MASTER® BUILDERS SOLUTIONS

MasterSeal 7000 CR

Application Manual

A brand of MBCC GROUP

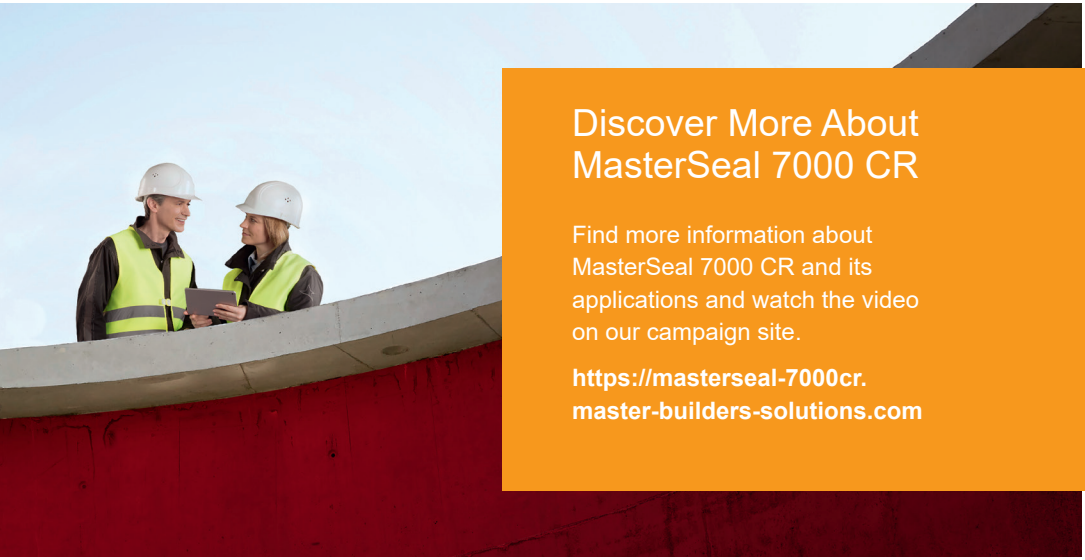
Contents

MasterSeal 7000 CR Application Manual

Protection for harsh conditions

This manual serves as a valuable tool to support the specification of **MasterSeal 7000 CR** by Master Builders Solutions – our protection solution with a unique combination of application and performance properties. Its fast and easy application by rolling or spray, as well as its excellent curing properties allow the efficient, safe and continuous operation of wastewater treatment infrastructures.

High chemical resistance and its ability to bridge cracks of up to 0.7 mm make **MasterSeal 7000 CR** the ideal solution for waterproofing and protecting wastewater treatment concrete structures and sewers.



Discover More About MasterSeal 7000 CR

Find more information about MasterSeal 7000 CR and its applications and watch the video on our campaign site.

https://masterseal-7000cr.master-builders-solutions.com

1. Introduction to MasterSeal 7000 CR

The concrete infrastructure of wastewater treatment systems is subject to complex physical and chemical corrosion processes. Uncoated concrete is particularly susceptible to so-called biogenic sulfuric acid corrosion (BSA) leading to structural concrete damages. The performance-proven **MasterSeal 7000 CR** system significantly extends the life cycle of concrete structures in aggressive wastewater environments.

MasterSeal 7000 CR is used in water-proofing applications that require a high level of chemical resistance, such as:

Fields of application:

- Wastewater treatment plants, in both the in- and outflow areas
- Biogas plants
- Sewage effluent pipelines
- Secondary containment

1.1. Selection of MasterSeal 7000 CR system components

Function	Product	Application conditions					
		Substrate roughness				Application type	
		< 1 mm	1 – 2 mm	2 – 9 mm	> 10 mm	Quick	Normal
Repair mortar	MasterEmaco S 488 PM				●●		●●
Fairing Coat	MasterEmaco N 907	●	●●	●●			●●
Primer	MasterSeal P 770	●●	●			●●	●●
Membrane	MasterSeal M 790	●●	●●	●●	●●	●●	●●

2. Primer

MasterSeal P 770 is the principal primer designed for the **MasterSeal 7000 CR** system.

2.1. MasterSeal P 770: the chemical-resistant primer

MasterSeal P 770 is a two-component primer consisting of an inorganic polyurea composite that provides high substrate penetration on mineral surfaces and promotes bonding of subsequent coatings. The primer layer improves adhesion and prevents the appearance of pinholes or bubbles in hardened overlaid coatings.

Primer	Applications	kg/m²
MasterSeal P 770	Smooth substrates	0.25
	Rough substrates (1–2 mm)	0.25-0.40
	Damp concrete	0.25

3. Membranes

3.1. MasterSeal M 790

MasterSeal M 790 is a two-component crack-bridging membrane consisting of an inorganic polyurea composite that provides high chemical and mechanical resistance. **MasterSeal M 790** can be applied to:

- Horizontal and vertical substrates
- Internal and external areas
- Cementitious concrete mortar or steel substrates
- Reinforced concrete for protection against carbonation and chloride-induced corrosion as well as chemical attack in secondary containment bunds in the chemical and petrochemical industries

MasterSeal M 790 has proven resistance to biogenic sulfuric acid corrosion over the long term (Fraunhofer Institute, Germany). In addition, it is CE-certified according to EN 1504-2 and meets the EN 13529 standard for chemical resistance.

Features and benefits:

- **Easy hand application** by roller
- **Continuous monolithic membrane** – no overlaps, welds, or seams
- **Excellent chemical resistance,** including high concentrations of biogenic sulfuric acid
- **Waterproof** and resistant to standing water
- **Bonds fully to substrates** – can be applied to a wide range of surfaces with the appropriate primer
- **Moisture-tolerant** – can be applied on substrates with high residual humidity
- **High resistance to carbon dioxide diffusion** – protects concrete from rebar corrosion
- **High tear, abrasion, and impact resistance** – can be used in high traffic and other areas exposed to mechanical damage
- **Tough but flexible and crack-bridging**
- **Highly durable and protective** – reduces cracking caused by embrittlement
- **Thermoset** – does not soften at high temperatures
- **Excellent adhesion** to different substrates (concrete and steel)
- **Weatherproof** – proven resistance to thundershowers and freeze-thaw cycles and can be applied to external surfaces without an additional top coat
- **Does not contain solvents**
- **Can be spray-applied** with selected two-component spray machines

CE

1119	
Master Builder Solutions Deutschland GmbH Donnerschweer Str. 372, D-26123 Oldenburg	
16	
700001	
EN 1504-2:2004	
Surface protection product / coating EN 1504-2: Principles 1.3 / 2.2 / 5.1 / 6.1 / 8.2	
Abrasion resistance	≤ 3000 mg
Permeability to CO_2	SD > 50
Permeability to water vapour	Class III
Capillary absorption and permeability to water	< 0.1 kg/(m^2x$h^{0.5}$)
Thermal compatibility after freeze-thaw cycling	≥ 1.5 N/mm^2 Pass
Resistance to severe chemical attack Class I: 4a, 6a, 9a, 13, 15 Class III: 1, 2, 3, 4, 5, 5a, 6, 7, 9, 10, 11, 12, 14, 15a	Reduction of hardness < 50 %
Crack bridging ability	A3 (23˚C) A2 (–10˚C) B3.1 (23˚C) B2 (–10˚C)
Impact resistance	Class III
Adhesion strength by pull-off test	≥ 1.5 N/mm^2
Reaction to fire	Class E
Dangerous substances	Comply with 5.3 (EN 1504-2)

NPD = No performance determined. Performance determined in system build up MasterSeal 7000 CR.

4. Types of Substrates

MasterSeal 7000 CR can be applied to:

- Concrete – even damp or subject to rising damp
- Cementitious mortars
- Old epoxy or polyurethane coatings – once properly cleaned, degreased, and roughened

5. Preparation of the Substrate

All substrates – whether new or old – must be structurally sound, touch-dry, free of laitance and loose particles, and clean of oil, grease, rubber skid marks, paint stains, and other adhesion-impairing contaminants.

Concrete surfaces should be shot blasted, sprayed with a high-pressure water jet, or prepared with some other suitable mechanical cleaning method. Hardness and durability of the concrete are very important parameters for the preparation of the substrate. Damaged substrates or uneven surfaces with indentations deeper than 5 mm must be repaired and leveled by using structural repair mortars, such as **MasterEmaco S 488 PM**. Very rough or irregular substrates with indentations to a depth of up to 5 mm should also be leveled before application with a suitable repair mortar, such as **MasterEmaco N 907**.

To avoid rigid corners and possible failures, form a coving using a round-nosed trowel with a minimum radius of 20 mm at both vertical and horizontal corners and edges. **MasterEmaco S 488 PM** is a suitable repair mortar for coving application, while **MasterSeal 590** is preferred for fast applications.

Cementitious substrates can even be saturated with water as long as the surface stays dry during application. There is no limitation on the age of the substrate as long as it has minimum pull off strength of 1.5 N/mm² prior to primer application. Substrate temperature must be a minimum of 5 ºC and maximum of 40 ºC.

6. Temperature for the Application

Application can only take place when the ambient temperature is between 5 °C and 40 °C. It is recommended that the products be pre-conditioned at around 25ºC for at least 24 hours prior to application.

7. MasterSeal 7000 CR System Buildup

Below are the basic guidelines for the **MasterSeal P 770** primer as well as the **MasterSeal M 790** membrane. Standard consumption for each system is also indicated.

Function	Product	Application	Consum
Repair	MasterEmaco S 488 PM	Repair and leveling (10–50 mm)	2.2 kg/m²/mm
	MasterSeal 590	Fast formation of covings	0.75–1 kg/m² (for 20 mm radius)
	MasterEmaco N 907	Fairing coat (1–9 mm)	1.7 kg/m²/mm
Primer	MasterSeal P 770	Porous substrates– 2 layers application	0.3 kg/m²
		Dense substrates	0.2 kg/m²
Membrane	MasterSeal M 790	Wastewater treatment	0.8–1.2 kg/m²

8. Hand Application

8.1. Safety tools

The usual safety measures for handling chemical products should be observed when using **MasterSeal 7000 CR** system components. For example, do not eat, smoke, or drink while working, and wash hands when taking a break and once the job is completed.

Specific safety information on the handling and transportation of the products described in this manual can be found in the material safety data sheet of the individual product. Disposal of products and their containers should be carried out according to current local legislation. Safety glasses, gloves, and shoes, as well as respirators and clothes that properly protect the body from chemical contact are mandatory when handling and applying the products. In addition to safety gear, all necessary safety tools must be used when requested by the owner of the jobsite.

8.2. Equipment

- Handheld electric mixer
- Mixing paddle with two turbine blades fitted one above the other, such as the Collomix DLX 90 S or alternatively the Collomix FM 60 S or 80 S models
- Roller frames in different sizes
- Shed-resistant roller skin cover with high-density white fabric (5–6 mm thick)
- Sash paint brushes in different sizes
- Polypropylene bucket (min. 10 L)
- Roller tray
- Masking tape

Collomix DLX

Collomix FM

8.3. Primer application

8.3.1. Material preparation

MasterSeal P 770 is supplied in the exact mixing ratio in prepacked working kits. For optimum performance, it is recommended that products be preconditioned at around 20 ºC at least 24 hours before application. Pour the entire contents of Part A into Part B's container and mix with the recommended handheld electric mixer at a low speed (max. 400 rpm) for at least 90 seconds. Scrape the sides and the bottom of the container several times to ensure thorough mixing. Keep the mixer blades submerged in the coating to avoid introducing air bubble. **Do not mix part packs and do not mix by hand!**

8.3.2. Roller application

MasterSeal P 770 can only be applied at an ambient and substrate temperature of between 5 ºC and 40 °C. To fully cure, the material, substrate, and ambient temperature should not fall below the minimum recommendation.

Quickly and constantly apply the freshly mixed primer on the prepared surfaces in up and down strokes with the recommended roller. Push the roller with enough pressure to wet the substrate, while scanning the surfaces for any unprimed patches. Beware that the pot life of **MasterSeal P 770** is relatively short – 10 minutes at 30 °C. Take this into consideration when mixing the amount of material needed on site.

The consumption of **MasterSeal P 770** varies according to the porosity of cementitious surfaces. Although 0.2 kg/m^2 of mixed material is enough to prime dense substrates, more material (approx. 0.3 kg/m^2) is required to treat porous substrates and should be applied in at least two layers. This helps to successfully seal the pores. It should be noted that a well-treated substrate is essential for the successful coating application.

8.3.3. Curing

MasterSeal P 770 dries as an intense transparent film within 5 hours at 20 °C. The chemical reactions are slowed down at low temperatures, which correspondingly extends the curing period: the intense transparent film cures within 11 hours at 5 °C.

8.4. Membrane application

8.4.1. Material preparation

MasterSeal M 790 is supplied in the exact mixing ratio in prepacked working kits. For optimum performance, it is recommended that products be preconditioned at around 25 ºC at least 24 hours before application. Pour the entire contents of Part A into Part B's container and mix with the recommended handheld electric mixer at a low speed (max. 400 rpm) for at least 90 seconds. Scrape the sides and the bottom of the container several times to ensure thorough mixing. Keep the mixer blades submerged in the coating to avoid introducing air bubbles. **Do not mix part packs and do not mix by hand!**

8.4.2. Roller application

MasterSeal M 790 should be applied no sooner than at least 5 hours (at 20 °C) after the application of **MasterSeal P 770**.

Pour the freshly mixed **MasterSeal M 790** into the clean, dry polypropylene bucket and place the roller tray into the bucket. Select the correct size of the roller frame and roller skin as recommended in the equipment section and begin applying the membrane to the primed surface quickly and constantly in up and down strokes. Use a brush or small roller to apply the material to hidden corners, edges, and other difficult-to-reach areas on the surface.

It is recommended that **MasterSeal M 790** be applied in at least two layers. Apply 0.4 kg/m^2 for each layer and wait a minimum of 8 hours (overnight) with an ambient and substrate temperature of at least 20 ºC before applying the second layer. A total of 0.8 kg/m^2 of fresh material applied to the surface is adequate to provide sufficient chemical resistance.

8.4.3. Curing

MasterSeal M 790 dries as an intense solid film within 8 hours at 20 °C. The chemical reactions slow down at low temperatures, which correspondingly extends the curing period. The treated substrate can come into contact with water 24 hours after application at 20 °C.

8.5. Cleaning tools

Tools can be cleaned while wet with solvent-based cleaners, such as M.E.K (Methyl Ethyl Ketone). Once cured, the material can only be removed mechanically.

9. Spray Application

9.1. Safety tools

The usual preventive measures for handling chemical products should be observed when using MasterSeal 7000 CR system components. For example, do not eat, smoke, or drink while working, and wash hands when taking a break and once the job is completed.

Specific safety information on the handling and transportation of the products described in this manual can be found in the material safety data sheet of the individual product. Disposal of products and their containers should be carried out according to current local legislation. Safety glasses, gloves, and shoes, as well as respirators and clothes that properly protect the body from chemical contact are mandatory when handling and applying the products. The spray operator must wear a powered air purifying respirator during application. In addition to safety gear, all necessary safety tools must be used when requested by the owner of the jobsite.

9.2. Equipment

MasterSeal 7000 CR system can be spray applied using specific high-pressure, plural-component spray equipment that enables the correct mixing ratios of **MasterSeal P 770** and **MasterSeal M 790** during application.
It is therefore recommended that the Graco XM 70 high-pressure, two-component sprayer be used for the application of the **MasterSeal 7000 CR** system (please see the Graco XM 70 illustrated on page 14).

- Handheld electric mixer
- Mixing paddle with two turbine blades fitted one above the other, such as Collomix DLX 120 or DLX 152
- Masking tape

9.3. Primer application

9.3.1. Material preparation

MasterSeal P 770 is supplied in the exact mixing ratio in prepacked working kits.
For optimum performance, it is recommended that products be preconditioned at around 25 °C at least 24 hours before application
Pour the required number of Part A cans into a big, clean container and stir with the recommended handheld electric mixer and mixing paddle (e.g. DLX 120) at a low speed (max. 400 rpm) for at least 1 minute. Keep the mixer blades submerged in the material to avoid air entrainment. Pour the stirred Part A material into Tank B of the Graco XM spray equipment until full. Pour the same number of Part B cans directly into Tank A of the spray equipment without stirring. Because of the unusual mixing ratio of **MasterSeal P 770** – more hardener is needed than base component – parts A and B must be poured into the spray equipment tanks crosswise! Do not stir Part B!

Intuitive user controls

- Adjustable ratio control, 1:1 to 10:1
- Provides real-time display of ratio for ultimate spraying control
- Two displays modes: “set-up” for entering parameters and “run” mode for everyday operation
- The interface tracks pressure, temperature and flow
- USB drive for data reporting

Precise mixing and ratio assurance

- Provides precision mixing and accurate ratio control, even at high flow rates
- Advance sensors allow pumps to compensate for pressure fluctuations, resulting in accurate on-ratio mixing
- Choose standard or remote mount

Heavy-duty

- Carbon Steel Frame
- Built-in pallet rack for easy transport

Material Hoppers

- Side or rear-mount
- 76 liter capacity

Fluid heaters

spray equipment without stirring. Because

9.3.2. Equipment setup

- Graco XM is a high-pressure, plural-component sprayer that runs on electricity and highly pressurized air. Before installing the pump on site, check the Graco XM operations manual for the air supply's power cord requirements
- Make sure that there is no leftover material from previous applications in the pump
- Turn on the main power disconnect. The fluid-control screen will display after 5 seconds
- Adjust the mixing ratio with the optional setup selections displayed on the monitor. The mixing ratio for **MasterSeal P 770** for parts B:A is 1.16:1 by volume. Enter this value in the system settings for the mixing ratio. Note that this value refers to A:B on the pump's display! Set the tolerance for the mixing ratio to 5 %. The pump will stop when this tolerance is exceeded during application. This is very important for the precision of the automatic mixing and quality of the mixed material.
- Relieve the system pressure, then flush and prime the system. **See the Graco XM operations manual**
- View alarms and clear them accordingly
- Recirculate the components filled in tanks A and B to ensure that any settled fillers are properly mixed in, the pump lines are fully primed, and the pump check valves are operating smoothly
  See the Graco XM operations manual
- In case heating is required, only heat Part A in Tank B up to 25 °C (ask your local Master Builders Solutions expert for help with higher temperatures)
  Open the heater and start recirculating Tank B until the thermometer and display reach operating temperature
- The machine will be ready for application after recirculating both components for 5 to 10 minutes

9.3.3. Spray application

- Close the recirculation and mix manifold flush valves. Open the mix manifold valves A (blue) and B (green)
- Adjust the pump air regulator to 30 psi (2.1 bar)
- Select the spray logo  on the main display and press 
- Disengage the trigger lock and activate the gun into a grounded metal pail through a hole in its lid to avoid splashing. Run the solvent through the mix hose until a well-mixed coating flows from the gun
- Engage the trigger lock. Install a 0.015-inch (0.38-milimeter for the XHD 515) tip on the gun
- Adjust the air regulator (CD) to between 4,000 and 4,200 PSI (276 to 290 bars) and apply the coating to a test panel. Check the ratio screen to make sure that it is reading the correct ratio and the bar graph to make sure that the mix manifold restriction adjustment is within optimal range. **See the Graco XM operations manual**
- Keep the gun 50 to 80 cm away from the surface when starting to spray
- Spray the surface from right to left in slow

movements at a 90-degree angle to ensure an even film thickness across the substrate
- Try to achieve a wet film thickness of 0.2 to 0.3 mm on the surface
- Flush the mixed material immediately after finishing the application. Since **MasterSeal P 770** has a relatively short pot life, it is highly recommended that the mixed material be flushed before breaks of more than 10 minutes. Use M.E.K (Methyl Ethyl Ketone) to flush the mixed material.

9.3.4. Curing

MasterSeal P 770 dries as an intense transparent film within 5 hours at 20 °C. The chemical reactions slow down at low temperatures, which correspondingly extends the curing period: it forms the intense transparent film within 11 hours at 5 °C.

9.4. Membrane application

9.4.1. Material preparation

MasterSeal M 790 is supplied in the exact mixing ratio in prepacked working kits. For optimum performance, it is recommended that products be preconditioned at around 25ºC at least 24 hours before application. The big kit (9 kg Part A and 21 kg Part B) is designed and recommended for spray application. Stir Part A in its original container with the recommended handheld electric mixer and mixing paddle (e.g. DLX 120) at a low speed (max. 400 rpm) for at least 1 minute. Keep the mixer blades submerged in the material to avoid air entrainment. Pour the stirred Part A into Tank B of the Graco XM spray equipment until full. Open Part B's container and pour it directly into Tank A of the spray equipment without stirring. Each Graco XM tank can hold 76 liters. Both tanks can be filled with three containers of **MasterSeal M 790** Part A (27 kg) and Part B (63 kg).

Because of the unusual mixing ratio of **MasterSeal M 790** – more hardener is needed than base component – **parts A and B must be poured into the spray equipment tanks crosswise! Do not stir Part B!**

9.4.2. Equipment setup

Graco XM is high-pressure, plural-component sprayer that runs on electricity and highly pressurized air. Before installing the pump on site, check the XM operations manual for the air supply's power cord requirements.
Be sure that there is no leftover material from previous applications in the pump!

- Turn on the main power disconnect. The fluid-control screen will display after 5 seconds
- Adjust the mixing ratio with the optional setup selections displayed on the monitor. The mixing ratio for **MasterSeal M 790** for parts B:A is 2.60:1 by volume. Enter this value in the system settings for the mixing ratio. Note that this value refers to A:B on the pump's display! Set the tolerance for the mixing ratio to 5%. The pump will stop when this tolerance is exceeded during the application.
- Relieve the system pressure, then flush and prime the system. **See the Graco XM operations manual**
- View alarms and clear them accordingly
- Recirculate the components filled in tanks A and B to ensure that any settled fillers are properly mixed in, the pump lines are fully primed, and the pump check valves are operating smoothly **See the Graco XM operations manual**
- In case heating is required, only heat Part A in Tank B up to 32 °C. (ask your local Master Builders Solutions expert for help with higher temperatures)
  Open the heater and start recirculating Tank B until the thermometer and display reach operating temperature
- The machine will be ready for application after recirculating both components for 5 to 10 minutes

9.4.3. Spray application

- Close the recirculation and mix manifold flush valves. Open the mix manifold valves A (blue) and B (green)
- Adjust the pump air regulator to 30 psi (2.1 bar)
- Select the spray logo  on the main display and press 
- Disengage the trigger lock and activate the gun into a grounded metal pail through a hole in its lid to avoid splashing. Run the solvent through the mix hose until a well-mixed coating flows from the gun
- Engage the trigger lock. Install 0.033-inch (0.84-milimeter for the XHD 433) tip on the gun
- Adjust the air regulator (CD) to between 4,000 and 4,500 PSI (276 to 310 bars) and apply the coating to a test panel. Check the ratio screen to make sure that it is reading the correct ratio and the bar graph to make sure the mix manifold restriction adjustment is within optimal range. **See the Graco XM operations manual**
- Keep the gun 70 to 100 cm away from the

surface when starting to spray. Do not spray the material too close to surface (less than 50 cm), as sagging might occur before the recommended thickness is achieved
- Spray the surface from right to left in slow movements at a 90-degree angle to ensure an even film thickness across the substrate
- Try to achieve a wet film thickness of 0.8 to 1.2 mm on the surface in a single layer
- Flush the mixed material immediately after finishing the application. Since **MasterSeal M 790** has relatively short pot life, it is highly recommended that the mixed material be flushed before breaks of more than 10 minutes. Use M.E.K (Methyl Ethyl Ketone) to flush the mixed material

9.4.4. Curing

MasterSeal M 790 dries as an intense solid film within 8 hours at 20 °C (25 hours at 5 °C). The chemical reactions slow down at low temperatures, which correspondingly extends the curing period. The treated substrate can come into contact with water 24 hours after application at 20 °C.

9.5. Cleaning the pump

Part A of both **MasterSeal P 770** and **MasterSeal M 790** can easily be cleaned with water. Carefully wash out Tank B of the Graco XM sprayer with water. Part B of both products can be cleaned with proper solvents, such as M.E.K (Methyl Ethyl Ketone). Wash out Tank A with M.E.K (Methyl Ethyl Ketone).

See the Graco XM cleaning procedure provided in the operations manual.

10. Chemical Resistance Overview

Chemical resistance (according EN 13529)			
Group	**Description**	**Test Liquid**	**Result***
DF 1	Gasoline	Toluene (47.5 %) + isooctane (30.4 %) + n-heptane (17.1 %) + methanol (3 %) + 2-methyl-propanol-(2) (2 %)	Class III (8 %)
DF 2	Aviation fuels	Toluene (50 %) + isooctane (50 %) Aviation fuel 100 LL (NATO Code F-18) Turbo fuel A1 (NATO Code F-34/35)	Class III (9 %)
DF 3	Fuel oil, diesel fuel, and other unused combustion motor oils	n-Paraffin (C12 to C18) (80 %) + methylnaphthalene (20 %)	Class III (8 %)
DF 4	All hydrocarbons as well as mixtures containing a benzene vol. of max. 5 %	Toluene (60 %) + xylene (30 %) + methylnaphthalene (10 %)	Class III (19 %)
DF 4a	Benzene and benzene-containing mixtures (incl. 4)	Benzene (30 %) + toluene (30 %) + xylene (30 %) + methylnaphthalene (10 %)	Class III (25 %)**
DF 5	Mono- and polyvalent alcohols (with a methanol vol. of max. 48 %) and glycol ethers	Methanol (48 %) + IPA (48 %) + water (4 %)	Class III (35 %)
DF 5a	All alcohols and glycol ethers (incl. 5 and 5b)	Methanol	Class III (48 %)
DF 6	Halogen hydrocarbons ≥ C2 (incl. 6b)	Trichloroethylene	Class III (18 %)
DF 6a	All halogen hydrocarbons (incl. 6 and 6b)	Dichloromethane (methylene chloride)	Class I
DF 6b	Aromatic halogen hydrocarbons	Monochlorobenzene	Class III (20 %)
DF 7	All organic esters and ketones (incl. 7a)	Ethyl acetate (50 %) + methyl isobutyl ketone (50 %)	Class II (43 %)
DF 9	Aqueous solutions with organic (carboxylic) acids up to 10 % as well their salts	Aqueous acetic acid (10 %)	Class III (8 %)**
DF 9a	Organic (carboxylic but not formic) acids as well as their salts	Acetic acid (50 %) + propionic acid (50 %)	Class I
DF 10	Mineral (non-oxidizing) acids up to 20 % and inorganic salts in aqueous solution (pH < 6), except HF	Sulfuric acid (20 %)	Class III (10 %)
DF 11	Inorganic (except oxidizing) lye and inorganic salts in aqueous solution (pH > 8)	Sodium hydroxide solution (20 %)	Class III (11 %)
DF 12	Aqueous solutions of inorganic, non-oxidizing salts (pH 6–8)	Aqueous sodium chloride solution (20 %)	Class III (13 %)
DF 13	Amines in aqueous solutions as well as their salts	Triethanolamine (35 %) + n-butylamine (30 %) + N,N-dimethylaniline (35 %)	Class I
DF 14	Aqueous solutions of organic surfactants	1) Protectol KLC 50 (3 %) + Marlophen NP 9,5 (2 %) + water (95 %) 2) Texapon N 28 (3 %) + Marlipal O 13/80 (2 %) + water (95 %)	Class III (10 %)
DF 15	Cyclic and acyclic ethers (including 15a)	Tetrahydrofuran (THF	Class I
DF 15a	Non-cyclic ethers	Diethyl ether	Class III (19 %)

Class I: 3d without pressure
Class II: 28d without pressure
Class III: 28d without pressure

Reduction in hardness of less than 50 % when measured according to Buchholz method (EN ISO 2815) or Shore method (EN ISO 868) 24 hours after the coating is removed from immersion in the test liquid.

* Values in brackets are reduction of shore A hardness / ** Colour change

Chemical resistance			
Media	**Temperature (°C)**	**Duration of impact (hours)**	**Resistance***
Acids			
Sulphuric acid (20 %) (DF 10 acc. to EN 13529)	20	170	++
Sulphuric acid (50 %)	50	170	++
Acetic acid (10 %) (DF 9 acc. to EN 13529)	20	310	++
Acetic acid (20 %)	20	310	++
Lactic acid (30 %)	20	170	++
Sulphuric acid (20 %) + lactic acid (5 %)	50	170	++
Lye			
Sodium hydroxide (20 %) (DF 11 acc. to EN 13529)	20	310	++
Potassium hydroxide (20 %)	20	310	+
Ammonia (25 %)	20	310	–
Organic chemicals			
Ethanol (50 %)	20	310	o
(48 %) Methanol + (48 %) Isopropanol + (4 %) Water (DF 5)	20	500	o
Methanol (100 %) (DF 5a acc. to EN 13529)	20	500	o
50 % Ethyl acetate + 50 % methylisobutylketone (DF 7)	20	500	–
Toluene	20	500	o
Gasoline (according to EN 228 and DIN 51626-1)	20	500	++
Specific solutions			
Silage water (milk [3 %] + vinegar [1.5 %] + butyric acid [0.5 %])	40	500	++
Liquid manure (ammonium hydrogen phosphate [7 %])	40	500	++
Distilled water	40	500	++
Chlorine bleaching	50	170	++
Chlorinated water	20	500	++

* Tensile strength development in comparison to untreated sample:

++	100 – 80 %	→ Resistant without any changes
+	79 – 55 %	→ Medium resistance
o	54 – 45 %	→ Short-term resistance (occasional contact or splashing mode)
–	< 45 %	→ Not resistant

Master Builders Solutions

The Master Builders Solutions brand brings all of our expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry. The know-how and experience of a global community of construction experts form the core of Master Builders Solutions.

We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, solutions for underground construction, waterproofing solutions, sealants, concrete repair & protection solutions, performance grouts, performance flooring solutions and solutions for on- and offshore wind energy.

Our comprehensive portfolio

- Concrete admixtures
- Cement additives
- Chemical solutions for underground construction
- Waterproofing solutions
- Sealants
- Concrete repair and protection solutions
- Performance grouts
- Wind turbine grouts
- Performance flooring solutions

Master Builders Solutions for the Construction Industry

MasterAir®
Complete Solutions for air entrained concrete

MasterBrace®
Solutions for strengthening and structural adhesives

MasterCast®
Solutions for the manufactured concrete product industry

MasterCell®
Density reducing admixtures

MasterCem®
Solutions for cement manufacture

MasterEase®
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Hyperplasticizer formulated from state-of-the-art polymers for the ultimate performance

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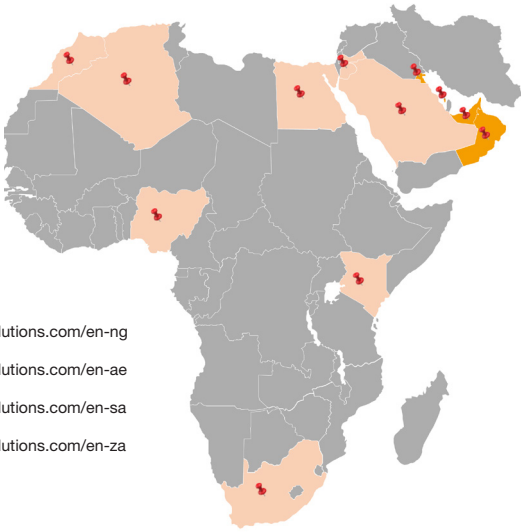

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