

# MONOKOTE<sup>®</sup> Z-146PC

Lightweight, high density, ceramic type inorganic fireproofing, formulated with corrosion inhibitor

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## Product Description

MONOKOTE<sup>®</sup>Z-146PC has been developed by GCP Applied Technologies as a superior product to protect steel and concrete meeting the harshest conditions found in petrochemical processing, refining facilities, LNG facilities, nuclear and conventional power plants, etc.

Monokote Z-146PC is a bauxite ceramic fireproofing based on hydraulic binders formulated with a strong patented corrosion inhibitor (DCI<sup>®</sup>) requiring only the addition of water to form a consistent slurry easy to apply. Weighing about 65%-75% less than standard concrete, it can be applied in one or multiple layers up to the desired fire rating.

Monokote Z-146PC is supported by GCP Applied Technologies with over 60 years experience in the fireproofing business and with many worldwide references available upon request.

## Features & Benefits

- Tested in accordance with:
- Hydrocarbon pool fire up to 4 hours as per:
- UL 1709 / ASTM E-1529
- Lloyd's Register of shipping for offshore structures
- BS 476 Part 20 Appendix D
- Norwegian Petroleum Directorate
- EN 1993-1-2: 2005
- UL investigated for exterior exposure under freeze/thaw cycles, salt spray, accelerated aging, high humidity and polluted industrial atmosphere
- HSE OTI 95634 jet fire up to 2 hours
- Baker blast explosion test
- NFPA 58 fire and hose stream for LPG tanks
- LNG immersion test for cryogenic spillage
- **Durability** – Monokote Z-146PC sets and dries to a hard ceramic type coating offering very good resistance against physical impacts occurring during routine operations and maintenance at the facility. Monokote Z-146PC has been tested for bond strength, compressive strength, hardness and other properties in accordance with API RP 2218 and ASTM in-place performance standards.

- **Application versatility** – Monokote Z-146PC can be mixed in standard plaster mixers. After mixing it may be spray-applied with commonly available pumping and spraying equipment for high speed efficient application. Monokote Z-146 PC can also be applied with trowels or poured into wood formworks.
- **Economical** – Monokote Z-146PC offers the most economical fire resistance by reducing labor time both in interior as well as in exterior corrosive environments, such as those defined by ISO 12944-2.
- **Other key advantages** – Application by qualified companies, extensive track records, superior bond and mechanical properties, very low thermal conductivity, up to 1 in. (25 mm) per coat, high yield rates, worldwide technical assistance and product availability, non flammable and non combustible, asbestos free, chloride and sulfide free, no contribution to smoke generation during a fire.

## Conditions not Recommended

- Operating temperatures in excess of 93 °C
- Use over aluminum or other non-ferrous substrates
- Use as a refractory material

## Coatings Requirement

- **Primers** – Monokote Z-146PC has been formulated with a patented corrosion inhibitor (DCI) that has shown to retard the rate of corrosion due to chlorides and other aggressive environmental conditions. However Monokote Z-146PC shall not be used as an anticorrosive material, thus we always recommend the use of an alkaline resistant, immersion grade, epoxy anticorrosive paint (or system) compatible with Portland cement.
- **Topcoats** – Generally not required, however in corrosive environments a compatible topcoat should be used to extend the life expectancy of the entire system. Contact GCP Technical Service for further recommendations.

## Inspection

Prior to the application of Monokote Z-146PC, an inspection shall be made to determine that all substrates are acceptable to receive fireproofing. Substrates shall be free from any substance that would impair the adhesion of the fireproofing and shall be compatible with Portland cement materials.

It is recommended that all substrates protected by fireproofing be routinely inspected as part of an ongoing facilities maintenance program. GCP should be consulted for proper patching procedures.

## Mixing

Monokote Z-146PC shall be mixed by machine in a conventional paddle type mixer. The mixer shall be kept clean and free of all previously mixed material. The mixer speed shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 835 – 945 kg/m<sup>3</sup>.

Using a suitable metering device and mixer, approximately 15 liters of potable water per bag shall be first added to the mixer as the blades turn. Add Monokote Z-146PC and mix about 90-120 seconds until the mix is lump-free with a creamy texture. Over-mixing will reduce pumping rate and density.

For more details consult our Petrochemical Application Guidelines.

## Performance Characteristics

PHYSICAL PROPERTIES	RECOMMENDED SPECIFICATIONS	TEST METHOD/NOTES**	LABORATORY TESTED VALUE*
Dry density	Min 640 kg/m <sup>3</sup>	ASTM E605	See note below***
Bond strength	Min 4,9 kg/cm <sup>2</sup> (0,49MPa)	ASTM E736	8,8 kg/cm <sup>2</sup> (0,88 MPa)
Compressive strength @ 10% deformation	35,2 kg/cm <sup>2</sup> (3,45 MPa)	ASTM E761	60.8 psi (413.6 KPa)
Shore D hardness	40	ASTM D2240	49
Yield (coverage)	-	Theoretical	6,6 kg/m <sup>2</sup> at 10 mm
Color	-	Gray	-
VOC (off gassing) at 50 °C organic compounds C6-C28	Less than 1 PPMW (part per million by weight)	Dynamic headspace (Thermal Desorption Gas Chromatography – mass spectrometry)	Less than 1 PPMW (below detectable limits)
Leachable ammonia	Less than 50 PPB– 50 ng/mg	Leachable ion by ion chromatography	Less than 50 PPB (below detectable limits)
Thermal conductivity		UNI EN 12667:2002	0,14 W/mK at 20 °C
Thermal conductivity		UL 1709	0,17 W/mK at 565 °C
Thermal conductivity		UL 1709	0,28 W/mK at 889 °C

\* Independent laboratory tested value. Report available upon request.

\*\* ASTM international test methods modified for bond strength and compressive strength, where required, for high density, high performance products

\*\*\* All in-place performance tests should be conducted at or below the minimum recommended specification density. Test reports here were conducted at 635 kg/m<sup>3</sup>.

## Application

Monokote Z-146PC material shall not be used if it contains partially set, frozen or caked material.

Monokote Z-146PC shall have a minimum average dry in-place density of 640 kg/m<sup>3</sup>.

Monokote Z-146PC can be sprayed directly to lathed steel substrates in one or more passes. A spray gun with a properly sized orifice with spray shield, and air pressure at the nozzle of approximately 20 psi (1,4 bar) will provide the correct adhesion, density and appearance. Temperature

An air and substrate temperature of 41 °F (5 °C) minimum shall be maintained for 24 hours prior to application, during application and for a minimum of 72 hours after application. To obtain optimal strength, Monokote Z-146PC should be moist cured for a minimum of 72 hours and then be allowed to dry naturally.

## Delivery & Storage

All material to be used for fireproofing shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper UL labels for fire resistance classifications. The material shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and damp surfaces. All material that has been exposed to water before use shall be discarded. Stock of material is to be rotated and used before its expiration date.

## Safety

Monokote Z-146PC is slippery when wet. Proper signs should be used when applying wet fireproofing material. SDS (Safety Data Sheet) are available on our web site [www.gcpat.com](http://www.gcpat.com) or call toll free at 866-333-3SBM.

## Packaging

Bag weight is 50 lbs. (22,2 Kg). Truckload approximately 880-900 bags in 20" containers 42 or 48 bags per pallet plastic wrapped.

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