GENERAL METHOD STATEMENT
MASTERSEAL M 689

1 SCOPE

This document outlines the general method statement for the application and processing of pure polyurea coating, **MasterSeal M 689**. Due to the general approach in this method statement, this should not be used as a project specific method statement.

2 MATERIALS

Below table describes the list of products from Master Builders Solutions Construction Chemicals LLC as per the general system built-up. Additional products such as special primers, protective layers and topcoats may be required depending on actual conditions, substrates and material transitions. Please consult local Technical Services representative for further details based on special project conditions.

Item	Description of Material
MasterSeal M 689	Two-component, spray applied pure polyurea waterproofing membrane.
MasterTop P 650	High-grade, low-viscosity, two-component epoxy primer and surface sealer for concrete.
MasterTop SR 3	Silica aggregate additive for **MasterTop P 650** primer if additional mechanical key is required.
MasterSeal P 616	Two-component polyurethane primer for metal substrates.
MasterSeal P 691	Single-component polyurethane adhesion primer for aged membranes.
MasterBrace ADH 2200	High-strength, non-flow, epoxy bedding and repair mortar.

3 APPLICATOR QUALIFICATION

- The applicator shall be experienced with both material application and surface preparation and shall supply all workers, materials and equipment required to apply **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 GENERAL APPLICATION – MasterSeal M 689 SYSTEM

4.1 Application requirements for MasterSeal M 689

- The condition of the area to be applied should be initially inspected and documented by the applicator and shall be addressed to the contractor. Agreements regarding the suitability of the system or any recommended modification and necessary preparation should be established prior to execution of any works.

- Plan the works to be done, prioritizing critical areas and consider execution of works per zone for large areas.
- Check the weather conditions and forecast to avoid possible rain, fog, extreme humidity and sandstorms as the application is not recommended in any of this condition.
- For best result, application is advisably done under temperatures within the range of 5-50ºC.
- The moisture content in concrete should be below 5% and ambient humidity under 85%.
- Protect the surroundings from over spraying using tarpaulins or plastic sheets. This includes nearby facilities, equipment, vehicles, and other elements that could be stained by the coating.

4.2 Surface preparation

4.2.1 Concrete substrate

- Surface preparation and priming is one of the key stages in the application.
- Substrates should ideally have minimum pull-off strength of 1.5 N/mm².
- It is recommended to abrade the surface by either grinding, high-pressure water jetting or grit blasting. This method ensures removal of any friable matters, weak surface layer and defects that will affect the adhesion of the coating.
- Surface defects which were 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 epoxy filler. When creating a skim coat of **MasterBrace ADH 2200**, it is advisable to initially prime the substrate with **MasterTop P 650** to ensure penetration to substrate for optimum adhesion strength.
- Larger repairs can be carried out using products from **MasterEmaco** repair product range.
- Remove any contamination such as oil, fuel, grease on surface using suitable cleaning agents.
- Allow the substrate to dry following any cleaning, rain and/or moisture condensation, then blow any residual dust / dirt away using compressed air or collect using an industrial vacuum cleaner prior to start of any application.

4.2.2 Metal substrate

- All surfaces shall be free from oil, grease, dust, and any friable matter.
- Metal surface is ideally blast cleaned to Sa 2½ finish with average surface profile in the range of 30-50 µm.
- Wipe the surface with cleaning solvent to remove any contaminants.
- Close any small gaps and holes using a suitable sealant from **MasterSeal** range.
- Larger gaps may require sealing using **MasterSeal GP Foam** or repaired / covered with metal sheets.

4.3 Primer application

4.3.1 Concrete substrate

- Mix A and B components of **MasterTop P 650** on a dry and clean container until it is homogeneous and free of streaks.
- Apply the mixed primer to the substrate using medium pile roller at a rate of 0.15-0.3 kg/m² depending on the porosity and profile of the substrate. Re-apply primer if the substrate has noticeably absorbed the initially application.
- **MasterTop P 650** should be used within the pot life (approx. 20 minutes @25C).
- Where additional mechanical key is required, broadcast **MasterTop SR 3** silica aggregate on the wet primer at a rate of 0.6-1.0 kg/m². Consult Technical Service Representative for further details.
- Allow the primer to dry until tack free before applying **MasterSeal M 689** (6-12 hours).
- If the spray application is delayed for more than 48 hours or if noticeably contaminated with moisture, dust and/or dirt, clean the initially primed substrate and re-apply primer.

4.3.2 Metal substrate

- **MasterSeal P 616** is supplied in pre-measured two-part package. Mix Part A and B component using as slow speed mixing drill to a uniform streak free consistency.
- Apply **MasterSeal P 616** primer using brush or roller in 1-2 coats with a total approximate consumption rate of 0.16-0.20 kg/m² (120-150 mL/m²).
- Use the material within its working pot life. Application outside the pot life, even if the material appears to be fit for use, may result in inferior adhesion properties.
- Do not allow the mixed material temperature to exceed 35ºC.

4.4 Spray application – MasterSeal M 689

- **MasterSeal M 689** can only be applied by means of a suitable two-component, heated, high- pressure spray machine with mixing ratio of 1:1 by volume, capable of providing the required pressure of **130-180 Bars** and heating temperature of **70-75ºC**. (e.g. Graco Reactor 2 E-XP2 with Fusion Gun - AR2929 mixing chamber).
- **MasterSeal M 689** Part A resin is pigmented and needs to be stirred prior to use.
- **MasterSeal M 689** is normally applied at 1.65-2.75 kg/m², this corresponds to a thickness of approx. 1.5-2.5mm. Consult Master Builder Solutions Technical Services for more information regarding recommended thickness and application coverages.
- Corners and detailing should be initially sprayed with 200mm bandage width of coating as a reinforcing layer prior to the main coating layer.
- The main coating of **MasterSeal M 689** shall be applied at a consistent rate by spraying in constant hand speed and at standard crosshatch spray pattern. Applying each layer at perpendicular direction provides more uniformity in its thickness and coverage.
- Each parallel spray stroke should overlap 50% with previous stroke to ensure proper coverage of material.

- The coating thickness per spray application at normal hand speed is approximately 0.5-0.7mm (0.55-0.77 kg/m²).
- Due to the product's fast setting property, the required thickness can normally be built-up at the same time of application by spraying multiple coating layers.
- Full cure is normally achieved within 48 hours.
- 1.1 kg of applied material will approximately cover 1 m² area at 1mm thickness.

4.5 Adhesion promoter application for aged membranes – MasterSeal P 691

- **MasterSeal P691** is a single component polyurethane primer designed as an adhesion promoting primer between old and new layers of **MasterSeal M 689**, or for improved adhesion between system layers on heavily trafficked and critical exposed areas.
- Clean the surface using proper cleaning solvent prior to application, removing any contaminants. Heavily soiled and contaminated areas may require deep cleaning by pressure wash, hand scrub and/or grinding prior to solvent wiping.
- Ensure that the surface is dry and apply **MasterSeal P 691** by brush or roller at a rate of 0.05-0.10 kg/m². **MasterSeal P 691** should be applied in a thin coating layer, applying it too thick may cause the material to foam.
- Allow the primer to dry for at least 1 hour then spray **MasterSeal M 689** immediately. **MasterSeal P 691** will require recoating if spraying is delayed and exceeds 24 hours or less if the primer has noticeably been contaminated.

5 TOPCOAT (If required for colour stability)

- **MasterSeal M 689** pure polyurea is UV resistant but the colour is not stable. **MasterSeal M 689** will discolour due to UV exposure, but the mechanical properties will not be affected.
- Where colour stability is required, the following topcoat options can be used for **MasterSeal M 689**, depending on the requirement.

  MasterSeal TC 256 – Two component elastomeric polyurethane

  MasterSeal TC 257 – Two component hard-wearing polyurethane

  MasterSeal TC 258 – Single component elastomeric polyurethane

- Mix the Part A & B components thoroughly using a slow speed mixing drill until uniform in colour. Single component topcoat also needs to be agitated/stirred to ensure colour uniformity.
- Apply the coating in single coat using roller at a rate of 0.3-0.4 kg/m².
- The coating will become tack-free dry in approximately 2 hours but can only be opened to traffic after 48 hours.

6 REPAIR WORKS

Damages and defects on applied **MasterSeal M 689** coating shall be repaired as follows.

- Cut any loose material from the damaged coating or defect.

- Grind the exposed concrete and edge of the retained existing membrane for overlap. Grinding improves adhesion by creating mechanical key and opens the pores of existing membrane and concrete. Ensure to create featheredging on the retained existing membrane.
- Clean the area using a proper cleaning solvent before priming application.
- Apply **MasterTop P 650** primer onto the exposed concrete and allow to adequately dry.
- Once **MasterTop P 650** is tack-free dry, apply the adhesion promoter primer, **MasterSeal P 691** onto the overlap location of the existing membrane and allow to dry for minimum 1 hour.
- For large repairs, the area can be re-sprayed with **MasterSeal M 689**. Alternatively, for small repairs, **MasterSeal M 860**, hand-applied polyurethane-polyurea hybrid can be applied in minimum two coats using brush or roller.

7 INSPECTION AND QUALITY CONTROL

7.1 General notes

- The applicator is responsible for the initial acceptance of the substrate prior to application. No works should be executed without the applicator's satisfaction.
- The applicator should create an inspection checklist based on the above sequence of application and modified as per the actual site condition and requirements.
- It is advisable to create daily records of material and batch used including application parameters and weather conditions for future reference, especially in case of any possible defects.
- Before starting any spray application, conduct at least 1 m² trial on a plastic sheet or any boards to see if the product is properly setting and to find any discoloration.

7.2 Thickness Measurement

Since **MasterSeal M 689** is a fast-curing material, the common way to check coating thickness while wet is not possible. In this regard, below are the two possible ways of checking and monitoring the thickness of application.

- Destructive test:

  This is ideally done immediately, few minutes after spraying, before the material cures and gain its adhesion strength. This also allows immediate repair on the test location and re-spraying of area if the thickness does not meet the requirement.

  Test is done by cutting a small piece and peeling the coating off at minimum 3 random locations for every completed area. Measure the thickness using a calliper.

- Non-destructive test:

  Alternatively, the thickness can be checked without cutting the cured coating by using a digital thickness gauge. This can be done at minimum 3 random locations for every completed area. However, since the test is non-destructive, increasing the number of tests may be advisable to increase the accuracy of test.

  Testing is done by placing the probe of the testing device directly against the surface of coating then the device automatically reads and shows the thickness of coating on the

display. Actual test process and device setting may vary depending on the brand of device used.

8 MATERIAL STORAGE

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

9 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 regarding 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 personnel, 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) can be worn. When working in less well ventilated and in confined spaces, air fed helmets are to shall be worn by the applicators.
- 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 regarding safety and environmental control measures.