

Performance Under Fire



Monokote[®] Fire Protection Systems

Introduced by:

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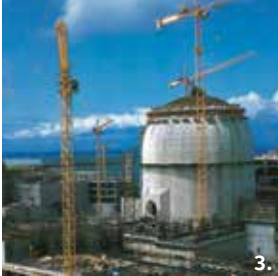


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Monokote®

FIREPROOFING



ABOVE: **Taipei Financial Centre, Taipei, Taiwan.** Also known as Taipei 101, this 508-metre structure makes a striking addition to Taipei's city skyline. Monokote® MK-6®/HY® and Z-146 were sprayed onto the structural beams and columns, and columns of the high-speed elevator shafts of this landmark project.

Your project is My project



7.



8.



9.



10.



11.



12.



13.

1. Tianjin World Financial Centre, Tianjin, China
2. World Trade Centre III, Beijing, China
3. Wolsung Nuclear Power Plant, S. Korea
4. ION Orchard, Singapore
5. Esplanade - Theatres on the Bay, Singapore
6. Taipei Financial Centre, Taipei, Taiwan.
7. Cheung Kong Centre and International Finance Centre II, Hong Kong
8. Central Government Complex, Hong Kong
9. CCTV Building, Beijing, China Mainland
10. Petronas Twin Towers, Kuala Lumpur, Malaysia
11. International Commerce Centre, Hong Kong
12. JR Central Station, Nagoya, Japan
13. Incheon International Airport, Incheon, S. Korea

Interior Concealed Fireproofing

MONOKOTE® MK-6®/HY®

Proven in-place performance on interior structural steel makes it the most widely used fireproofing material in the world. MK-6/HY is a low cost, gypsum-based, cementitious, spray-applied fireproofing product designed for an easy, fast application to steel and concrete substrates. MK-6/HY incorporates application benefits, including GCP's exclusive injection technology for fast set and improved hangability.



Chek Lap Kok International Airport, Hong Kong

■ Typical Uses

- High-rise commercial office buildings
- Conventional buildings
- Hotels, resorts and casinos
- Health care facilities, sports centres
- Schools and museums
- Airport terminals

■ Benefits

- High bond strength
- Quick set in 15 minutes
- Resists damage from air erosion and abrasion
- Gypsum-based formulation contains no mineral fibres
- No topcoat or surface sealer required

■ Performance Characteristics*

| PHYSICAL PROPERTIES | Monokote® MK-6/HY Recommended Specification | Test Method |
|--|--|-------------|
| Dry density, minimum average | 240 kg/m ³ (15 pcf) | ASTM E 605 |
| Bond strength | 9.6 kN/m ² (200 psf) | ASTM E 736 |
| Compression strength @ 10% deformation | 68.9 kN/m ² (10.0 psi) | ASTM E 761 |
| Air erosion | Max. 0.00 g/m ² (0.000 g/ft ²) | ASTM E 859 |
| High velocity air erosion | No continued air erosion after 4 hours | ASTM E 859 |
| Corrosion | Does not contribute to corrosion | ASTM E 937 |
| Bond impact | No cracking, spalling or delamination | ASTM E 760 |
| Deflection | No cracking, spalling or delamination | ASTM E 759 |
| Resistance to mold growth | No growth after 28 days | ASTM G 21 |
| Surface burning characteristics | Flame spread = 0, Smoke developed = 0 | ASTM E 84 |
| Combustibility | Less than 15 MJ/m ² 20 kw/m ² peak heat release | ASTM E 1354 |

* Actual laboratory tested values meet or exceed GCP's recommended values. Test reports are available upon request.

Interior Exposed Fireproofing

MONOKOTE® Z-106/HY

A portland cement-based, medium density fireproofing product that provides excellent moisture resistance and durability for interior, exposed applications. Z-106/HY incorporates application benefits including GCP's exclusive injection technology for fast set and improved hangability. It provides highly cost-effective installation while assuring the specifier of high performance in-place characteristics.



Korean Airlines Cargo Terminal, Incheon International Airport, Incheon, S. Korea

■ Typical Uses

- High-rise commercial office buildings
- Transportation terminals
- Convention centres
- Swimming pools
- Parking garages
- Light manufacturing facilities
- Mechanical rooms
- Elevator shafts
- Power plants
- Dockyards

■ Benefits

- Cement-based formulation provides high bond strength
- Quick set in 15 minutes
- Damage-resistant surface resists air erosion, abrasion and impact damage
- Can be trowel-finished for improved aesthetics
- Withstands high humidity and condensation
- Proven performance with moisture exposed ASTM Bond and Compressive Tests

■ Performance Characteristics*

| PHYSICAL PROPERTIES | Monokote® Z-106/HY Recommended Specification | Test Method |
|---------------------------------|---|-------------|
| Dry density, minimum average | 350 kg/m ³ (22 pcf) | ASTM E605 |
| Bond strength | 94.5 kN/m ² (2,000 psf) | ASTM E736** |
| Compression, 10% deformation | 689.4 kN/m ² (100.0 psi) | ASTM E761** |
| Air erosion | Max. 0.00 g/m ² (0.000 g/ft ²) | ASTM E859 |
| High velocity air erosion | No continued erosion after 4 hours | ASTM E859 |
| Corrosion | Does not contribute to corrosion | ASTM E937 |
| Bond impact | No cracking, spalling or delamination | ASTM E760 |
| Deflection | No cracking, spalling or delamination | ASTM E759 |
| Resistance to mold growth | No growth after 28 days | ASTM G21 |
| Surface burning characteristics | Flame spread = 0, Smoke developed = 0 | ASTM E84 |
| Combustibility | Less than 5 MJ/m ² total, 20 kw/m ² peak heat release | ASTM E1354 |

* Actual laboratory tested values meet or exceed GCP's recommended values. Test reports are available upon request.

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

Exterior Exposed Fireproofing

MONOKOTE® Z-146

High density, cement-based fire protection delivers maximum protection for interior or exterior exposed applications. Its physical characteristics are excellent for areas exposed to environmental or climatic conditions.



National Semiconductor Facility, South Portland, Maine, USA

■ Typical Uses

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

■ Benefits

- Cement-based formulation provides extremely high bond strength
- Tough, concrete-like surface resists air erosion and abrasion
- Trowelable finishing for improved aesthetics
- Releases no particulate matter or volatile organics to interfere with sensitive computer chip manufacturing environments
- Resists freeze/thaw, wind and rain

■ Performance Characteristics*

| PHYSICAL PROPERTIES | Monokote® Z-146 Recommended Specification | Test Method |
|---------------------------------|---|-------------|
| Dry density, minimum average | 640 kg/m ³ (40 pcf) | ASTM E605 |
| Bond strength | 478 kN/m ² (10,000 psf) | ASTM E736** |
| Compression, 10% deformation | 3,447.4 kN/m ² (500.0 psi) | ASTM E761** |
| Air erosion | Max. 0.00 g/m ² (0.000 g/ft ²) | ASTM E859 |
| High velocity air erosion | No continued erosion after 4 hours | ASTM E859 |
| Corrosion | Does not contribute to corrosion | ASTM E937 |
| Bond impact | No cracking, spalling or delamination | ASTM E760 |
| Deflection | No cracking, spalling or delamination | ASTM E759 |
| Resistance to mold growth | No growth after 28 days | ASTM G21 |
| Surface burning characteristics | Flame spread = 0, Smoke developed = 0 | ASTM E84 |
| Combustibility | Less than 5 MJ/m ² total, 20 kw/m ² peak heat release | ASTM E1354 |

* Actual laboratory tested values meet or exceed GCP's recommended values. Test reports are available upon request.

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

International Standard of Manufacturing

Monokote® fireproofing products applied in Asia are produced in our ISO 9001 certified manufacturing facility in South Korea. The GCP manufacturing facility, Incheon, Korea, is under the Underwriters Laboratories Inc's Follow-up Service Programme. Monokote products are manufactured under strict quality control, in accordance with our formulations and specifications. The facility's location also ensures prompt delivery of quality Monokote fireproofing products to meet the most demanding construction schedules.

Professional Installation

Product quality alone does not guarantee success. It requires professional installation from well trained and experience applicators. GCP has a network of applicators that have trained in the proper application and installation of Monokote® fireproofing. The proper application and installation of fireproofing is critical to its long-term performance and its ability to meet the required hourly ratings. GCP has a world class training program that provides instruction and guidance to its network of experienced applicators. This training along with GCP's technical support and field assistance provide our network of applicators the guidance and support to efficiently and effectively apply Monokote products.

Fire Test Approvals

Monokote® fireproofing has been tested world-wide and has the following global approvals, which includes over 120 design listings at Underwriters laboratories Inc. (UL).

| | |
|----------------|---------------------------------------|
| USA | UL 263/ASTM E 119 |
| Japan | JIS A 1304 |
| Spain | EN13381 Series |
| UK | BS476 Parts 20, 21 and EN13381 Series |
| Canada | ULC S101/ASTM E 119 |
| France | EN13381 Series |
| Germany | DIN4102 and EN13381 Series |
| Korea | KSF-2257 |
| China | GB 14907 |



GCP manufacturing facility in Incheon, S. Korea



Top: Reputable hardware (continuous mixer) is deployed; Bottom: A proper and safe job site setup is crucial in achieving the product's designed in-place performance and in meeting the construction schedule.

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