td>
<td>Does not contribute to corrosion</td>
<td>ASTM E 937</td>
</tr>
<tr>
<td>Bond Impact</td>
<td>No cracking, spalling or delamination</td>
<td>No cracking, spalling or delamination</td>
<td>ASTM E 760</td>
</tr>
<tr>
<td>Deflection</td>
<td>No cracking, spalling or delamination</td>
<td>No cracking, spalling or delamination</td>
<td>ASTM E 759</td>
</tr>
<tr>
<td>Resistance to Mold Growth</td>
<td>No growth after 28 days</td>
<td>No growth after 28 days</td>
<td>ASTM G 21</td>
</tr>
<tr>
<td>Impact Penetration City</td>
<td>No more than 6 cm³ abraded</td>
<td>3.3 cm³</td>
<td>Developed by the City of San Francisco</td>
</tr>
<tr>
<td>Abrasion Resistance City</td>
<td>No more than 15 cm³ abraded</td>
<td>8.3 cm³</td>
<td>Developed by the City of San Francisco</td>
</tr>
</tbody>
</table>

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

Visit our web site at www.graceconstruction.com
Monokote® Z-106

Medium Density Fireproofing

Monokote® Z-146

High Density Fireproofing

One Beacon Street, Boston, Massachusetts

Foxwoods Resort & Casino, Ledyard, Connecticut

Old Trafford Stadium, Manchester, United Kingdom

New York City Hospital, New York, New York

Malden Mills Industries, Lawrence, Massachusetts

White Oak Semiconductor, Richmond, Virginia

www.graceconstruction.com
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*

<table>
<thead>
<tr>
<th></th>
<th>Z-146**</th>
<th>Z-106 and Z-106/HY</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Density</td>
<td>640 kg/m³ (40 pcf)</td>
<td>350 kg/m³ (22 pcf)</td>
<td>ASTM E 605</td>
</tr>
<tr>
<td>Minimum Bond Strength</td>
<td>472 kN/m² (10,000 psf)</td>
<td>94.5 kN/m² (2,000 psf)</td>
<td>ASTM E 736</td>
</tr>
<tr>
<td>Minimum Compressive Strength @ 10% Deformation</td>
<td>3.79 MPa (550 psi)</td>
<td>476 KPa (70 psi)</td>
<td>ASTM E 761</td>
</tr>
<tr>
<td>Deflection &amp; Bond Impact</td>
<td>No Cracking or Delamination</td>
<td>No Cracking or Delamination</td>
<td>ASTM E 759</td>
</tr>
<tr>
<td>Air Erosion</td>
<td>0.000gr/m² (0.000g/ft²)</td>
<td>0.000gr/m² (0.000g/ft²)</td>
<td>ASTM E 859</td>
</tr>
<tr>
<td>Resistance to Mold Growth</td>
<td>Yes</td>
<td>Yes</td>
<td>ASTM G 21</td>
</tr>
<tr>
<td>Standard Color</td>
<td>Gray</td>
<td>Gray</td>
<td></td>
</tr>
</tbody>
</table>

* 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
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
- Trowel grade Z-146 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
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

<table>
<thead>
<tr>
<th>Protected Floor/Ceiling Systems</th>
<th>1</th>
<th>1 1/2</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluted Deck</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>D779</td>
</tr>
<tr>
<td>Electrified Floor Options</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>D739</td>
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<tr>
<td>Unclassified Painted Decking</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>D744</td>
<td></td>
</tr>
<tr>
<td>Form Deck</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>D780</td>
<td></td>
</tr>
<tr>
<td>Fluted Deck/3-1/4&quot; LW Concrete</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>D782</td>
</tr>
<tr>
<td>Unprotected Floor/Ceiling Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D925</td>
</tr>
</tbody>
</table>

### Concrete Systems

| Pan-Joist/Poured-In-Place       | • | J701 |
| Slab/Poured-In-Place            | • | •   |
| Precast/Tees                    | • | •   |
| Precast/Hollow Core             | • | •   |

### Roof/Ceiling Systems

| IRMA Roof                       | • | P714 |
| Polystyrene Foam Insulation     | • | P732 |
| Polysioxyanurate Foam Insulation| • | P732 |
| Spray Polyurethane Foam Insulation| • | P733 |
| Mineral Fiber Board/Fiberglass Roof Insulation | • | P732 |
| Lightweight Insulating Concrete Roof Deck | • | P936 |

### Beams/Joists

| Beam Only — Floor Systems       | 1 | •     | • | • | • |
| Joist Only — Floor Systems      | 1 | •     | • | • | • |
| Beam Only — Roof Systems        | 1 | •     | • | • | • |
| Joist Only — Roof Systems       | 1 | •     | • | • | • |

### Columns

<table>
<thead>
<tr>
<th>(Size)</th>
<th>(Metric Equivalent)</th>
<th>(Metric Equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6 x 9</td>
<td>To (W150 x 13)</td>
<td>X772, Y715</td>
</tr>
<tr>
<td>W14 x 730</td>
<td>(W360 x 1086)</td>
<td>X771, Y710</td>
</tr>
<tr>
<td>W-shaped Steel Column</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Tube and Pipe Columns</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Concrete Filled Pipe Column</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

### 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.

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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.
### Unrestrained Assembly Rating (Hr.)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1 1/2</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam &amp; Steel Deck</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Joist &amp; Steel Deck</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

- **Note:** Flutes above beams and joists must be filled unless otherwise allowed in the specific fire resistance design.
Grace offers a complete line of building products to help protect your most important structures. Remember to cross reference our other catalogs.

**KEY FIRE PROTECTION PRODUCTS SALES LOCATIONS**

**WORLDWIDE HEADQUARTERS**
W. R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140-1692
USA
1-866-333-3SBM (3726)
Fax 800-778-2885

**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:

**UNITED STATES**

**Eastern Region**
Massachusetts
62 Whittemore Ave.
Cambridge, MA 02140-1692

**Southern/Central Region**
Alabama
2601 Commerce Boulevard
Ironton, AL 35210

**Western Region**
California
2510 S. Garnsey Street
Santa Ana, CA 92707

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Fax 905-683-5947

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Fax: 514-366-0727

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Fax 44-(0)-1753-637-616

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Fanling
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Fax 852-2-675-9193

**AUSTRALIA**

W.R. Grace Australia Ltd.
Tel. 61-2-9743-8811
Fax 61-2-9743-8539

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866-333-3SBM (3726)

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