

MetaLine® Series 500 Elastomeric armouring

Application leaflet



Careful surface preparation and correct processing are essential for achieving a good coating quality! Follow these processing instructions step by step and pay attention to all safety regulations!



Content of chapters

Your personal trainer

Read and understand this application leaflet thoroughly prior use of the system. Follow the procedure step by step as scheduled. Do not start processing if something is incomprehensible to you. You have a personal trainer who is happy to answer all your questions via telephone. Do not hesitate to contact him!

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Requirements

Following components are necessary for the correct processing:

- MetaLine Series 500 (Base + Solidifier)
- MetaLine 924 Borderline Corrosion Protection (optional)
- MetaLine 900 or 910 Primer (Base + Solidifier)
- MetaLine 990 Thinner/Cleaner
- MetaLine 930 Farbpigment
- Personal safety items (overall, glasses, breathing mask, gloves)
- Ventilation equipment
- Electronic balance with an accuracy of +/- 1 g
- Clean and proper mixing containers
- Airless-spray equipment or suitable paint spray gun

Note: In case of high humidity a skin can form on top of the **MetaLine Series 500 "Base"**. This skin can not be used and has to be removed prior to mixing.

Surface preparation

Apply MetaLine Series 500 only on **thoroughly roughened**, clean, degreased and dry surfaces. Sharp edges or bends have to be grinded down (**rounded**) to a radius of minimum 3 mm.

■ **Metal / Plastic** – blast all surfaces (cleanness of SA 2 1/2 – roughness Rz = min. 75 μ m; Rmax = min. 125 μ m. Use **sharp-edged** grit with a particle size between 1,0 mm and 2,0 mm (slag, steel grit). Glass bead blasting or needle scaling are insufficient and lead to an extremely reduced adhesion! Low impacted coating surfaces can be prepared alternatively by grinding or sanding.

Surfaces that were suspended to moisture or are contaminated with oil, salt (seawater) or chemical substances should be treated as follows to receive **maximum adhesion**:

- | | |
|---------------------------|----------------------------|
| 1. Sandblasting | (preliminary purification) |
| 2. Steam cleaning | (chloride neutralization) |
| 3. Flame treatment | (capillary drying process) |
| 4. Sandblasting | (roughening) |
| 5. Vacuum cleaning | (dust cleaning) |
| 6. Degreasing | (final purification) |

■ **Casted steel, Casted stainless steel, Casted iron or grey casted iron** – in case that these materials will be used later under immersion conditions, a special pre-treatment with **MetaLine 924 Borderline Corrosion Protection** is necessary.

■ **Rubber / Polyurethane** – rough intensely with a very abrasive grinding disc or with a carbid-tipped roughening tool (Pic. 3). The surface must not smear (do not overheat)!

■ **Used concrete** – remove paint coats etc. Absorb residues, oil or grease with oil binder. Steam-clean in addition of detergent. Rough mechanically. Flush with clear water (removal of the detergent). Let it dry (max. 3 % residual moisture).

■ **New concrete** – let it set minimum 28 days. Perform a moisture measurement (max. 3 % residual moisture). Remove loose parts and concrete mud. Rough the surface mechanically and dedust. Coating thickness of MetaLine Series 500 has to be minimum 1.5 mm on concrete!

Cleaning / Degreasing

Clean all surfaces with **MetaLine 990 (Thinner/Cleaner)** (Pic. 4) after roughing and vacuum cleaning. Use enough thinner to brush off /wash off all contaminations. Let it dry sufficiently. Multi-abrade smooth surfaces with a white cloth (rag) saturated with thinner. Redo until the cloth remains clean!



Pic. 3 - Roughening tool for rubber



Pic. 4 - MetaLine 990 (Thinner/Cleaner)

2. Pre-Treatment

Pre-Treatment

Metallic surfaces which can not be sandblasted, or which are impacted later by immersion in liquids, have to be pre-treated with **MetaLine 924 Borderline Corrosion Protection** (Pic. 5). This results in an additional, electro-chemically active, corrosion protection. This pre-treatment generally increases the adhesion to all kind of metallic substrates.

First roughen all substrates intensively with manual tools (e.g. grinding paper). Clean afterwards as indicated in chapter 1 "Cleaning / Degreasing".

Stir MetaLine 924 Base prior use. Mix with a weight ratio of 1,1 : 1 (MetaLine 924 Base to Solidifier) and let it rest for 15 minutes. Apply within 8 hours in a **single** coat. Use a gravitation feed spray gun or a clean brush. Keep the coverage rate of approximately 125 gr/m².

Let it set for a **minimum** of 6 hours, maximum 10 days prior to continue with priming (chapter 3) with **MetaLine 900 Universal Primer**.

Do not overcoat **MetaLine 924 Borderline Corrosion Protection** with itself (no double pre-treatment)!



Pic. 5 - MetaLine 924 Borderline Corrosion Protection

3. Priming

Priming

■ **Inflexible surfaces** – treat metal, stainless steel, aluminium, GRP, polyester, epoxy, concrete or wood with **MetaLine 900 Universal Grundierer (Primer)** (Pic. 6). Shake both components well before use. Mix MetaLine 900 with a weight ratio of 3:1 (Base to Solidifier) and let it rest for 5 minutes. Brush on, roll on or spray on one thin layer within 5 h after mixing. Keep the coverage rate of approximately 70 g/m². Overcoat at least 30 minutes, but maximum 4 h later with MetaLine Series 500.

For spraying (gravitation feed gun, nozzle size approx. 1.8 mm) apply MetaLine 900 with **low air pressure** (approx. 1.5 bar). Choose a narrow spray fan. Otherwise a powdery layer - that must be removed after drying with MetaLine 990 thinner - will be formed.

After the maximum overcoating time (4 hours at 20°C) has elapsed sandblast the surface and restart.

■ **Flexible surfaces** – treat rubber, polyurethane, PVC and all flexible materials with **MetaLine 910 Gummi Grundierer (Rubber Primer)** (Pic. 7). Mix MetaLine 910 with a weight ratio of 100 : 4 (Base to Solidifier) and use within 5 h. Brush it into the surface with pressure and rotary moves using a stiff bristle brush. Coverage is approx. 200 g/m² per layer.

Brush on carefully a second layer of MetaLine 910 after a drying time of at least 1 h and not more than 12 h. Do not damage the first layer. Spray on MetaLine Series 500 within 20 minutes. If the second layer MetaLine 910 dries longer than 20 minutes the surface loses its stickiness. In this case apply a new coat of MetaLine 910.

■ **Dipolar Plastics** – PE, PP and POM and related plastics need a thermal shock treatment before priming. Sandblast or roughen the surfaces thoroughly. Clean with MetaLine 990 Thinner/Cleaner (as indicated in chapter 1 "cleaning / degreasing"). After evaporation of the cleaner use an open flame and apply a very short, shock-like flame treatment to the substrate - do NOT melt the plastic! Apply **MetaLine 900 Universal Primer** immediately without any waiting time. Take care about the flammable characteristics of MetaLine 900!



Pic. 6 - MetaLine 900 Universal Primer



Pic. 7 - MetaLine 910 Rubber Primer

4. Mixing / Dilution

Mixing

Never mix the individual components of MetaLine 560/580/590/598 with each other. Only use Base and Solidifier components of the same product type.

Shake MetaLine Series 500 components well. Pour MetaLine Series 500 Base and Solidifier components in the correct mixing ratio (per weight) into a clean mixing container. Use an electrical mixer and stir for at least 3 minutes. Scrape in side parts and bottom part of the mixing container with a spatula.

Units which have been opened should be resealed with a nitrogen blanket. Close jars and pails correctly to avoid air exchange. MetaLine Series 500 Base and Solidifier parts are moisture sensitive and should not be stored longer than 6 months after opening.

Dilution

For the correct spray application the viscosity of MetaLine Series 500 has to be adapted to the spray equipment used. Use **MetaLine 990** (non-flammable) or **MetaLine 995** (flammable). The dilution ratio depends on temperature, spray pressure, tip size etc. It varies between 0.5 to 2 parts dilutant to 1 part of mixed MetaLine Series 500. Material which is not diluted enough will run and sag on vertical surfaces more than material which is overdiluted! Never use other dilutants as they could severely attack the material chemistry and lead to cure and quality problems.

Attention: Check suitability (chemical resistance) of hoses and gaskets used in your spray-equipment.

Additional Components

Following components can be added to the MetaLine Series 500:

■ **MetaLine 930 Farbpaste**

to individually adapt the color
approx. 0,5 % (max. 5 ml per kg)

■ **MetaLine 940 Verdickungsmittel**

to ease and fasten surface build up
approx. 0,5 % (max. 5 gr. per kg)
Higher amounts of **MetaLine 940** will lead to deairing problems!

■ **MetaLine 950 Antistatika**

to create temporary antistatic material properties
approx. 3,0 % (max. 30 gr. per kg)
Non suitable to use with MetaLine 560 (leads to product softening)!

■ **MetaLine 960 UV-Stabilisator**

to increase the UV-resistance
approx. 0,25 % (max. 2,5 gr. per kg)

■ **MetaLine 970 Strukturzusatz**

to create a structured surface finish
approx. 20% (max. 200 gr. per kg)

■ **MetaLine 980 Haftreibungsreduktion**

to lower the surface friction properties
approx. 0,5 % (max. 5 gr. per kg)

Thoroughly mix in the desired additional components into the MetaLine Series 500! Keep within the maximum levels of addition.

Application

■ **Airless-Spraying** - Dilute until a smooth and regular spray pattern is achieved without any strikes. Apply a thin coat and let it set for 20 minutes (20 °C). Afterwards apply the desired total thickness using coats with 0.6 mm thickness. Let it cure for 15 minutes (20 °C) between coats. Tip size should be #10 to #17 (0.25 to 0.5 mm). Additional dilution can take place at any time during application. Missing dilution will lead to runs and sags!

■ **Gravitation Feed Gun** - Dilute at least 1 : 1 and apply. Maximum air pressure is 3 bars. Tip size starting from 1.5 mm or bigger. This type of equipment is only recommended for very small surfaces and very thin coats.

■ **Brush application** - Only use very little dilution and apply with a stiff brush or spatula. Take care not to incorporate too much air. Thickness available per coat will be close to 0.7 mm. Let coats dry for at least 45 to 60 minutes (20 °C).

Note: **MetaLine 560** must not be applied thicker than 1 mm per coat. Otherwise cracking of the curing coating might occur! In case thicker coats are required, take care for a minimum curing time of 6 hours between each coat of **MetaLine 560**.

Clean all tools with **MetaLine 990** or 980 immediately after use. Do not clean mixing containers. After curing the residues can be pulled out very easily.

Structurized surface finish

To create a structurized finish of MetaLine Series 500 please contact the coach mentioned in the content of chapters.

Overcoating

If more than 24 hours elapse between coats, repriming is necessary. Grind the cured surfaces (take care not to overheat). Apply one coat of **MetaLine 900 Universal Primer** as described under chapter „3“ of this application leaflet.

In case different types of MetaLine Series 500 are applied over each other, a minimum drying time of 6 hours between the change of material is recommended.

Curing

10 days (20 °C) are necessary for a complete chemical cure of MetaLine Series 500. However, a light mechanical load can be applied after 24 hours. Do not apply temperatures higher than 35 °C during cure time as blistering becomes a danger.

Working Conditions

Do not apply under the following conditions: Below 10 °C, over 80 % humidity, fog, near the dew point. Avoid direct sun-light as yellowing will take place. Cure between 10 and 30 °C. **Never** apply heat with an open flame.

Store the sealed material containers in a dry place at 20 °C. Avoid flames, moisture, ammonia, or substances containing active hydrogen. Ventilate very well.

6. Health protection & Safety

Health protection

Severe health damage is possible. Apply only if an exhaust system (ventilation) is available. **Ventilate well** during operation. Do not inhale vapors. Avoid contact with eyes or skin. Do not eat, drink or smoke. Use closed protective clothing, headdress, protective glasses and gloves (latex or neoprene). Wear respirator according to protection class 6942 **A2/P2** or air-supplied mask. Do not target spray jet at living creatures! Do not let fluid (uncured) materials reach the sewage.



Gesundheits-
schädlich / Harmful



Leicht entzündlich
Flammable

First Aid measures

- **Skin contact:** Wash with plenty fresh water and soap. Change immediately contaminated clothing.
- **Eye contact:** Rinse immediately 15 minutes with water. Call a doctor at once.
- **Inhalation:** Remove person to fresh air. Apply respiratory help if needed. Immediately consult a doctor.
- **Ingestion:** Do not swallow materials! Call a doctor at once. Drink water to dilute.
- **Fire:** Use CO₂, foam or dry powder. Fire fight only with protective clothing and independent respiration-system.

Declaration as per GefStoffV

■ MetaLine 900 Base	Xi + F	Methyl-Ethyl-Ketone (MEK)
■ MetaLine 900 Solidifier	Xn + F	MEK, 4,4-Methylene-Bisphenyl-Isocyanate
■ MetaLine 910 Base	Xi + F	Methyl-Ethyl-Ketone (MEK)
■ MetaLine 910 Solidifier	Xn + F	Polyisocyanate, Ethylacetate
■ MetaLine 924 Base	Xi + F	Methyl-Ethyl-Ketone (MEK)
■ MetaLine 924 Solidifier	Xn + F	MEK, Diphenylmethan-4,4'-diisocyanat
■ MetaLine 560 Base	Xn	2,4 Tolouene-Diisocyanat (TDI), Methylenechloride
■ MetaLine 560 Solidifier	Xn	Dihydro-2(3H-Furanone)
■ MetaLine 580 Base	Xn	Methylene-bis-(cyclohexylisocyanate) (HMDI), Methylenechloride
■ MetaLine 580 Solidifier	Xn	Diethyltoluoldiamine
■ MetaLine 590 Base	Xn	Methylene-bis-(cyclohexylisocyanate) (HMDI), Methylenechloride
■ MetaLine 590 Solidifier	Xn	Diethyltoluoldiamine
■ MetaLine 598 Base	Xn	Methylene-bis-(cyclohexylisocyanate), Methylenechloride
■ MetaLine 598 Solidifier	Xn	Diethyltoluoldiamine
■ MetaLine 940	Xn	Xylene
■ MetaLine 950	C + N	Cocosfettaminoxethylat
■ MetaLine 970	Xi + F	Metyl-Ethyl-Ketone (MEK)
■ MetaLine 990	Xn	Methylenechloride (MCL)

MetaLine 940 + 950 + 990 + 560/580/590/598/900/910/924 Base and Solidifier are classified to be **harmful**. In addition MetaLine 900/910/924/970 are **highly flammable**. Read and understand the safety precautions.

7. Processing data (overview)

■ MetaLine 924 Unterwanderungsschutz (Borderline Corrosion Protection)

Mixing ratio	1,1 : 1	per weight
Mixing ratio	1 : 1	per volume
Consumption	125 gr/m ²	
Number of coats	1	
Processing time	8 h	at 20 °C
Overcoating time	6 h	minimum at 20 °C
Overcoating time	10 days	maximum at 20 °C

■ MetaLine 900 Universal Grundierer (Universal Primer)

Mixing ratio	3 : 1	by weight
Mixing ratio	3,15 : 1	by volume
Consumption	70 gr/m ²	
Number of coats	1	
Processing time	5 h	at 20 °C
Overcoating time	30 min	minimum at 20 °C
Overcoating time	4 h	maximum at 20 °C

■ MetaLine 910 Gummi Grundierer (Rubber Primer)

Mixing ratio	100 : 4	by weight
Consumption	200 gr/m ²	per coat
Number of coats	2	
Processing time	5 h	at 20 °C
Overcoating time	1 h	minimum (1 st layer)
(at 20 °C)	12 h	maximum (1 st layer)
Overcoating time	5 min	minimum (2 nd layer)
(at 20 °C)	20 min	maximum (2 nd layer)

■ MetaLine Series 500 (560 / 580 / 590 / 598)

Processing time	30 min	non diluted
(at 20 °C)	2 h	diluted
Wet film thickness	0,6 mm	per coat
Overcoating time	15 min	minimum
Overcoating time	1 day	maximum
Cure time	1 day	light load
(at 20 °C)	3 days	full mechanical load
(at 20 °C)	10 days	full chemical load

7. Processing data (overview)

■ MetaLine 560 Polyurethane Coating

Mixing ratio	100 : 10	per weight
Consumption	1,70 kg/m ²	s = 1,0 mm

■ MetaLine 580 Polyurethane Coating

Mixing ratio	100 : 15	per weight
Consumption	1,75 kg/m ²	s = 1,0 mm

■ MetaLine 590 Polyurethane Coating

Mixing ratio	100 : 15	per weight
Consumption	1,4 kg/m ²	s = 1,0 mm

■ MetaLine 598 Polyurethane Coating

Mixing ratio	100 : 15	per weight
Consumption	1,55 kg/m ²	s = 1,0 mm

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