MetaLine®.com

surface protection

Elastomeric repair coatings

quarrying, raw material exploitation, concrete processing, plaster production, civil engineering and tunnelling

MetaLine® Series 700

fighting against erosion, corrosion, cavitation, wear & tear & material build-up

Equipment life is just too short without protection!

MADE IN GERMANY

60 YEARS OF EXPERIENCE

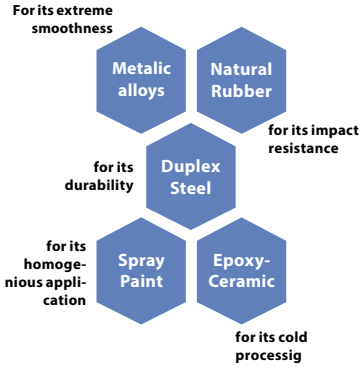
Process Description

Changing surfaces to the better ...

Absorbing destructive energy instead of deflecting it! Sprayable elastomeric high performance coatings to solve erosion, corrosion, cavitation and abrasion problems in processing plants!

MetaLine® Series 700 incorporates the primary technical characteristics of completeley different materials: The polymeric application process is as straight-forward as with an epoxy-ceramic repair product. But the compound itself functions like rubber, and finally possesses erosion resistant qualities equal or **greater than Duplex Steel!**

NOT rubber, NOT steel, NOT epoxy and **by far NOT paint** – but an ingenious mix out of all four of them!



MetaLine® Series 700 extends the service life of metallic substrates by initially storing the destructive kinetic energy (like rubber) and returning it with a time delay – but reduced bounce. The process is based on a duroplastic **polymer design** instead of a traditional vulcanization. No seams, no tension-induced delamination and no massive equipment requirements.

The result is a hydrodynamically resistant protective coating that exhibits unmatched erosion & cavitation resistance. Ceramic composites and conventional protective coatings are FAR inferior in terms of wear resistance and service life!

The process is suitable for repair purposes or the primary coating of metallic components as well as for the repair of existing rubber linings!

Do Coatings Protect against Corrosion and Wear?

The industry has myriad spray-on, brush-on and scrape-on products to offer, the producers of which claim them to have corrosion- and wear-reducing effects. Until now, pump users have had to take a trial-&-error approach to finding out which, if any, such products actually do help. Now, in order to shed some light in the dark area of coating technology, KSB has conducted a voluminous series of pertinent tests at its materials laboratory in Pegnitz.

Bernd Schramm
Anja Dewars
Andreas Kühl

Pump materials are subject to very complex loads & stresses. The structural and hydraulic design of pumps involves thermal and mechanical stress exposure. Additionally, all wetted surfaces are exposed to the effects of the fluid itself. Depending on the nature of the fluid, such exposures can cause corrosive, abrasive and cavitation damage to pump components. Grey cast iron and low-alloy steel are standard materials for drinking water pumps, wastewater disposal pumps and cooling water pumps – the main determining factors being price, workability and availability. However, due to their limited resistance and durability, such materials soon come up against their duty limits when they are exposed to solids-laden or corrosive pumped fluids – as evidenced by damaged hydraulic components, e.g., impellers and volute casings. To avoid the need for expensive stainless materials in such cases, the industry makes and sells a wide range of coatings in other native solutions. However, it is usually difficult to locate a really suitable kind of coating, because there are any number of boundary conditions to be satisfied.

Hard phases very hard particles of ceramic material

Fundamental criteria:

- chemical resistance with respect to the fluid at service temperature
- geometrical accessibility of the component for the application of a coating
- potable water approval for the coating
- machineability of the coating on sealing surfaces and in gap areas

For users, the problem is to locate among all the various makes and types a coating to fit the case at hand. The producers' advertising vocabulary is full of terms like "extremely wear-resistant", "outstandingly resistant to corrosion", "hard-wearing", "resistant to cavitation" and so on, but all that is of little help. In order to realistically assess such products' fitness for use in and on pumps, KSB subjected a large number of products to wear and cavitation tests.

Two groups of coatings

On the basis of their respective organic binder phases, the coatings in question can be roughly assigned to one of two categories: epoxy resins and polyurethanes.

Fig.: Upper casing half of a big water pump, with epoxy resin base coating for wet purposes

technica digest No. 10, December 2004 © KSB Aktiengesellschaft

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And what is the response of the international markets?
To consider MetaLine® not only as a repair solution but more and more as a novel product concept for the engineering design of new equipment as well. Tested & approved by key **OEM manufacturers**, R&D laboratories & multiple public authorities!

Daily maintenance routine – irreparable with traditional technologies. A situation no field technician want to see anymore ...

... and that is the way it should be! The **MetaLine® re-surfacing technology**: repairs extending the durability of original spares and offering lower maintenance costs.

More than 60 years of experience

In 1960 MetaLine® started its global surface protection activities and developed itself into the **oldest German** manufacturer of synthetic repair compounds and maintenance coating solutions.

Our Series 700 technology has become **OEM (Original Equipment Manufacturer)** Standard in different industries.

When handling our products, we place great importance on professional instruction! Training courses are part of our sales.

MetaLine® has its headquarter located near Stuttgart (Germany) and through our partners we are represented not too far from you.

MetaLine's time zone is UTC+1

Phone: +49 (0) 7034 31000
E-Mail: info@metaline.de

Application Process

MetaLine® Series 700 is a solvent-free, two-component elastomer that can be applied by spraying, injecting or casting. Polymerization starts after 1 minute. The coating thickness ranges between 1 mm (40 mils) and 20 mm (3/4 inch) and can be achieved without material sagging on vertical surfaces. MetaLine® Series 700 can be used in **many climatic conditions** (as in zones with extremely high humidity).

MetaLine® Series 700 adheres to **various substrates** including steel, alloys, aluminium, rubber, concrete, wood and different plastics. It is NOT necessary to heat the component to be coated. After 5 minutes the coating is dry to touch and most parts can go back in service after 24 hours (at 20 °C / 68 °F). The temperature resistance is between -50 °C (-58 °F) and +120 °C (+248 °F), depending on the relevant application.

MetaLine® Series 700 cures without any tension or shrinkage. In addition to its chemical bonding process, a mechanical **memory effect** is developed. This permanently ties the coating to the substrate, thus counteracting any separation tendency that is normally associated with conventional rubber sheets. MetaLine® Series 700 can be recoated and repaired at anytime!

MetaLine® Series 700 is available in three different degrees of hardness

- **MetaLine® 760 (60 Shore A)** for the repair of existing rubber linings or the maintenance of rubber belts/pulley lagging
- **MetaLine® 785 (85 Shore A)** is the first choice to protect extremely abrasion-, erosion- or impact abused components
- **MetaLine® 795 (95 Shore A)** develops remarkable non-stick properties due to its low coefficient of static friction (e.g. in silos)

The strength of MetaLine® Series 700 lies in its erosion and wear resistance, which is comparable to high-alloy steels and armors. With a density of just 1.05 g/cm³ (0.038 lb/in³), MetaLine® represents the **most lightweight duroplastic wear protection concept**. The weight-related advantage, e.g. on pump-impellers or rotors, compared to heavy metallic armoring or welding overlay is considerable.

MetaLine® Series 700 is no longer a temporary repair idea, but a general design improvement in efficiency and service life!

MetaLine® APPLICATOR S-700 and Series 700 double cartridges – because spraying simply gets smoother & better than brushing!

Just a few steps to go!

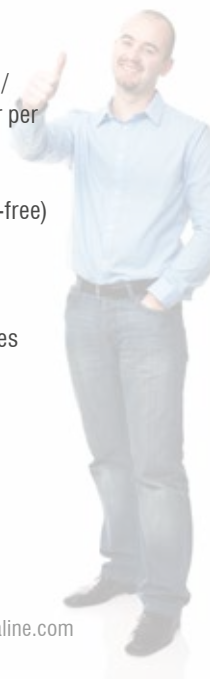
The use of highly functional coatings requires competent **surface preparation**. The surfaces to be coated shall be dry, clean, free of grease and salt and need to have **a rough blasted surface profile**. The abrasive grit used must have a particle size of approximately 1-2 mm (40-80 mils).

1. Metal substrates are coated with MetaLine® 924 first. This **electro-chemically active corrosion protection** prevents borderline penetration on coating edges and protects damaged areas from rusting.
2. After drying, a double coat of MetaLine® 900 Universal Primer on solid surfaces or MetaLine® 910 on rubber surfaces is applied.
3. Finally, MetaLine® Series 700 protective coating with the required film thickness and color is sprayed on!

A process created by practice!

The APPLICATOR S-700 does not come into contact with the coating material itself, so the tool does **not require any cleaning** or maintenance after the job is done. It is the world's first spray process without equipment cleaning:

- based on low-pressure technology (about 5 bars / 72 psi) only 200 liters (52 gal) of compressed air per minute required
- automatic dosing and mixing (no off-ratio risk)
- similar to wet-paint processing (however solvent-free)
- no mixed waste (similar to a 'DIY' spray can)
- re-use of opened cartridges
- no equipment cleaning after spraying
- designed for rough on-board working atmospheres
- investment costs about 1,000 EUR



General Mining

MetaLine® Series 700 – **Wear and corrosion protection in the extraction of resources**

Applicable directly on-site even under adverse climatic conditions (high temperatures and/or up to 100% of humidity). Longer service life due to its polymeric material character compared to natural rubber sheet linings.

Applications

- spiral concentrators
- process vessels
- cyclones
- mixers
- separators

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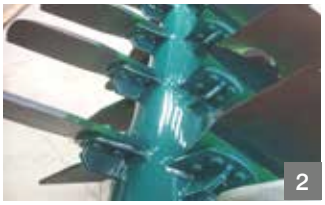
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Reference

- can be applied after intensive instruction by own qualified staff
- for complex geometries unbeatably easier than rubber processing
- material quality and processing expertise „made in Germany“

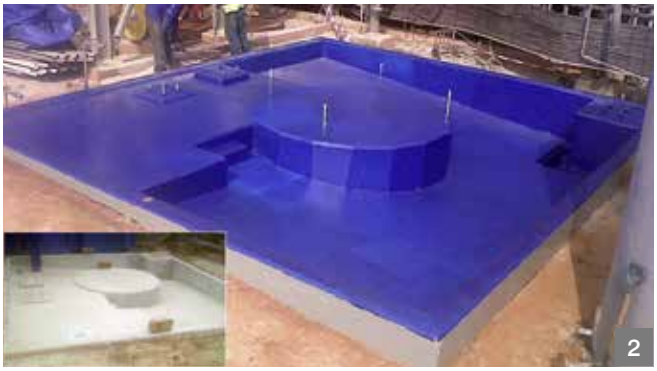
General Mining

MetaLine® Series 700 – **Wear and corrosion protection in the extraction of resources**

Completely seamless surface protection with rubberlike properties but without the need for hot-vulcanization or autoclave equipment. Unlike rubber an entirely tension-free installation with no disbonding tendency. Can return back into service already within about 24 hours.

Applications

- agitators
- magnetic separators
- process tanks
- storage containers



Reference

- more durable than conventional rubber linings or plastic sheet linings
- non-toxic in processing, solidification or later disposal
- theoretical and practical support by MetaLine® trainers on site can be ordered

Flotation Accessories

MetaLine® Series 700 – **Wear and heavy duty corrosion protection for processing plants**

Life-time extension by use of cold-applicable, visco-elastic coatings. Physical properites absorbing massive scratching, impacting and abrasive forces. Metal-free and high purity for chemically complex separation processes.

Applications

- distributors
- screening frames
- thickeners
- pumps

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Reference

- suitable for all types of minerals and ores in open pit mining
- in use by processing plant manufacturers as OEM lining
- reliable, effective but certainly not the cheapest form of protection

Flotation Tanks

MetaLine® Series 700 – **Corrosion & wear protection in mineral processing plants**

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MetaLine® meets heavy duty off-shore corrosion protection standards. Electro-chemical anodic properties combined with a rubberlike atmo-spherical encapsulation surpasses over 6,000 hours saltspray-chambertest as per ASTM. Withstands up to 70 bar (1,000 psi) of water pressure.

Applications

- flotation cells
- flotation tanks
- flotation accessories
- attritor mills (wet milling)

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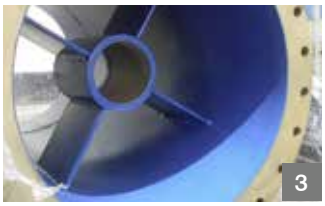
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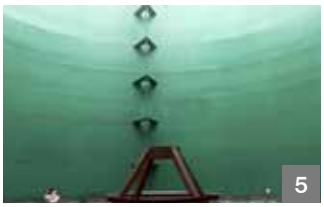
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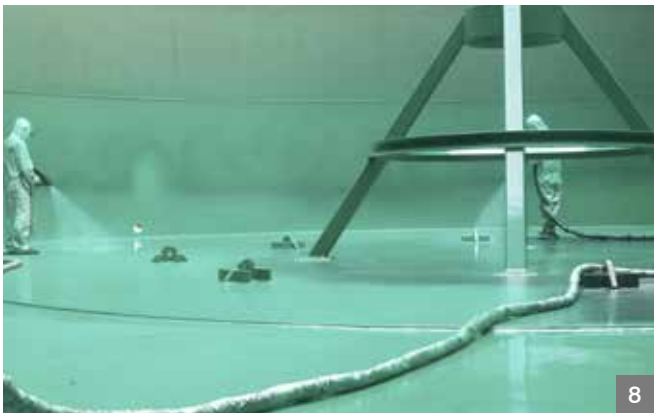
Reference

- many times more erosion resistant than steel or natural rubber
- partially quickly and easily repairable or recoatable
- good chemical resistance from pH 3 to 11 at standard temperature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Screening Decks

MetaLine® Series 700 – **Wear protection in classification / screening / sorting technology**

Wear and corrosion protection systems developed for extensive continous or intermittent vibration exposure. Extremely resistant and durable. Bolts, seams, flanges etc. can be overbridged without any joints. Applicaple and repairable in-situ.

Applications

- multi-deck screening machines
- rotary screening machines
- wet screening plants
- drum screening machines
- tumbler screening machines
- banana screening frames

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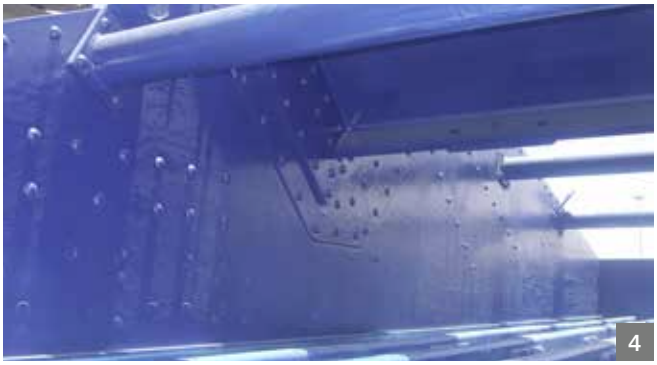
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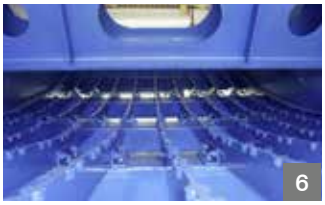
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Reference

- far more wear resistant than rubber and seamless to install
- excellent corrosion protection for wet screening machines
- different layer thicknesses depending on the local load – without joints or edges

Screening Frames / Filters

MetaLine® Series 700 – **Wear protection in dry / wet classification**

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Protects, maintains and safeguards the screening function of frames and PU-screens. Permissible for ultra-pure minerals due to its complete metal free character. Bonds perfectly to used polyurethane surfaces.

Applications

- screening frames
- drum screen constructions
- vibratory screens
- sizers

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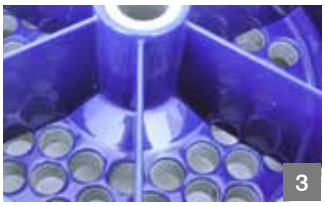
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Reference

- vibration-resistant with an exceptional long-term bonding
- optional with non-stick properties to minimize sticking to the side surfaces
- extremely light in order not to add too much weight to the equipment

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Open Pump Impellers

MetaLine® Series 700 – **Wear protection for pumps & fluid-flow systems**

Extremely smooth surface characteristics, which can aditionally be equipped with non-stick properties. This results in a hydrodynamically optimized surface structure which leads to energy savings and a distinct increase in efficiency.

Applications

- steel / stainless steel impellers
- brass impellers
- polyurethane impellers
- rubber impellers
- FRP impellers

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Reference

- extremely high bond strength of up to 15 N/mm² (2175 psi) on steel
- vibration-resistant and a non-magnetic film configuration
- hydrodynamically optimized, extremely smooth surface structure – **reduces turbulences**

7

Closed Pump Impellers

MetaLine® Series 700 – **Wear protection for pumps & fluid-flow systems**

1

Seamlessly sprayable elastomeric coatings to increase pump service life. Exceptionally resistant against erosion & cavitation. Low structural weight. Hydrodynamically optimized due to an impressive surface smoothness.
Not affected by pulsation forces.

Applications

- steel / stainless steel impellers
- brass impellers
- polyurethane impellers
- rubber impellers
- FRP impellers

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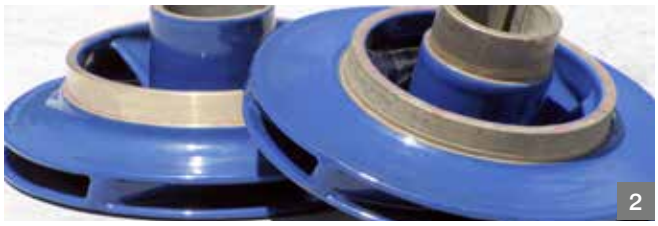

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Reference

- hydrophobic properties increase the water flow velocity
- generally recommended for rotational speeds up to 1,900 rpm
- **decontaminable** in case of the presence of radioactive radiation

Pump Semi-Shells

MetaLine® Series 700 – **Wear protection for pumps & fluid-flow systems**

Elastomeric repair and coating materials to be applied by spraying or troweling. Service life is equal if not superior compared to original spare parts (OEM). Maximum ecological sustainability by avoiding
waste and protecting natural resources.

Applications

- rubber semi-shells
- PUR elastomeric semi-shells
- casted steel semi-shells

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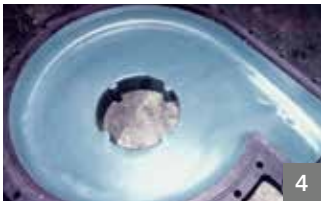

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Reference

- resistant to salt water and many chemicals in a pH range from 3 to 11
- according to DIN 53516 dynamic **abrasion index** > 55 mm³ (0.003 in³) (rubber > 120 mm³ / 0.007 in³)
- suitable for natural rubber and many synthetic rubber qualities such as EPDM or Neoprene

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Spiral Pump Casings

MetaLine® Series 700 – **Wear protection for pumps & fluid-flow systems**

1

Up to 50 times more wear-resistant compared to famous epoxy ceramic brands (laboratory testing performed by KSB® / Andritz Hydro® / others).

Approximately 25 % higher erosion resistance compared to stainless steel (AISI 316) at a slurry impact angle > 40°.

Applications

- grey cast iron casings
- stainless steel casings
- duplex steel casings
- special alloy casings

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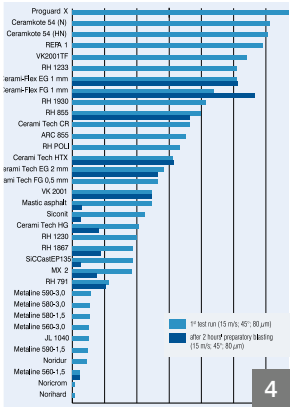

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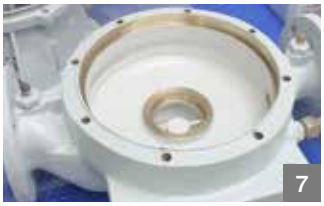

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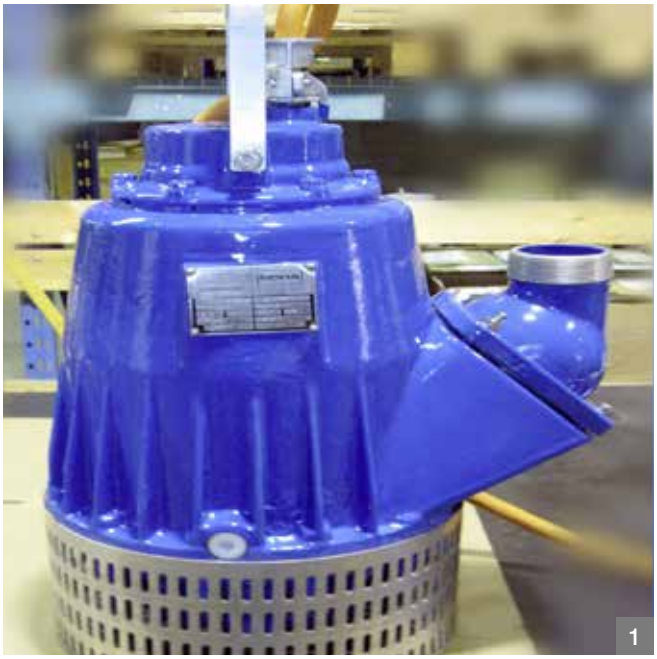
Reference

- **very low specific density** of 1.05 g/cm³ (0.038 lb/in³)
- suitable for up to 40 % solids content in slurry conveying
- up to 550 % longer service life compared to gray cast iron / casted steel volutes (pic. 4)

Submersible Pumps

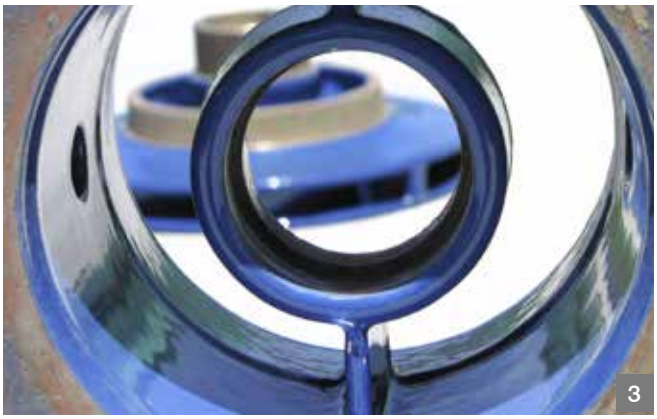
MetaLine® Series 700 – **Wear protection for pumps & fluid-flow systems**



Sprayable elastomeric coatings to protect exterior and interior surfaces of submerged equipment against chemical, mechanical, abrasive and corrosive attack. Self-processable, durable and exceptionally economical.

Applications

- waste-water pumps
- sewage pumps
- lifting / bilge pumps
- submersible pumps
- submersible agitators
- flow accelerators



Reference

- hydraulically and pneumatically pressure resistant up to a maximum of 70 bars (1015 psi)
- feasible investment costs for serial production purposes
- visual **wear control** indication by a colour change within the layer build-up

Slurry Pipes

MetaLine® Series 700 – **Service life extension when transporting highly abrasive liquids**

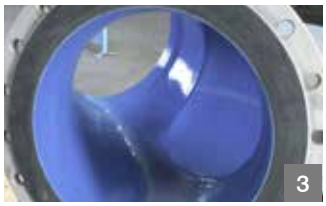
Designed for the most abrasive media. Can be applied in any desired layer thickness depending on the load. Proper chemical resistance. Also suitable to improve flange sealing situations.

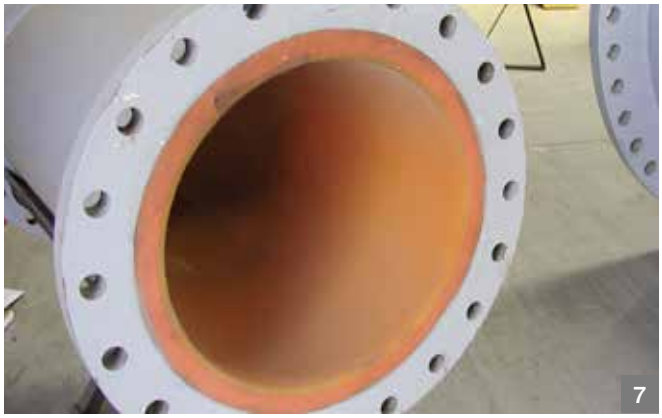
Applications

- pipes / pipelines
- connectors
- pipe bends / elbows
- manifolds

Maximum coating length for straight pipes (ML 760)

Diameter:	minimum 4 inch	max. length	6,5 ft
Diameter:	4 - 12 inch	max. length	10 ft
Diameter:	12 - 30 inch	max. length	13 ft
Diameter:	plus 30 inch	max. length	20 ft





Reference

- useful up to a grain size of 8 mm (315 mils) and smaller
- also as a repair method for already existing damaged rubber linings
- designed for single part coatings at the construction site

Screw Conveyors

MetaLine® Series 700 – **Wear protection with anti-stick effect in bulk material conveying**

For a combined corrosion & wear protection. Optionally with remarkable non-stick properties. Bonds peramanently to steel, stainless steel, alloys, aluminium, duplex, Hardox®. Variable colors (sandwich) to identify local wear and predict the remaining service life – without full inspection.

Applications

- trough screw conveyors
- tube screw conveyors
- screw dosing devices
- archimedean screws

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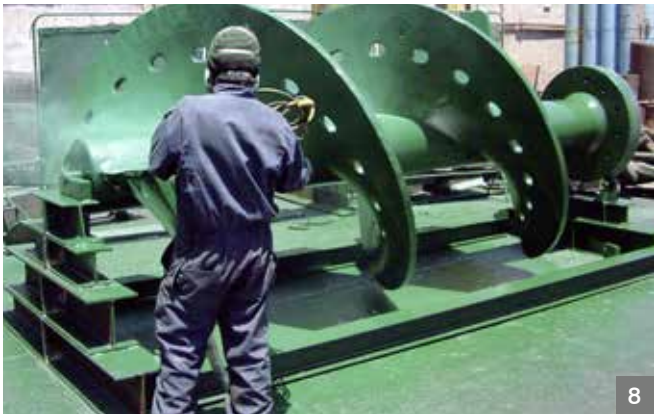
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Reference

- recommended for graded, homogeneous materials
- also for the transport of damage-sensitive food products
- gap dimension between screw and trough must be larger than the medium to be conveyed

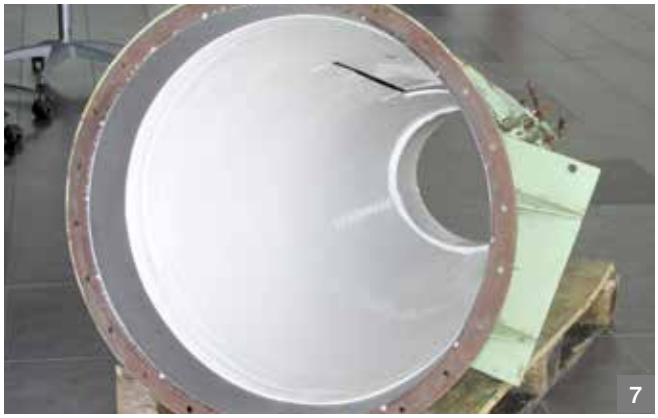
Cyclones / Separators

MetaLine® Series 700 – **Wear protection for solids separation**

Sprayable and trowelable elastomeric compounds for lining repairs or complete resurfacing of equipment subject to wear. Suitable for flow velocities up to 70 m/s (230 ft/sec). Impact and shock resistant..

Applications

- centrifuges / sifters
- decanter hoods
- hydro cyclones
- turbo separators
- precipitators



Reference

- can be applied in any required coating thickness
- installable in different colors on top of each other as a visual wear indicator
- electrically non-conductive and therefore not permitted for ATEX areas

Heavy Trucks

MetaLine® Series 700 – **Non-stick surfaces in bulk transport**

For the value preservation of heavy truck bodies and as dampening underbody protection system. A better surface friction value compared to UHMWPE and an about 5 times more wear resistant character recommends it as a high-end load release surface technology.

Applications

- dumpers
- flatbed trucks
- street sweepers
- reseach / expedition vehicles

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Reference

- functional from - 50 °C (-58 °F) to plus 60°C (140 °F) in harsh environmental conditions
- completely waterproof and no corrosion underneath can develop
- also in a strippable version for rental or leasing machines

Earthmoving Equipment

MetaLine® Series 700 – **Non-stick surfaces in bulk transport**

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If material builds up like “glued”, wear resistant, non-stick coatings are a preferred solution to get back the efficiency of earth moving equipment.

MetaLine® 795 is as effective as PTFE however mechanically far more resistant.

Applications

- excavator buckets
- soil drilling rigs
- bulk transporters
- skip bins

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Reference

- no typical tenting or lifting as with plastic sheet linings
- no additional weight or lost volume inside the excavator bucket
- no seams, no edges but an extremely low surface friction

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Concrete Processing

MetaLine® Series 700 – **Wear and adhesion protection in ready-mix concrete processing**

For the optimized surface protection when producing and transporting concrete. Minimizes sticking, simplifies cleaning, reduces noise and is extremely impact and wear-resistant.

Applications

- buckets
- gutters
- troughs / chutes
- mixers (stationary / truck mixer)

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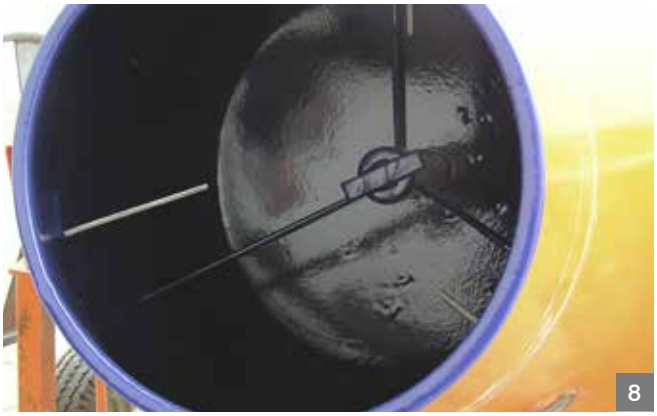
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Reference

- concrete can be washed off with a water jet even when freshly hardened
- the complete emptying of concrete troughs is accelerated
- can be stored for up to 24 months and is therefore always available when needed

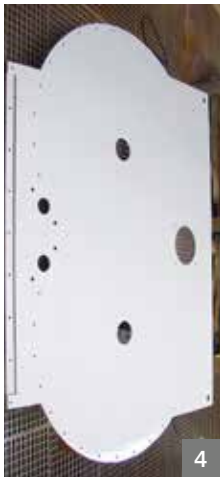
Concrete Molds

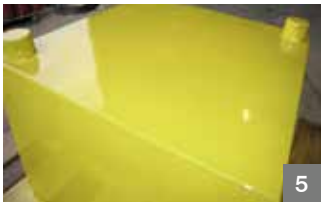
MetaLine® Series 700 – **Non-stick surfaces in fair faced concrete processing**

Extremely smooth elastomeric coatings with excellent mold release properties – in order to obtain perfect surface qualities. Wear resistant, precise in its shape and fully corrosion resistant. The visual appeal of natural stone surfaces or graphical elements can be duplicated.

Applications

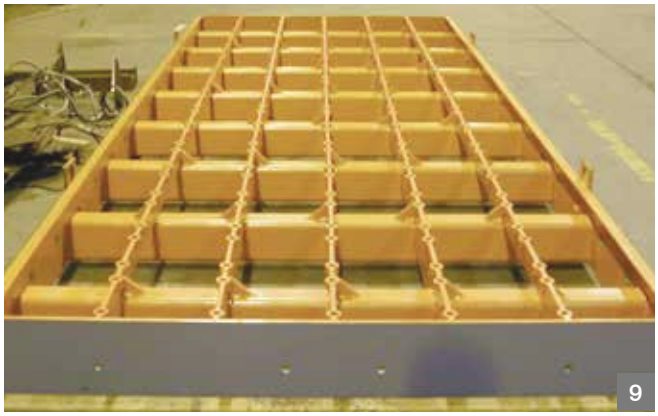
- molds
- formworks
- sculptures
- surface decorations





Reference

- suitable and functional for all concrete qualities
- massive reduction of the daily cleaning efforts
- layer thicknesses from 1.5 mm (60 mils) depending on the demolding cycles



Drive Pulleys / Rollers

MetaLine® Series 700 – **Elastomeric coatings for friction improvement**

Sprayable elastomeric compouds for the repair of existing linings or complete new roller coatings. Available hardnesses 60 / 85 / 95 Shore A in a seamless quality. End-faces can be covered as well.

Applications

- drive rollers
- vacuum rollers
- transport rollers
- pulley lagging
- friction wheels
- diabolo rollers
- cable reels

Reference

- mechanically precise remachining up to 1/100 mm (1/2 mil)
- static friction values up to my(0)= 0.7 ensure maximum conveying effect
- under certain circumstances directly deployable without mechanical post-processing

Fans / Blowers

MetaLine® Series 700 – **Non-stick surfaces in extraction and ventilation systems**

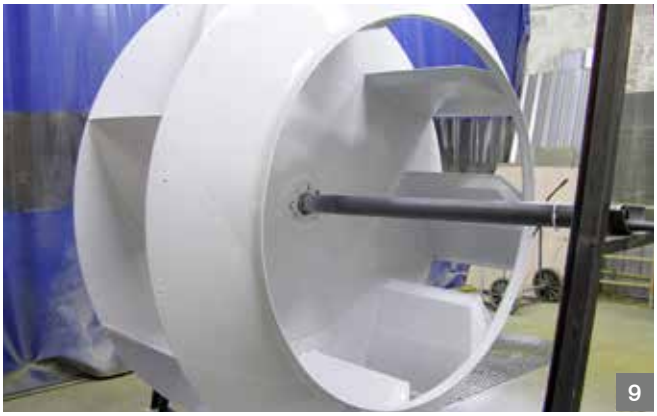
The remarkably low density of only 1,05 kg/m² per mm film thickness (0.215 lbs/ft²/40 mil) keep equipment weight low. Impact and erosion-resistant. Electrically non-conducting (must not be used in "EX"-areas). Suitable up to 70 m/s (230 ft/s) of centrifugal speed. Up to 5 dB(A) sound deadening in terms of structural borne noise.

Applications

- fan blades / housings
- dust extraction systems or blowers
- pneumatic conveyors
- propellers / impellers / rotors

Reference

- professionally smooth to improve the aerodynamics
- can be applied in 2 colors on top of each other as an optical wear indicator
- adheres very well to light metals and special alloys



Conveyor Belts

MetaLine® Series 700 – **Elastomeric repair technology for worn rubber parts**

Professional elastomeric repair materials to be applied by troweling (ML 680) pouring or spraying (ML 760). For permanent longitudal cut repairs. Adhesion to most rubber substrates is beyond the cohesion of the rubber itself. Solvent-free & non-toxic, sustainable technology.

Applications

- steel cord conveyor belts
- fabric conveyor belts
- solid woven conveyor belts
- overcoating of mechanical belt fasteners

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Reference

- for permanent repairs – no quick fixes without time and preparation
- recommissioning after 12 hours at 20 °C (68 °F) at the earliest
- more wear resistant and durable than any original conveyor belt quality

Floating Hoses

MetaLine® Series 700 – **Service-life extension for bulk cargo handling**

Castable, trowelable and sprayable repair compounds. Can be applied in thick coats overhead or on vertical surfaces. Reduces fouling and maritime growth. Resistant to environmental and marine impact. Ultra wear resistant to cover dredging and mining demands.

Applications

- hard rubber linings
- soft rubber linings
- natural rubber linings
- polyurethane linings
- polyurea linings

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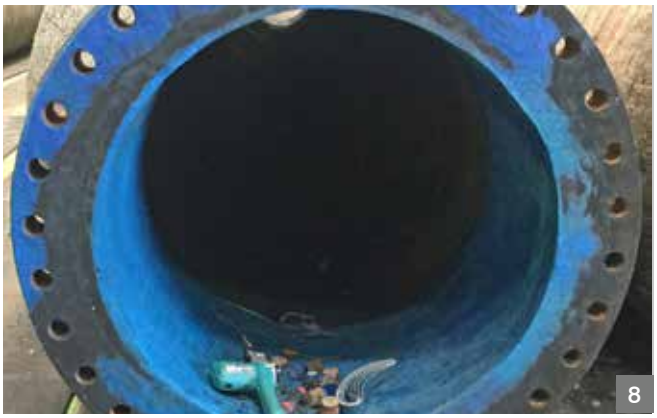
8

Reference

- injectable to combat cracks and hard to reach failures
- suitable for structures subjected to massive bending forces (pic. 5)
- bonds extremely well to almost all natural rubber formulations

Rubber equipment spares

MetaLine® Series 700 – **Cost reduction & environmental protection for rubber repairs**

The environmental impact of mining is substantial, especially when it comes to rubber parts. The lack of repair technology leads to a massive loss of resources and an unacceptable pollution of the landscape. MetaLine® Series 700 brings worn rubber equipment back into service. In most cases with lower costs and a higher lifetime expectancy, like in this particular repair case:

spare part costs	1,750.- EUR
repair costs	800.- EUR
repair time	6 hours
consumption	5 cartridges ML 785
expected lifetime	double as spare-part
other savings	1 x disassembly & operational shut down

References and Photos: Carmen Copper Corporation (Mining) Toledo, Philippines

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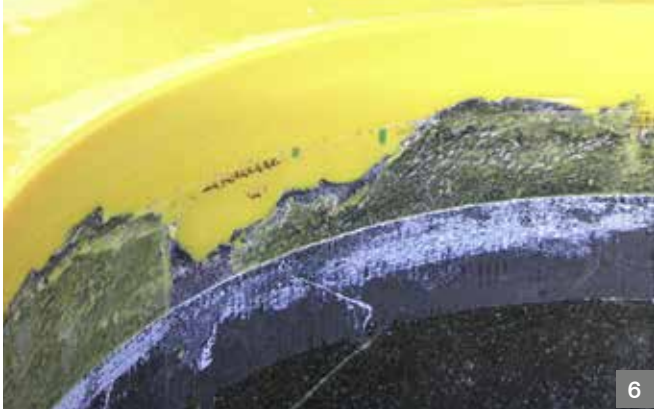
6

Reference

- saves resources, avoids waste and is a signal for the necessary rethinking in mining
- more wear resistant than natural rubber but with lower chemical resistances
- lighter than rubber and thus additionally energy-saving

Technical Data

MetaLine® Series 700 – ultra dynamic responding spray-applied elastomers

	MetaLine® 760	MetaLine® 785	MetaLine® 795
Prefered usage (multi-purpose use is possible)	shock absorption rubber repairs noise deadening slip resistance	wear protection erosion protection cavitation protection electrical insulation	fouling release non-stick character corrosion protection fluid flow efficiency increase
Processing spraying / casting / injecting	APPLICATOR S-700 high pressure / low pressure	APPLICATOR S-700 high pressure / low pressure	APPLICATOR S-700 high pressure / low pressure
Solids content DIN EN ISO 3251	100 % by weight / volume no solvent / zero VOC	100 % by weight / volume no solvent / zero VOC	100 % by weight / volume no solvent / zero VOC
Mixing ratio cartridge based application process	2 : 1 by volume	2 : 1 by volume	2 : 1 by volume
Consumption theoretically per mm (40 mils) film thickness	1.25 kg/m² 0.25 lbs/ft²	1.20 kg/m² 0.24 lbs/ft²	1.20 kg/m² 0.24 lbs/ft²
Processing time at 60 °C (140 °F) material temperature	7 minutes	1 minute	1 minute
Solidification at 20 °C (68 °F) – dependent on stress	> 1.5 days	> 1 day	> 1 day
Hardness A.S.T.M. D2240-68	60 Shore A sprayed 65 Shore A casted	82 Shore A sprayed 85 Shore A casted	95 Shore A sprayed 98 Shore A casted
Density DIN EN ISO 1183-2	1.10 g/cm³ 0.039 lb/in³	1.05 g/cm³ 0.038 lb/in³	1.05 g/cm³ 0.038 lb/in³
Pull-off adhesion strength A.S.T.M. D4541	> 15 N/mm² (Steel S235JR) > 2,175 psi (Steel ASTM A36)	> 15 N/mm² (Steel S235JR) > 2,175 psi (Steel ASTM A36)	> 15 N/mm² (Steel S235JR) > 2,175 psi (Steel ASTM A36)
Tensile strength A.S.T.M. D412-16	20 N/mm² 2,900 psi	20 N/mm² 2,900 psi	24 N/mm² 3,480 psi
Tensile modulus at 100 % elongation A.S.T.M. D412-16	6 N/mm² 870 psi	7 N/mm² 1,015 psi	13 N/mm² 1,885 psi
Tear resistance DIN 53 515	68 N/mm 388 pound/inch	55 N/mm 314 pound/inch	68 N/mm 388 pound/inch
Elongation at break A.S.T.M. D412-16	650 %	380 %	275 %
Bashore resilience DIN 53 512	63 %	45 %	27 %
Coefficient of thermal conductivity ISO 8302	0.2 W/K · m 0.11 BTU/h · ft · °F	0.2 W/K · m 0.11 BTU/h · ft · °F	0.2 W/K · m 0.11 BTU/h · ft · °F
Dielectric surface resistivity DIN EN 62631	> 7 x 10^{10} Ohm	> 7 x 10^{10} Ohm	> 7 x 10^{10} Ohm
Dielectric breakdown voltage DIN EN 60243	> 5,000 Volts/mm	> 5,000 Volts/mm	> 5,000 Volts/mm
High temperature resistance above water / under water	+ 100 °C / 212 °F dry + 60 °C / 140 °F wet	+ 120 °C / 248 °F dry + 60 °C / 140 °F wet	+ 120 °C / 248 °F dry + 60 °C / 140 °F wet
Low temperature resistance dry	- 50 °C - 58 °F	- 50 °C - 58 °F	- 50 °C - 58 °F
Linear abrasion (Taber®) A.S.T.M. D4060, H-22, dry, 1 kg, 1,000 revolutions	n.a. n.a.	8.2 mg 0.12 grain	10.5 mg 0.16 grain
Dynamic abrasion DIN ISO 4649	85 mm³ 0.005 in³	55 mm³ 0.003 in³	65 mm³ 0.004 in³
Coefficient of static friction DIN EN ISO 8295	$\mu(0)$ = approx. 0.7	$\mu(0)$ = approx. 0.6	$\mu(0)$ = approx. 0.15
Approvals (dry) pharma & food conformity	FDA 177.1680 (21) EU 1935/2004	FDA 177.1680 (21) EU 1935/2004	FDA 177.1680 (21) EU 1935/2004
Approvals (wet) drinking (potable) water conformity		BS 6920 Part 2.6 AS/NZS 4020:2005	
Purity formulation being free off	no free isocyanate no polyurea, no silicone	no free isocyanate no polyurea, no silicone	no free isocyanate no polyurea, no silicone

Cost Effectiveness

And what about the cost effectiveness?

MetaLine® is often more efficient and cost-effective than OEM replacement parts and longer lasting than other means of repair. When comparing prices with conventional synthetic repair methods (such as epoxy-ceramic or trowelable rubber repair grouts) the MetaLine® technology is impressive, providing **cost savings of up to 60 %.** For example, 1 kg (2.2 lbs) of MetaLine® Series 700 covers almost 1 m² (10.7 sqft) in a thickness of 1 mm (40 mils). For an identical coverage of epoxy-ceramic, more than 2 kg (4.4 lbs) would be required!

For start-up users, we recommend the **MetaLine® Onboard-Kit.** This fully equipped set comes with:

- stable aluminium transport box
- SP-1 blasting gun and blasting grit
- Applicator S-700
- spare nozzles
- cleaning agent
- primers for metal and rubber
- Series 700 coating product
- mixing tools and brushes
- disposable gloves
- masking tapes
- detailed **Processing Instructions**

The MetaLine® Onboard-Kit is complete & ready to start at any time at any place. Surface preparation, cleaning, masking, spray-equipment, coating material – all in one. Shelf life about 2 years.

MetaLine® – by professionals for professionals ...

Training your crew!

We support your crew during the technical implementation of our coatings.

A MetaLine® trainer will instruct your team regarding the realization of professional repairs – in many different languages and almost **any place in the world**! Alternatively, you may also send your employees to our German training center to attend a certified training session there.

For us it is very important that **your crew** achieve solid and reliable results. Therefore, we offer you our experience, our advice and our proven support.

MetaLine® encompasses a lot more than just the sale of products ... you may take our word for this!

MADE IN GERMANY
60 YEARS OF EXPERIENCE

MetaLine®.com

surface protection

corrosion-resistant
permanently elastic
abrasion & erosion-resistant
sprayable and moldable
shock-absorbing
glide-enhancing or
slip-resistant

Simply trust MetaLine's "Engineering Made in Germany"!

You will find MetaLine® products being used in various industries such as:

- Aeronautical Engineering
- Automation Technology
- Automotive Manufacturing
- Ceramics Industry
- Chemical Industry
- Concrete Production
- Conveyor Technology
- Electrical Engineering
- Fertilizer Production
- Foodstuff Processing
- Glass Processing
- Metal Foundries
- Municipal Technology
- Nautical
- Occupational Safety
- Offshore & Marine
- Packaging Technology
- Petro-Chemical
- Pharmaceuticals
- Plastics Processing
- Power Plant Technology
- Pulp & Paper
- Recycling Technology
- Surface Technology
- Textile Machinery Design
- Hydrowater

... and many more

protect | repair | save | cover | improve

K-700 Mining (EN), August 2023

MetaLine Surface Protection GmbH | DE-71157 Hildrizhausen (Germany) | Robert-Bosch-Str. 5-11
Tel. +49 (0)7034 3100-0 | Fax +49 (0)7034 3100-5 | www.metaline.com | info@metaline.de

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