MasterSeal® Pool 1689

A high strength, non-flow epoxy bedding and repair mortar

GENERAL METHOD STATEMENT OF MASTERSEAL M 689

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1 Scope

This document outlines the general method statement for the application and processing of the **MasterSeal M 689** system on concrete substrate, due to the general approach in this method statement, this should not be used as a project specific method statement

2 Materials

The below table describe the system built-up material from BASF Construction Chemicals UAE and shall be supplied by the applicator and shall be in accordance with the material approvals

Item	Description Of Material	Packaging
MasterSeal M 689	Two component, spray applied 100% polyurea waterproofing membrane	Part A 200kg Part B 225kg
MasterTop P 650	High grade , low- viscosity , two component epoxy primer and surface sealer	15kg
MasterSeal P 691	Single component polyurethane adhesion primer	19.5kg
MasterBrace ADH 2200 (Formerly known as Concresive 2200)	High strength , non-flow , epoxy bedding and repair mortar	3kg

3. QUALIFICATIONS

BASF - Supplier's qualifications: The supplier of the specified products shall offer a program for training, certifying, technically supporting and periodically re-certifying contractors Supplier's Site Representative should be capable of instructing successful methods for installation and also capable of explaining, technical aspects of correct material selection, mixing, use and application.
Applicator's qualifications:

- The applicator shall be experienced with both material application and surface preparation and shall supply all labor ,materials , equipment and incidental equipment required to install **MasterSeal M 689** system as specified in this method statement .
- Work shall only be executed by trained and qualified employees certified by the supplier

4. MasterSeal M 689 System – GENERAL APPLICATION

4.1. Application requirements for MasterSeal M 689

- The state of the object should be inspected and documented by both applicator and contractor.

To eliminate misunderstanding, the planned work and quality control measures should be documented and signed by both parties, before any work is undertaken

- After inspection a thoroughly documented work-plan needs to be created
- Before any application starts, the weather conditions and forecast for the required application and curing time need to be viewed. If any type of downfall or fog is expected, the application should not be commenced
- For best result Prior and during the application of **MasterSeal M 689** substrate and air temperature should be in the range 5-35˚C.
- The moisture content in concrete should be below 5%
- The temperatures should not fall below the minimum stated until the material is fully cured. the temperature of the substrate must be at least 3˚C above the dew point both during the application and for at least a further 2 hours (at 15˚C)
- At elevated wind speeds, make sure that continuation of the spray activities will not damage other nearby objects, due to overspray , In general exterior spray with wind speed more 30Km/h is not recommended, high wind speed will lead to higher consumption since particles are blown away and do not arrive on the substrate. Protective screens can be used to protect the application against the high wind speed
- To minimize out gassing, apply primer and polyurea coating when air and surface temperatures are falling

4.2 Surface preparation

- The preparation of the substrate and the use of the appropriate primer are of paramount importance
- Concrete and other cementitious substrate must have a minimum pull off strength of 1.5 N/mm²
- It is recommended to abrasive blast (e.g. high pressure water blasting, abrasive blast cleaning) the substrate
- Acid etching should not be used
- If any part of the floor is contaminated by oil, grease or fuel, the contamination should be removed before other forms of preparation are undertaken.
- Prepare the concrete substrate using the chosen method, removing all laitance and weak, friable concrete or high spots

High pressure water blasting

Mechanical preparation for the substrate, Blast Cleaning

- The finished substrate should have a uniform structure and surface profile, the substrate profile is defined within the ICRI guideline No.03732 (International Concrete Repair Institute). For optimum performance , the concrete surface profile should be between 3 and 5

- Surface defects exposed during surface preparation such as shrinkage cracks, blow holes, minor honey combing, and minor damage to joint arises, etc. shall be filled with **MasterBrace ADH 2200** thixotropic two component surface filler.

- Larger repairs can be carried out using products from **MasterEmaco repair range**

- Joints with greater movement such as expansion joints should be treated in greater detail and should never be sprayed over directly

- When spraying inside corners it is advised to create an inside radius to prevent a 90˚ intersection

- When surface preparation is complete, vacuum the area to remove all dust and debris

- Make sure to mask of any areas which are not to receive coating , such as walls and others

- It is advised to spray a test area to determine the adhesion, this test area should be in the more critical areas

Vacuum cleaning for the substrate

4.3 Application of Primer (MasterTop P 650)

- **MasterTop P 650** is a high grade, low viscosity, two-component epoxy primer and surface sealer.

- **MasterTop P 650** designed for use as a primer on mineral substrates such as concrete and cementitious screed.

- Mix the A and B components of **MasterTop P 650** together, for a minimum of one until it is free of streaks.

- Apply the mixed **MasterTop P 650** to the substrate, using a medium pile roller at the rate of **0.15-0.3kg/m²** depending on the absorption of the substrate and surface texture.

- On porous surface a maximum of 0.5 litres of **MasterTop THN 2** per 15kg unit of primer may be added to improve penetration.

- **MasterTop P 650** should be applied within the pot life (refer to the TDS)

- Before Applying **MasterSeal M 689** allow **MasterTop P 650** to be tack-free , otherwise trapped air in the substrate expanding on the application of the spray apply polyurea

- If the primer has been allowed to dry more than 6-12 hours (depend on the temperature) then a fresh coat of primer must be applied and allowed to be tack-free prior to start **MasterSeal M 689** application.

4.4 Spray Equipment for the application of MasterSeal M 689

- **MasterSeal M 689** can only be applied by means of a suitable two component hot spray high pressure spray machine.
  (e.g. Graco Reactor 2 E-XP2)

- The mixing ratio by volume is 1:1 (resin : isocyanate)

- The used spray machine should be capable of offering the required pressure (120-200 bars), temperature (70-80˚C) and consistency of temperature at the required flow rate. This should be checked on daily basis by doing correct setup check which involves the spraying of a sample

Two component hot spray high pressure spray machine

- The pressure gauges need to be monitored during the application, the observed pressures should be equal and stable. a pressure drop normally indicates a blockage at the feeding end

- Both components must be heated up to between 70 ˚C-80˚C

- Processing pressure for both components should be 120-200 bar

- The spray machine hose system must be thermally insulated to minimize heat loss, cover with an abrasion resistant covering to protect the hoses and its electrical components; the minimum recommended hose length is 15 meters.

Air purge Gun

- A proper spray gun should be used (e.g. Probler P2 Gun , Air Purge Gun), the function of the spray gun is to mix the 'A' and 'B' components and discharge the mixture in a uniform spray pattern. The trick with spray guns is to mix and spray out the 'A' and 'B'

Probler P2 Gun

components without the mixed material reacting in or on the gun

- Recommended mix chamber to be round pattern gun (e.g. AR 2929, AR 4242)

- quipment and hoses must be flushed with appropriate non-solvent, inert chemical, when not in use for prolonged periods such as **MasterTop THN 2**

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4.5 Application of MasterSeal M 689

- **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.

- **MasterSeal M 689** is 2 component
  Part A: Resin approx. Grey **(Stir well before use)**
  Part B: Isocyanate / Unpigmented

  Part A the resin component needs to be thoroughly stirred or agitated prior to use

  Part A should be mixed using a drum mixer, mix at low speed 300-400rpm for 20 minutes. **DO NOT** mix at higher speed in order to avoid air entrapment.

- **MasterSeal M 689** normally applied at 2.2-2.5 kg/m², this corresponds to a thickness of approx. 2.0-2.3mm.

- Apply **MasterSeal M 689** at a consistent rate using a standard cross-hatch spray pattern; sequential layers should be applied in a crisscross application, 90˚ difference in direction of spray to insure good coverage.

- In one pass, the minimum applied quantity should be 0.7mm (approx. 0.7kg/m²)

- Layer thickness can be estimated and documented based upon total consumption and total surface area. Based upon the average density of 1kg/l.

- Details will require higher coverage rate up to 4.0 kg/m² or more.

- Full cure is normally achieved within 12 hours at 20˚C

Re-Coating intervals

Next layer	Hours min.			Hours max.		
	Temperature [°C]			Temperature [°C]		
	10	20	30	10	20	30
MasterSeal M 689	**immediately**			8	4	2

Part A Part B

Drum Mixers

Application of MasterSeal M 689

4.6 Application of MasterSeal P 691 (Aged MasterSeal membranes)

- **MasterSeal P 691** is a single component polyurethane adhesion primer
- **MasterSeal P 691** is designed as an adhesion promoting primer between build up layers of **MasterSeal M 689**
- If the re-coating times are exceed ,or rain falls on the **MasterSeal M 689** then allow to dry thoroughly and apply **MasterSeal P 691,** the distance of the overlap to be prepared shall be 200-250mm.
- If the re-coating interval exceed 14 days, **MasterSeal M 689** must be lightly abraded and the dust removed by vacuum cleaning and solvent wipe prior to the application of **MasterSeal P 691**
- Prior to apply **MasterSeal P 691** the base layer must be clean and dry and free from oil, grease and loose material and any other contamination which might impair adhesion.
- Shake the container prior to decanting and apply by roller, brush or spray
- For best results, materials, substrate and air temperature should be in the range 15-25˚C
- **MasterSeal P 691** is moisture curing and will foam if applied thickly. It is important to apply thinly
- **MasterSeal P 691** normally applied at 0.05-0.10kg/m²
- Following application, **MasterSeal P 691** should be protected from direct contact with water, including dew or condensation, which will impair adhesion to the subsequent coat
- Ensure that the solvent contained in the material is allowed to flash off completely before applying the subsequent coat
- The curing reactions are influenced by ambient, material and substrate temperatures. Low temperatures lengthen the open and curing times. High temperatures shorten open and curing time.

Re-coating intervals

Recoat intervals at 23˚C 50% RH	
Minimum / Hours	**1**
Maximum / Hours	**24**

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5. Repair and maintenance of MasterSeal M 689

- Before any application or surface preparation can be started, a thorough evaluation of the **MasterSeal 689** should be undertaken. this should involve the followings

  A review on the spray log, generated from the application of the aged **MasterSeal M 689**
  A durometer check on the hardness of the existing coating (preferably according to DIN 53505)
  A general assessment on the surface which needs to be recoated, especially a detailed check on any

- In order to achieve adequate adhesion between **MasterSeal M 689** and the new coat, surface pre-treatment consisting of the following next steps is required:

  All loose parts on the surface need to be removed as well as any debris that might influence adhesion
  If there is delamination due to contaminants on the concrete, removing the contaminated concrete is required following by priming
  The area which is pre-treated should be at least 100mm larger than the surface which needs to be repaired
  Abrade the surface by using a slow moving rotary disc with coarse grain for example a Zec-disc

Zec-disc

  All sharp edges need to be feathered down, to allow a smooth transition from existing coating into the new coat
  Solvent wipe the abraded surface using for example Xylene
  The solvent used should not be poured onto the surface but transferred using clean cloth used for wiping. This to prevent extreme soaking of the solvent into the coating
  Leave enough time to allow for full evaporation of the solvent
  Once all preparation finish , the surface should be cleaned and free from dust
  Prior to apply repair material it is necessary to use a primer , **Mastertop P 650** to be used on concrete surface and **MasterSeal P 691** to be used between old and new coat of the polyurea

- Following the surface preparation finish , Spray **MasterSeal M 689** into the damaged area following the same procedure at section (4.5)

6. Application of MasterSeal TC 681 - If required (UV-Resistant Coating)

- **MasterSeal M 689** is UV stable but not color stable , cured coating system may exhibit discoloration when exposed to sunlight, if UV resistance required **MasterSeal TC 681** should be applied as a top coat

- **MasterSeal TC 681** is a single component elastomeric pigmented polyurethane coating designed for application in heavily trafficked areas. It provides a UV-resistance, hard-elastic surface resistance to chemicals and abrasion.

- Thoroughly mix the **MasterSeal TC 681** using a slow speed (300-400 RPM), drill with suitable mixing head

- Apply one coat of **MasterSeal TC 681** by medium pile roller or squeegee. Coverage rates should be 0.60-0.90 kg/m² per coat. **MasterSeal TC 681** should be applied to dry and clean surface

- Allow to cure for at least 24 hours

7. Application of MasterTop SR 3 - if required (Slip resistance)

- If a hard wearing, slip resistant finish is required, **MasterTop SR 3** silica sand can be broadcasted between two layers of topcoats.
- Apply the first coat of **MasterSeal TC 681** by medium pile roller or squeegee, with a coverage rate of 0.45 kg/m² and then immediately broadcast 1.0 kg/m² of **MasterTop SR 3.**
- Allow to cure for at least 5 hours and then remove excess aggregates prior to over coating.
- Apply a final coat of **MasterSeal TC 681** by medium pile roller or squeegee, with a coverage rate of 0.45 kg/m²
- Allow to cure for at least 24 hours

8. Inspection and Quality Control

- The applicator is responsible for the initial acceptance of the substrate which is to be coated

- Quality control of the surface preparation and coating application are the responsibility of the applicator

- Quality control equipment should be available all the time on site

- A daily quality control documents needs to be filled in and signed on daily basis, this document should entail:

    1. All application steps and inspection data
    2. All used products with batch numbers
    3. Equipment data such as: material temperature, pressure, maintenance sequences, unscheduled application stops and its reasons / purpose, applied quantities.
    4. Environmental conditions such as temperature, relative humidity, dew point, substrate temperature

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- Before the application started, a free-film sample should be sprayed and evaluated. The sample should also be stored for future reference

- After the application of **MasterSeal M 689**, dry film thickness should be measured, in case of low film thickness the area can be over sprayed to achieve the required dry film thickness
- Pull - off test for adhesion can be tested if required

Pull-off Tester

Dry Film Thickness Gauge

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9. Safety

9.1 Material Storage

- Store in original containers under dry conditions at a temperature between 15˚-25˚C. Do not expose to direct sunlight

9.2 Personal Protection

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

- Any possible risks or hazards in regards to handling of chemicals such as, first aid measures, personal protective equipment, storage, transport, spillages and such can be found in the safety data sheet

- All personals, involved with the application, should have read and understand the safety data sheets and labels of all the used material

- All personals, involved with the application, should 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 charcoal 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

- When working with the product do not eat, smoke or work near a naked flame

- The protective equipment used shall be in accordance with local safety regulations. The applicator needs to know and understand the regulation in regard to safety, environmental control and others.

Air-Fed Helmet

Charcoal Filter Mask

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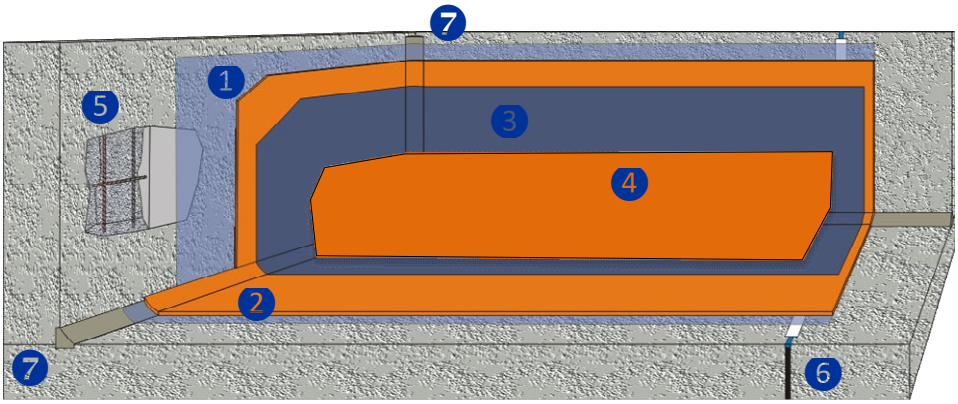

1.- Primer
2.- Bonding

3.- Membrane

4.- Finishing layer

5.- Concrete Repair
6.- Joint Sealing
7.- Covings

	Product	Thickness approx.	Consumption approx.
1. Primer			
primer	**MasterSeal P 385** Epoxy-cement based primer and levelling coat for MasterSeal M membranes applied on damp surfaces	1 mm	1,5 kg/m²
2. Pore sealing and bonding			
Bonding agent	**MasterSeal P 770** 2-component primer based on Xolutec - Technology for MasterSeal System	0,2 mm	0,25 kg/m²
Alternative bonding agent	**MasterTop P 686 W** Waterborne, two component, epoxy resin based primer		
3. Membrane			
Membrane	**MasterSeal M 689** Highly elastic, ultra fast curing, spray applied 100% polyurea membrane for use in waterproofing applications	2 mm (1 coat)	approx. 2.1 kg/m²

MasterSeal® Pool 1689

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	Product	Volume approx.	Consumption approx.
4. Finishing layer			
Finishing layer	**MasterSeal TC 681** 2K-Polyaspartic top coat, pigmented, glossy, fast and low temperature curing, UVstable, for car parking systems and broadcasted coatings	0,4 – 0,7 mm	0,6 -0,9 kg/m^2
5. Concrete Repair			
If concrete substrate shows corrosion related or other damages, concrete repair procedure will be necessary before the application of the waterproofing system. Check relevant SBU or TDS for more detailed information about MasterEmaco concrete repair systems.			
6. Joint Sealing (where required)			
Backer rod	**MasterSeal 920** Backer rod for joint sealing	-	1 m / m
Joint Sealing	**MasterSeal NP 474** Single-component, non-sag, tough, pick-resistant, high modulus polyurethane joint sealant for floors and walls	20 x 10 mm	200 ml / m
7. Horizontal Covings			
Wall-to-floor junctions treatment	**MasterSeal 920** Backer rod for joint sealing	-	1 m / m
	MasterSeal 912 Single component, polymer-based, hydroswelling mastic for waterproofing of construction joints.	20 mm thick	
	MasterSeal 920 Backer rod for joint sealing	-	1 m / m
	MasterSeal 590 Fast setting mortar to create covings and plug active leaks	According Application	2,0 kg/dm^3
7. Vertical Covings			
Wall-to-wall junctions treatment	**MasterSeal 590** Fast setting mortar to create covings and plug active leaks	According Application	2,0 kg/dm^3

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APPROVALS AVAILABLE

- **MasterSeal M 689**:
  - EN 1504 – 2: Initial Test Type

- **MasterSeal TC 681**:
  - EN 1504 – 2: Initial Test Type
  - EN 13529: Chemical resistance to swimming pool water

Additional information in the Technical Data Sheets.

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.
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