

MasterSeal M 790

Two-component highly chemical resistant, crack-bridging membrane based on Xolutec Technology for waterproofing and protection of concrete structures in harsh conditions

MATERIAL DESCRIPTION

MasterSeal M 790 is a two-component crack bridging membrane based on Xolutec Technology providing high chemical and mechanical resistance.

Xolutec a new dimension in durability Xolutec is an innovative and smart way of combining complementary chemistries. When the material is mixed on site a cross-linked interpenetrating network (XPN) is formed enhancing the overall material properties. By controlling the cross-linking density, the properties of Xolutec can be adjusted depending on the product performance required, e.g. this allows the formulation of materials with varying degrees of toughness and flexibility. Xolutec is very low in volatile organic components (VOC), is quick and easy to apply with both spray and hand application depending on requirements. It cures rapidly even at low temperature, reducing application time thus enabling fast return to service and minimizing downtime.

This technology tolerates a wide variety of different site conditions, greatly expanding the application window and reducing the potential for delays and failures. Long maintenance cycles and lower life cycle costs significantly reduce total cost of ownership.

FIELDS OF APPLICATION

MasterSeal M 790 is used in waterproofing applications where a high level of chemical resistance is required.

- Waste-water treatment plants both in the inflow and outflow areas.
- Sewage effluent pipelines.
- Biogas plants.
- Secondary containment.

MasterSeal M 790 can be applied on:

- Horizontal and vertical substrates.
- Internal and external areas also with rubber wheel traffic.
- Concrete, cementitious mortar or steel substrates.
- Reinforced concrete to protect it against carbonation or chloride induced corrosion and for protection against chemical attack in secondary containment bunds in chemical and petrochemical industries.

Contact your local Master Builders Solutions representative for any other applications.

FEATURES AND BENEFITS

- Easy hand application by roller or trowel.
- Continuous membrane: monolithic – no laps, welds or seams.
- Excellent chemical resistance – including high concentrations of biogenic sulphuric acid.
- Waterproof and resistant to standing water.
- Fully bonded to substrate: can be applied to a wide range of substrates with the appropriate primer.
- Moisture tolerant.
- High resistance to carbon dioxide diffusion: Protects concrete from rebar corrosion.
- High tear, abrasion and impact resistance: Withstands traffic and use in areas exposed to mechanical damages.
- Tough but flexible and crack bridging.
- Thermoset: does not soften at high temperatures.
- Excellent adhesion.
- Weatherproof: proven thundershower and freeze / thaw resistance, can be applied outdoors without additional top coating.
- Does not contain solvents.
- Can be spray-applied with selected 2- component spray machines (please contact our technical service for details).

APPROVALS AND CERTIFICATES

- Proven long-term resistance to biogenic sulfuric acid corrosion resistance (Fraunhofer Institute).
- CE Certification according to EN 1504-2.
- Chemical Resistance according to EN 13529.

PACKAGING

MasterSeal M 790 is available as:

Hand application:

5kg kits consisting of 1.5kg Part A & 3.5kg Part B

Spray application:

30kg kits consisting of 9kg Part A & 21kg Part B.

COLOUR

Grey and Red

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APPLICATION PROCEDURE

Surface Preparation:

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

Concrete:

The surface should be prepared by shot blasting, high-pressure water jetting or other suitable mechanical method. After preparation, concrete and other cementitious substrates must have a minimum pull off strength of 1 N/mm².

Wall/Floor connections must be rounded by using suitable products e.g. **MasterSeal 590**.

For maximum application performance substrate temperature must be minimum +5°C and maximum +40°C. The temperature of the contact surfaces must be at least 3°C above the ambient dew point temperature. For higher temperatures consult Master Builders Solutions Technical Services department.

Primer Coat:

A primer coat will improve the adhesion and prevent the appearance of pinholes or bubbles in the hardened coating. The recommended primer for **MasterSeal M 790** is **MasterSeal P 770***. The substrate should be visibly dry. The temperature of the contact surfaces must be at least 3°C above the ambient dew point temperature.

MasterSeal P 770 can be applied by roller in one layer and its consumption is approx. 0.25- 0.4kg/m².

Wait for at least 5 hours (@ 20°C) before applying **MasterSeal M 790**.

* Please refer to relevant product data sheet for details.

Mixing:

MasterSeal M 790 is supplied in working kits which are pre-packaged in the exact mixing ratio.

Pour the entire content of Part A into the container of Part B and mix with a mechanical drill and paddle at low speed (max. 400 rpm) for at least 3 minutes. Scrape the sides and the bottom of the container several times to ensure complete mixing. Keep the mixer blades submerged in the coating to avoid introducing air bubbles.

Do not mix part kits and do not mix by hand!

Hand Application (substrate temperature from +5°C to +30°C):

MasterSeal M 790 can be applied by brush or roller. It is always recommended to complete the application in a minimum of two layers. Minimum waiting time before application of second coat is 8 hours (overnight) at 20°C ambient and substrate temperature and the maximum time is 48 hours.

Spray application (substrate temperature above +30°C):

MasterSeal M 790 is sprayed with Graco XM70 Plural component sprayer. For detailed application methodology kindly refer to the **MasterSeal 7000CR** Application Manual or consult master Builders Solutions Technical Services Dept.

COVERAGE

The consumption of **MasterSeal M 790** is approximately 0.4 kg/m² per coat. A minimum of two coats is required, depending on the condition and porosity of the substrate and requested film thickness. A two-coat application with a total consumption of approximately 0.8kg/m² will provide a dry film thickness of approx. 0.6mm. In high chemically demanding environments (e.g. waste water treatment plants) and/or in harsh, abrasive conditions, a dry film thickness of 0.9mm is recommended. Therefore, a minimum consumption of 1.0-1.2 kg/m² in two or three layers must be applied.

These consumptions are theoretical and can vary according to the absorption and roughness of the substrate. It is essential to carry out representative trials on site to evaluate the exact consumption.

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FINISHING AND CLEANING

Tools can be cleaned with a suitable Xylene thinner while still wet. Once cured, the material can only be removed mechanically.

WORKING TIME

Approximately 20 minutes at 20°C ambient and substrate temperature.

STORAGE AND SHELF LIFE

MasterSeal M 790 should be stored in original containers under dry conditions at temperatures between 10-25°C preferably. Protect from frost and no permanent storage over +30°C. Shelf life under these conditions is 12 months for both parts.

WATCH POINTS

- For maximum application performance do not apply at temperatures below +5°C nor above +40°C. For higher temperatures consult Master Builders Solutions Technical Services department.
- Do not add any solvents, sand or other components to **MasterSeal M 790** mixes.
- Ensure application in a continuous layer avoiding pinholes, or surface defects that can facilitate penetration of chemicals to substrate.
- Under strong UV radiation the hardened membrane can yellow; this has however no influence on the chemical resistance and mechanical performance of the material.

HANDLING AND PRECAUTIONS

Usual preventive measures for the handling of chemical products should be observed when using this product, for example do not eat, smoke or drink while working and wash hands when taking a break or when the job is completed.

Specific safety information referring the handling and transport of this product can be found in the Material Safety Data Sheet. Disposal of product and its container should be carried out according to the local legislation in force. Responsibility for this lies with the final owner of the product.

NOTE

Technical support, where provided, does not constitute supervisory responsibility. For additional information contact your local MB Construction Chemicals Solutions South Africa (Pty) Ltd representative. MB Construction Chemicals Solutions South Africa (Pty) Ltd shall not be liable for technical advice provided.

MB Construction Chemicals Solutions South Africa (Pty) Ltd reserves the right to have the true cause of any difficulty determined by accepted test methods. Undertaking such tests is not, and shall not be deemed to be, an admission of liability or an assumption of any risk, loss, damage or liability.

QUALITY AND RESPONSIBLE CARE

All products originating from MB Construction Chemicals Solutions South Africa (Pty) Ltd are manufactured under a management system independently certified to conform to the requirements of the quality standards ISO 9001, environmental and occupational health and safety standards.

* Properties listed are based on laboratory controlled tests.

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TECHNICAL DATA*

Property	Standard	Data	Unit
Density of mixed material	EN ISO 2811-1	approx. 1.2	g/cm ³
Viscosity of mixed material	EN ISO 3219	approx. 2800	mPas
Application temperature (substrate)	-	from +5 to +40	°C
Pot-life	at +10°C at +20°C at +30°C	approx. 25 approx. 20 approx. 15	minutes
Re-coating interval	at +5°C at +20°C at +30°C	approx. 24 approx. 8 approx. 4	hours
Fully cured after	at +20°C	7	days
Exposure to water pressure after	at +20°C	24	hours
Service temperature (dry)	-	-20 to +80	°C
Service temperature (wet)	-	up to +60	°C
Adhesion to concrete (dry) after 28 days	EN 1542	2.9	N/mm ²
Adhesion to concrete (wet) after 28 days	EN 13578	2.2	N/mm ²
Adhesion strength after freeze-thaw cycles	EN 13687-1	2.7	N/mm ²
CO ₂ permeability S _D	EN 1062-6	206 (required >50)	m
Water vapour permeability S _D	EN ISO 7783	126 (class III SD >50)	m
Capillary water absorption	EN 1062-3	0.0005 (required <0.1)	kg/m ² .h ^{0.5}
Behaviour after artificial weathering (2000 h)	EN 1062-11	no blistering, cracking or flaking; colour change	-
Tensile strength	EN ISO 527-1/-2	>20	N/mm ²
Abrasion resistance - Taber test (mass loss)	EN ISO 5470-1	194 (required < 3000)	mg
Abrasion resistance - BCA test (thickness loss)	EN 13894-2	< 10 (= class AR 0.5)	µm
Dynamic friction (test for rubber wheel traffic)	20,000 cycles dry 20,000 cycles wet "Stuttgarter Gerät"	no abrasion of material no abrasion of material	-
Impact resistance	EN ISO 6272/2	24.5 (class III > 20)	Nm
Shore D hardness after 7 days	EN ISO 868/07	80	-
Reaction to Fire	EN 13501-1	Class E	-
Static crack bridging	EN 1062-7	A3 (+23°C)	Class
Dynamic crack bridging	EN 1062-7	B3.1 (+23°C)	Class
Elongation at break	DIN 53504	20	%
Resistance to positive water pressure	UNE-EN 12390-8	5	bar
Resistance to negative water pressure	based on UNI 8298-8	2.5	bar

Note: Data are measured at 21°C ± 2°C and 60% ± 10% relative humidity if not stated differently. Higher temperatures and/or higher relative humidity can shorten hardening/curing times, and vice versa. Technical data shown are statistical results and do not correspond to guaranteed minima. Tolerances are those described in appropriate performance.

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CHEMICAL RESISTANCE (ACCORDING EN 13529)

Group	Description	Test Liquid	Result*
DF 1	Gasoline	47.5% toluene + 30.4% isooctane + 17.1% nheptane + 3% methanol + 2% 2-methylpropanol-(2)	Class III (8%)
DF 2	Aviation fuels	50% toluene + 50% isooctane Aviation fuel 100 LL NATO code F18 Turbo fuel A1 NATO Code F34/F35	Class III (9%)
DF 3	Fuel oil, Diesel fuel and other unused combustion motor oils	80 % n-paraffin (C12 to C18) + 20 % methyl-naphthalene	Class III (8%)
DF 4	All hydrocarbons as well as mixtures containing benzene with max. 5 Vol. %	60% toluene + 30% xylene + 10% methyl-naphthalene	Class III (19%)
DF 4a	Benzene and benzene containing mixtures (incl.4)	30% benzene + 30% toluene + 30% xylene + 10% methyl-naphthalene	Class III (25%)**
DF 5	Mono- and polyvalent alcohols (up to a max. 48 vol.-% methanol), glycol ethers	48 Vol.-% methanol + 48 Vol.-% IPA + 4% water	Class III (35%)
DF 5a	All alcohols and glycol ethers (incl. 5 and 5b)	methanol	Class III (48%)
DF 6	Halogen hydrocarbons \geq 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 (including. 7a)	50 % ethyl acetate + 50 % methyl isobutyl ketone	Class II (43%)
DF 9	Aqueous solutions of organic acids (carboxylic) up to 10 % as well their salts	10 % aqueous acetic acid	Class III (8%)**
DF 9a	Organic acids (carboxylic, apart from formic acids) as well as their salts	50% acetic acid + 50% propionic acid	Class I
DF 10	Mineral acids (non-oxidizing) up to 20% and inorganic salts in aqueous solution (pH	Sulphuric acid (20%)	Class III (10%)
DF 11	Inorganic lye (except oxidizing) and inorganic salts in aqueous solution (pH>8)	Sodium hydroxide solution (20%)	Class III (11%)
DF 12	Aqueous solutions of inorganic nonoxidizing salts with a pH value between 6 and 8	Aqueous sodium chloride solution (20%)	Class III (13%)
DF 13	Amines as well as their salts (in aqueous solution)	35 % triethanolamine + 30 % n-butylamine + 35 % N,N-dimethylaniline	Class I
DF 14	Aqueous solutions of organic surfactants	1) 3 % Protectol KLC 50 + 2 % Marlophen NP 9,5 + 95 % water 2) 3 % Texapon N 28 + 2 % Marlupal O 13/80 + 95 % water	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%)

* values in brackets are Reduction of shore A hardness

** colour change

Class I: 3 d 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 h after the coating is removed from immersion in the test liquid.
Class II: 28 d without pressure	
Class III: 28 d with pressure	

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CHEMICAL RESISTANCE – ADDITIONAL MEDIA

Media	Temperature	Duration of Impact	Resistance*
Acids			
Sulphuric acid 50%	50°C	170 h	++
Sulphuric acid 30%	50°C	500 h	++
Phosphoric acid 85%	20°C	500 h	++**
Nitric acid 30%	20°C	500 h	+**
Acetic acid 20%	20°C	310 h	++
Lactic acid 30%	20°C	170 h	++
Lactic acid 30%	50°C	500 h	+
Sulphuric acid 20% + lactic acid 5%	50°C	170 h	++
Formic acid 5%	20°C	500 h	++
Formic acid 40%	20°C	500 h	+
Lyes			
Sodium hydroxide 50%	20°C	500 h	++
Sodium hydroxide 50%	50°C	500 h	++
Potassium hydroxide 50%	20°C	500 h	+
Ammonia 25%	20°C	310 h	-
Organic chemicals			
Ethanol 50%	20°C	310 h	o
Toluene	20°C	500 h	o
Gasoline acc. to EN 228 and DIN 51626-1	20°C	500 h	++
Specific solutions			
Silage water (3% milk + 1.5% vinegar +0.5% butyric acid)	40°C	500 h	++
Liquid manure (7% ammonium hydrogen phosphate)	40°C	500 h	++
Distilled water	40°C	500 h	++
Chlorine bleaching	50°C	170 h	++
Chlorinated water	20°C	500 h	++
Hydrogen peroxide 30%	20°C	500 h	++
Ammonium hydroxide 28%	20°C	500 h	++

* Tensile Strength development in comparison to untreated sample:

- ++ 100-80% > resistant without any changes
- + 79-55% > medium resistant
- o 54-45% > short term resistant (occasional contact or splashing mode)
- < 45% > not resistant

** Colour change

DISCLAIMER

The technical information and application advice given in this MB Construction Chemicals Solutions South Africa (Pty) Ltd 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.