

MasterSeal[®] M 689

A high elastic, ultra-fast curing, spray applied 100% polyurea membrane for use in waterproofing applications

DESCRIPTION

MasterSeal M 689 is a solvent free, two-component waterproofing membrane. It is highly reactive and can only be applied by special two-component hot spray equipment.

TYPICAL APPLICATIONS

MasterSeal M 689 is used in a variety of waterproofing applications, especially where a high degree of chemical and mechanical resistance is required.

This includes:

- Waste water treatment plants (urban and industrial), both in the inflow and outflow areas.
- Sewage effluent pipelines.
- Steel and concrete pipes.
- Secondary containment bunds in chemical and petrochemical industries.

Additionally, **MasterSeal M 689** can be applied on:

- Flat and architectural roofs.
- Horizontal and vertical substrates.
- Internal and external areas.
- Concrete, cementitious mortar or steel substrates.
- Reinforced concrete to protect it against carbonation, chloride induced corrosion or chemical attack in industrial environments.

Contact your local Master Builders Solutions representative regarding any application required not mentioned here.



ADVANTAGES

- Spray delivered and ultra-fast curing: enables easy application to form a monolithic waterproofing membrane on simple and complex surfaces
 - Application to vertical surface without runs
 - Easy application to complicated details
- Rapid curing:
 - Rain resistance after only 30 seconds
 - Allows early serviceability
 - Fully trafficable after only 12 hours
- Continuous membrane: monolithic – no laps, welds or seams
- Excellent chemical resistance
- Waterproof and resistant to standing water
- Fully bonded to substrate: can be applied to a wide range of substrates with the appropriate primer
- High water vapour permeability: low risk of blistering
- High resistance to carbon dioxide diffusion: Protects concrete from rebar corrosion
- High abrasion and impact resistance: Withstand mechanical traffic
- High elasticity and crack bridging capability:
 - Remains elastic at low temperatures; Tg approx. – 45°C
 - High durability and protection with reduced cracking due to embrittlement
- Thermoset – does not soften at high temperatures
- Resistance to root penetration

PACKAGING

- PTA 200 kg in 200 L drums
- PTB 225 kg in 200 L drums

STANDARDS

CE marked according EN 1504 Part 2.
Chemical resistance according EN 13529.
Fire resistance according EN 13501 part 1.
Complies with BS 6920 - suitable for use in water tanks

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TYPICAL PROPERTIES

Properties	Result
Chemical base	100% Polyurea
Mixing ratio	100 : 100 by volume 100 : 112 by weight
Density @ 20°C	PTA 1.00 kg/L PTB 1.11 kg/L
Viscosity @ 25°C	PTA 220 mPas PTB 800 mPas
Processing temperature (Flow heater, Hose heater)	PTA 70-80°C PTB 70-80°C
Processing pressure	PTA 120-200 bar PTB 120-200 bar
Substrate and ambient temperatures (during application)	min. 5°C max. 50°C
Maximum relative humidity (during application)	90%
Maximum substrate moisture (during application)	4%
Reaction time (sprayed)	5-7 s
Dry to touch after @20°C	30 s
Ready for pedestrian traffic after @20°C	0.5 h
Fully cured – ready for car traffic after @20°C	12 h
Exposure to chemicals after @20°C	24 h

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Typical properties after curing*

Properties	Result
Density of mixed material EN ISO 2811-1	approx. 1.10 kg/L
Shore-A-hardness	92
Shore-D-hardness	42
Tensile strength DIN 53504	21 N/mm ²
Elongation at break DIN 53504	425%
Tear strength DIN 53515	> 75 N/mm
Static crack bridging EN 1062-7 (A)	A5 (+23°C)
Dynamic crack bridging EN 1062-7 (B)	B4.2 (-20°C)
Fire behavior EN 13501-1	C _{FL} -s1
Capillary water absorption EN 1062-3	0,002 kg/m ² /h ^{0,5}
Water vapor permeability (S _D) EN ISO 7783-1	< 5m / Class I (μ = 3658)
CO ₂ permeability (S _D) EN 1062-6	> 120 m (μ = 68950)
Adhesion to concrete EN 1542	> 3 N/mm ²
Adhesion strength after freeze-thaw cycles EN 13687-1	> 3 N/mm ²
Behaviour after artificial weathering EN 1062-11	No changes
Abrasion resistance (Taber H22, 1000 g, 1000 c) EN ISO 5470 -1	Mass loss < 150 mg
Impact resistance EN ISO 6272/2	>20 Nm (Class III)
Slip/Skip resistance EN 13036-4	Dry: 63 (Class II) Wet: 30
Service temperature (dry)	-20°C to +130°C
Service temperature (high moisture, but not wet)	0°C to +80°C
Service temperature (wet)	0°C to +55°C

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APPLICATION GUIDELINES

SURFACE PREPARATION

The preparation of the substrate and the use of the appropriate primer are of paramount importance. All surfaces to which **MasterSeal M 689** is applied should be sound, clean and dry and free from oil or grease, loose particles and any other substances which may impair adhesion. For substrate pre-treatment prior to the primer application see primer technical data sheet.

Concrete and cementitious screeds

Concrete and other cementitious substrates must have a minimum pull off strength of 1.5 N/mm². Any laitance present on the surface must be removed mechanically. Shot blasting is the preferred method. Release oil and other contaminants which may impair adhesion must be removed prior to the application of the primer.

Metal substrate

Should be sand blasted to a Sa 2 ½ finish prior to application of the primer.

PRIMING

Use the following guide to select the appropriate primer:

<i>Substrate</i>	<i>Primer</i>
Concrete	MasterTop P 650
Metal	MasterSeal P 616
Aged MasterSeal (PU) waterproofing membranes	MasterSeal P 691

In some circumstances, other primers may be more appropriate. For further details, please consult your local Technical Services dept.

MIXING

Dose and mix with suitable air driven or electrical two-part hot spray equipment. The accuracy of mixing and dosage must be controlled regularly with the equipment.

Stir well PTA drums before use to homogenise the content. Precondition the membrane

components to the correct temperature 70-80°C prior to application.

Check mix ratios are correct at the start of spraying and regularly throughout the spraying procedure.



PLACING / APPLICATION

MasterSeal M 689 can only be applied by means of a suitable two component heated, high pressure, proportioning spray equipment (e.g. Graco® or any other suitable). The choice of machine depends to a large extent on the type and size of work contemplated. For advice, please contact Master Builders Solutions Construction Chemicals.

MasterSeal M 689 should only be applied to properly prepared substrates. For best results substrate and air temperature should be in a range 5-35°C. However, in very cold conditions the use of barrel heaters may be required to ensure the optimal operation of barrels pumps.

MasterSeal M 689 should be applied within the recommended temperature and relative humidity limits. The temperature of the substrate should be min. 3 K above the dew point. Due to the fast reaction it is possible to rapidly build thicknesses from 1.5 to >6 mm.

Surrounding areas should be protected from overspray by masking off. Care should be taken to prevent spray mist being carried by wind by erecting suitable barrier.

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TOP COATS

MasterSeal M 689 can be used directly in exposed applications as the mechanical properties are not affected but has limited aesthetical UV resistance.

Do not topcoat **MasterSeal M 689** in case of application exposed to harsh chemical environments.

The use of pigmented **MasterSeal M 689** can avoid the application of topcoat but not avoid the surface yellowing of the membrane.

For color stability, UV resistant topcoats can be used i.e. **MasterSeal TC 256**, **MasterSeal TC 257** and **MasterSeal TC 258**, consult your local Technical Services office for further details.

CLEANING

Re-useable tools should be cleaned carefully with a suitable thinner (Xylene / MEK / Acetone).

COVERAGE / YIELD

MasterSeal M 689 is normally applied at 2.2-2.75 kg/m². This corresponds to a thickness of approx. 2.0-2.5 mm. Details require a higher coverage rate up to 4.0 kg/m² or more.

Minimum 1.65 kg/m² to achieve 1.5 mm thickness. For podium and roof waterproofing.

The above consumption figures are intended as a guide only and may be higher on very rough or porous substrates.

WATCHPOINTS

This product conforms to the EU directive 2004/42/EG (Deco-Paint directive) and contains less than the maximum allowable VOC limit (Stage 2, 2010).

According to the EU directive 2004/42, the maximum allowable VOC content for the Product Category IIA / j is 500g/l (Limit: Stage 2, 2010).

The VOC content for **MasterSeal M 689** is <500 g/l (for the ready to use product).

STORAGE AND SHELF LIFE

Store in original containers, under dry conditions and a temperature between 15-25°C. Do not expose to direct sunlight. For maximum shelf life under these conditions, see "Best before" label.

HEALTH AND SAFETY

In its cured state, **MasterSeal M 689** is physiologically non-hazardous. The following protective measures should be taken when working with this material:

Wear safety gloves, goggles and protective clothing. Avoid contact with the skin and eyes. In case of eye contact, seek medical attention. Avoid inhalation of the fumes. Respiratory protection must be worn when spraying or when in the vicinity of the spraying operation.

When working in well ventilated areas, a combined char- coal filter and particle filter mask (A-P2) should be worn. When working in less well ventilated and in confined spaces, air-fed helmets are to be worn by sprayer and assistant(s) When working with the product do not eat, smoke or work near a naked flame.

For additional references to safety-hazard warnings, regulations regarding transport and waste management please refer to the relevant Material Safety Data Sheet.


The regulations of the local trade association and/or other authorities, regulating safety and hygiene of workers handling polyurethane and isocyanates must be followed.

® = Registered trademark of the MBCC Group in many countries.


* Properties listed are based on laboratory controlled tests.

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CE-MARKING (EN 1504-2)

	
1119	
Master Builders Solutions Deutschland GmbH Donnerschweer Str. 372, D-26123 Oldenburg	
08	
468901	
EN 1504-2:2004	
Surface protection product - coatings EN 1504-2: ZA.1d, ZA.1f and ZA.1g	
Linear shrinkage	NPD
Compressive strength	NPD
Abrasion resistance	≤ 3000 mg
Permeability to CO ₂	Sd > 50
Permability to water vapour	Class I
Capillary absorption and permeability to water	< 0.1 kg/(m ² xh ^{0.5})
Thermal compatibility after freeze-thaw cycling	≥ 1.5 N/mm ²
Resistance to severe chemical attack	Reduction of hardness < 50 %
Impact resistance	Class III
Adhesion strength by pull-off test	≥ 1.5 N/mm ²
Reaction to fire	C _{fl} -s1
Skid resistance	NPD
NPD = No performance determined. Performance determined in system build up MasterSeal 6689	

CE-MARKING (EN 13813)

	
Master Builders Solutions Deutschland GmbH Donnerschweer Str. 372, D-26123 Oldenburg	
08	
468901	
EN 13813: 2002	
Synthetic resin screed for use internally in buildings EN 13813: SR-B1.5-AR1-IR4	
Essential characteristics	Performance
Fire behavior	Efl
Release of corrosive substances	SR
Water permeability	NPD
Wear resistance	< AR 1
Bond strength	> B 1,5
Impact resistance	> IR 4
Impact sound insulation	NPD
Sound absorption	NPD
Heat insulation	NPD
Chemical resistance	NPD
Slip/Skid resistance	NPD
Emissions behavior	NPD
NPD = No performance determined. Performance determined in system build up MasterSeal 6689	

MBS_CC-UAE/SI_M689_v5/04_20/v6/06_20/v7/07_20/v8/10_22/v9/07_23

STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this Master Builders Solutions publication are based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use.

NOTE

Field service where provided does not constitute supervisory responsibility. Suggestions made by Master Builders Solutions either orally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they, and not Master Builders Solutions, are responsible for carrying out procedures appropriate to a specific application.

Master Builders Solutions
Construction Chemicals LLC
 P.O. Box 37127, Dubai, UAE
 Tel: +971 4 8090800
www.master-builders-solutions.com/en-ae



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