

Monokote® MK-6 HY

A spray applied structural fire protection system
Low density gypsum plaster with enhanced set characteristics and product yield

Description

Monokote® MK-6 HY is one of the world's most widely specified and used structural fire protection systems. Monokote® MK-6 HY is gypsum based (with no mineral fibres), machine applied fire protection system. It is a cost effective and fast application system for the fire protection of steel and concrete structures. Monokote® MK-6 HY bonds tightly to steel and concrete substrates, forming a hard surface which does not spall, dust or flake. Being gypsum based, is not designed for continuous exposure to weather or water. In both BS476 and the new European Standards the fire resistance performance of elements is judged against the three criteria of load-bearing capacity, integrity and insulation. The European Classification System will use the abbreviations of R, E and I respectively.

MK-6 HY is to be used with Grace Injection system and Monokote® Accelerator to reduce the set time and improve product yield. The applied fireproofing will set typically within 15 minutes; thus, allowing the operative to apply a second coat almost immediately. This unique fast setting properties enables MK-6 HY to withstand adverse weather conditions encountered during the construction phase. It is, therefore, ideally suited for application to the building whilst in its "open envelope" stage.

Advantages

Longevity: If undisturbed, Monokote® is designed to last for the life of the building.

Proven in-place performance: Thanks to its "specific" mechanical properties, with over 80% of binding agents, MK-6 HY will stay in place during construction phase, for the life of the building until the day of the fire and meanwhile the intervention of the firefighters.

Safety: Monolithic barrier with no joints and not reliant on a chemical reaction.

Thin system: No need to allow the room between steels and over-cladding for expansions that is required for Intumescent Coating.

Quality: On site quality control done by using our unique Grace Yield Kit Box.

Low density: Less net weight applied on the structures

Value for money: Direct application on unprimed steel with no corrosion pre-treatment in a C1 environment (BSEN ISO 12944-2:1988).

Program Benefit: Installation to start as soon as the concrete deck of the floor above is poured.

Typical applications

- * Structural fire resistance
 - Steel beams & columns
 - Composite deck
 - Concrete
 - Cellular beams¹
- * Refurbishment or new construction

Approvals

Monokote® MK-6 HY has been fully tested and assessed under BS 476 part 21:1987. The A/V chart is applicable to MK-6 HY and is also found in the Association for Specialist Fire protection,(ASFP) "Yellow Book".

Accessory Products

Grace has developed the Monokote® MK-6 HY Extended Set to allow lines to be left filled at the end of the day, overnight or over the weekend, therefore eliminating the need to pump in or pump out. The extra benefits of this product to the applicator include improved productivity and elimination of waste water and the associated disposal costs. This product can not be used without injection.

Application

As Monokote® is a life safety system Grace recommends that application of Monokote® MK-6 HY is done by Grace trained installers and who are also members of FIRAS and ASFP.

Surface preparation

Prior to the application of Monokote® MK-6 HY, an inspection shall be made to determine that all steel surfaces are acceptable to receive fireproofing. The steel shall be free of oil, grease, rolling compounds or lubricants, loose mill scale, excess rust, non-compatible primer, lock down agent or any other substance that will impair proper adhesion. Where necessary, the cleaning of steel surfaces to receive fireproofing shall be the responsibility of the general contractor.



Please contact your Grace Representative or applicator to verify compatibilities of Monokote® with specific corrosion paints.

The application can't be done on the steel structure unless the concrete has already been poured.

Equipment

The application of MK-6 HY involves the use of an accelerator system, injected into the product at the nozzle of the spray gun.

Mixing

Monokote® MK-6 HY shall be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproofing. The mixer shall be kept clean and free of all previously mixed material. The mixer speed in a conventional mixer shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 640–720 kg/m³ of material. Over-mixing Monokote® will reduce pumping rate.

Using a suitable metering device and a conventional mixer, all water shall be first added to the mixer as the blades turn. Mixing shall continue until the mix is lump-free, with a creamy texture. All material is to be thoroughly wet.

Temperature & Ventilation

An air and substrate temperature of 4°C minimum shall be maintained for 24 hours prior to application, during application and for a minimum of 24 hours after application of Monokote®.

Provisions shall be made for ventilation to properly dry the fireproofing after application. In enclosed areas lacking natural ventilation, air circulation and ventilation must be provided to achieve a minimum total fresh air exchange rate of 4 times per hour until the material is substantially dry.

Application Features

The application of MK-6 HY involves the use of an accelerator system, injected into the product at the nozzle of the spray gun. The accelerator reacts with the gypsum resulting in three unique advantages:

- The MK-6 HY expands significantly immediately following its installation, thereby giving the product its installed efficiency and high yield (HY) designation.
- The applied fireproofing will set typically within 15 minutes. This unique accelerated set advantage allows the operative to apply a second coat (where applicable) almost immediately.
- Because MK-6 HY sets quickly, it provides a more durable surface against weather and damage inflicted by subsequent trades.

Environment

Grace Construction Products has made a commitment to manufacturing fireproofing products that utilize recycled materials wherever possible. On an annual basis, Monokote® product lines use approximately 23 million pounds of recycled materials

Typical Specification

The following is a typical specification clause for Monokote® MK-6 HY Fire Protection of the Steel Beams/Columns/Concrete Deck is to be gypsum based, machine applied fire protection system, accelerated to provide a 15 minute set time.

Additional information

Monokote® MK-6 HY can be used without the injection system; however, there won't be high-yield nor fast set features. Neither case affects the fire performance of the product.

Health & Safety

Read the product label and Material Safety Data Sheet (MSDS) before use. Users must comply with all risk and safety phrases. MSDS's can be obtained from Grace Construction Products or from our website at www.graceconstruction.com

Technical Services

For assistance with detailing and problem solving please contact our Technical Department on +44 (0)1753 692929

Performance

Product Property	Value	Test Method
Combustibility	Class 0	BS 476 parts 6 & 7
Dry Density	260 kg/m ³ (16 pcf)	ASTM E 605
Bond Strength	16.2 KPa (339 psf)	ASTM E 736
Air Erosion	0.000 kg/m ²	ASTM E 859
Compressive Strength @ 10% Deformation	68.9 KPa (1440 psf)	ASTM E 761
Coverage/bag at 25 mm	3.9 m ²	
Colour	Grey	

Dry Thickness Required (mm)

Fire Rating A/V	30 min		60 min		90 min		120 min		180 min		240 min	
	Columns (1)	Beams (2)	Columns (1)	Beams (2)	Columns (1)	Beams (2)	Columns (1)	Beams (2)	Columns (1)	Beams (2)	Columns (1)	Beams (2)
Hp/A Up to												
30	10	10	10	10	15	10	15	10	20	12	25	16
50	10	10	10	10	15	10	15	12	21	18	28	25
70	10	10	10	10	15	11	17	15	27	24	37	33
90	10	10	10	10	15	13	20	18	32	29	44	40
110	10	10	11	10	17	15	23	21	37	33	51	48
130	10	10	11	10	19	17	26	23	41	37	56	51
150	10	10	12	10	20	18	29	25	45	41	62	56
170	10	10	13	11	22	19	31	27	49	44	66	60
190	10	10	14	12	23	20	33	29	52	47	71	64
210	10	10	14	12	24	21	34	31	55	50	75	68
230	10	10	15	13	26	23	36	32	57	54	78	71
250	10	10	16	13	27	23	38	34	59	55	81	74
270	10	10	16	14	28	24	39	35	62	58	84	77
290	10	10	17	14	28	25	40	36	64	59	n/a	79
310	10	10	17	15	29	26	41	37	66	60	n/a	82

Notes:

(1) Four sided protection, fire tested at 550°C

(2) Three sided protection, fire tested at 620°C

(3) Tested in accordance with BS 476, Part 21:1987

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