

Elastomeric repair coatings offering long-term protection against erosion, corrosion, cavitation and wear

MetaLine® Series 700 Cartridge Spray Coating

. . . the new dimension in repair technology after 50 years of brush-applied epoxy-ceramic



A leading technology of the world - made in Germany



MetaLine® Series 700

Rubberlike, sprayable wear protective coatings to solve erosion, corrosion and cavitation problems on-board

*More than 50 years of surface protection experience at MetaLine has led to **Series 700** - a product line combining the wear and tear resistance of rubber with the simple processing of epoxy-ceramics. Exceptional lifetime improvements are the result! In interaction with the novel cartridge spray processing: a **milestone** in the long-term protection of metallic structures!*

Natural rubber is a proven wear and corrosion protection material. However, with **seams** that tend to fail, its limited repairability and the massive equipment need for field vulcanisation. Rapid on-site lining is simply not possible. In case of repairs, quite often epoxy-ceramic blends are used instead. However, replacing soft rubber with semihard plastic-based compounds is an unreliable approach . . .

MetaLine Series 700 is an elastomeric coating system that offers a far superior solution. It combines rubber quality features with a novel spray application technique based on cartridge processing. Using this technology, it is possible to apply **sprayable elastomeric wear protective coatings** directly on-board, professionally, rapidly and **seamlessly**. The product is based on a special PUR-Elastomer technology that does not require hot vulcanisation.

The MetaLine cartridge spray gun mixes the product automatically and sprays it on. A hydrodynamic resistant protective coating is created which develops an **erosion and cavitation resistance** so far not achieved. The dynamic wear resistance is exceeded by **up to 50 times** (*) compared to high-end epoxy-ceramics!

MetaLine Series 700 is extremely convincing owing to its professional spray application as well as the extraordinary **surface smoothness** and resultant improvement in **flow efficiency**. Efficiency increases of up to 3.5% can be expected.

This unique process is suitable for the entire protection of metal components as well as for the partial repair of existing rubber linings or parts.

Time savings

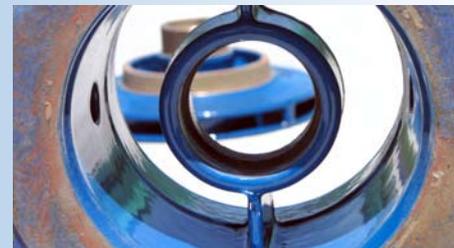
Performance improvement

Lifetime extension

Cost reduction



The daily repair routine when epoxy-ceramic compounds are brush applied. No hydraulic engineer wants to see irregular surfaces like this . . .



What a difference - MetaLine surfaces are smoother than any steel casting and about 500 % more wear-resistant compared to mild steel () . . .*

**) Proven by independent research laboratories and OEM pump manufacturers such as KSB AG (Technik kompakt, 12/2004) or ANDRITZ AG*



Case Studies

MetaLine Series 700

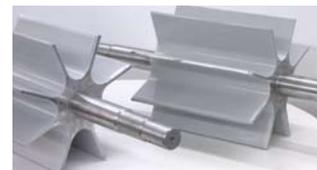
MetaLine Series 700 is used, amongst others, on board the following container ships, bulk carriers, car ferries or fishing vessels:

Vessel *Cormone*
Vessel *Togo*
Vessel *St. Anna*
Vessel *Berge Danuta*
Vessel *Toronto*
Vessel *Hanjin Amsterdam*
Vessel *Independent Accord*
Vessel *Logos Hope*
Vessel *Antonio Nores*
Vessel *Hermigon*
Vessel *Anapurna*
Vessel *Tsingtao Express*
Vessel *Santa Rosanna*
Vessel *Conti Canberra*
Vessel *Wellington Express*
Vessel *Hans-Günther Bülow*
Vessel *Antje Wulff*
Vessel *Ilse Wulff*
Vessel *John Wulff*
Vessel *Johannes Wulff*
Vessel *Manuela Wulff*
Vessel *Hermann Wulff*
Vessel *Weserwolf*
Vessel *Elbwolf*
Vessel *Caroline Russ*
Vessel *Paul Russ*
Vessel *Jansum*
Vessel *Suse*
Vessel *CMA CGM Comoe*
Vessel *Maya Rickmers*
Vessel *Albert Rickmers*
Vessel *Alexandra Rickmers*
Vessel *Alice Rickmers*
Vessel *Denderah Rickmers*
Vessel *Vicki Rickmers*
Vessel *Patricia Rickmers*
Vessel *Cathrine Rickmers*
Vessel *Pacific Resolution*
Vessel *Sabine Rickmers*
Vessel *Marine Rickmers*
Vessel *Sean Rickmers*
Vessel *Willy Rickmers*
Vessel *Rickmers Antwerp*
Vessel *Rickmers Seoul*
Vessel *RT Claire*
Vessel *Conti Equator*
Vessel *Hanjin Amsterdam*
Vessel *MSC Firenze*
Vessel *E.R. Denver*
Vessel *E.R. Savannah*
Vessel *E.R. Dallas*
Vessel *E.R. Beijing*
Vessel *E.R. Berlin*
Vessel *E.R. Kobe*
Vessel *E.R. Santiago*
Vessel *E.R. Felixstowe*
Vessel *E.R. Amsterdam*
Vessel *E.R. Canada*
Vessel *E.R. India*
Vessel *E.R. Los Angeles*
Vessel *E.R. Shenzhen*
Vessel *E.R. Vittoria*
Vessel *E.R. Arendal*
Vessel *Maersk Sofia*
Vessel *MOL Devotion*
Vessel *MOL Delight*
Vessel *MOL Dominance*
Vessel *Titan Glory*
Vessel *Callisto Glory*
Vessel *Nedlloyd Marita*
Vessel *Nedlloyd Juliana*
Vessel *Marita Star*
...

MetaLine® Series 700

novel wear protective coating system to repair damaged rubber parts or to realise elastomeric in-situ linings of metal structures

- cooling water pumps
- seawater pipes
- ballast water treatment systems
- rudder blades
- seawater filters / strainers
- thusters and nozzles
- ship propellers
- stabilisers
- shaft brackets
- offshore splash zone protection
- hatch seals
- firefighting equipment
- pipe floats
- dredger pumps und chutes
- valves / fittings
- sewage treatment systems
- submarine antennas
- aluminium hulls / decks / walls
- food cold storage cells
- fish processing areas
- buoys / fenders
- ducts
- tidal turbines
- lock gate seals
- bulwarks
- fins / keels
- anchor pockets & chain lockers
- jetski & watersports equipment



**Lloyd's Register EMEA
examined in 10/2013**

metaline.com

Corrosion Protection

MetaLine Series 700



Seawater- Piping

Sprayable elastomeric coatings to reline used piping systems or for the initial treatment of new tubing. Particularly suitable for installations suffering from severe impact and abrasion

- pipes (starting at 50 mm diameter)
- curved or straight tubes
- flange coatings
- ballast water treatment systems
- ballast water piping
- seawater inlets



- 1 *MetaLine offers smooth surfaces - even on corroded parts*
- 2 *Seawater pipes during the spray coating at the drydock*
- 3 *Seawater inlet elastomerified with 2 mm MetaLine 785*
- 4 *Proven rubberlike spray solutions for curved / contorted pipes*
- 5 *Internal flexible pipe coating including all flange areas*
- 6 *Seamless protection concept from the flange via the tube*

Life-time Extension

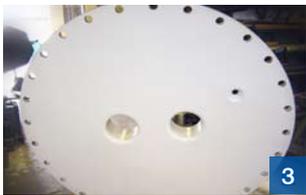
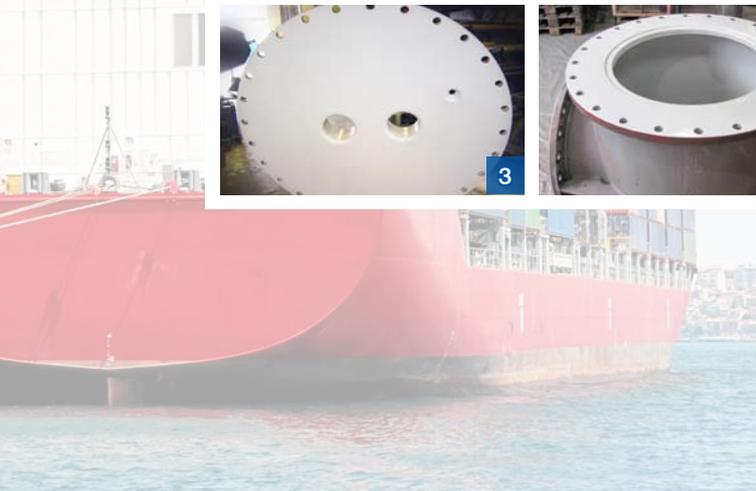
MetaLine Series 700



Filter / Strainers Water Treatment

Sprayable elastomeric coatings for the repair or complete re-lining of maritime filter equipment. Seamless homogenous rubber-like character. Fully closed coating concept starting from the complete interior up to the outer flanges

- strainer bodies
- strainer covers
- ballast water treatment reactors
- wastewater purification systems
- desalination equipment



- 1 *MetaLine 785 coated strainers prior to installation*
- 2 *Seamless elastomeric spray lining of a used strainer*
- 3 *More resistant than rubber - the MetaLine elastomeric coatings*
- 4 *Resistant due to an integrated borderline anti-corrosion primer*
- 5 *Seawater filters with a 2-3 mm MetaLine liquid rubber lining*
- 6 *Coated ballast water treatment reactor waiting for assembly*

Erosion Protection

MetaLine Series 700



Pumps / Rotary Valves

Sprayable elastomeric coatings to refurbish worn parts or for the preventive maintenance of new equipment. Extremely resistant to erosion, cavitation and corrosion

- open impellers
- closed impellers
- spiral pump casings
- split case pumps
- submersible pumps
- vacuum pumps
- rotary valves
- cooling water pumps
- wastewater pumps



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- 1 Seamless rubberlike lining for maximum erosion protection
- 2 Elastomeric heavy duty wear protection for pump casings
- 3 MetaLine 785 protects wastewater pumps on cruise ships
- 4 No matter what size - MetaLine has hardly any restrictions
- 5 Saltwater corrosion protection with long-term warranty
- 6 Tested and proven for any size of pumping systems

Wear Protection

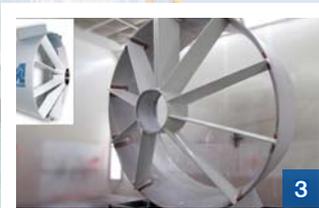
MetaLine Series 700



Propulsion-Drives

Sprayable elastomeric coatings to protect against impact and high-fluid flow forces. These rubberlike linings create a completely seamless and extremely smooth surface which provides increased efficiency

- propulsion systems
- kort nozzles
- thrusters
- Z- / L-Drives
- jet propulsion drives
- Voith-Schneider® propellers



- 1 *MetaLine's elastomeric technology – no chance for impact*
- 2 *Smooth surfaces to fight against cavitation and turbulence*
- 3 *MetaLine coatings – designed for immersion purposes*
- 4 *Electrical insulation properties prevent galvanic corrosion*
- 5 *Fluid flow, performance & cost optimisation with MetaLine*
- 6 *State-of-the-art seamless elastomeric spraylinings*

Impact Protection

MetaLine Series 700



On-Deck-Applications

Sprayable, decorative elastomeric coatings to enhance slip protection on board. The seamless and smooth film finish promotes cleanability as well as improving hygiene for food processing and storage

- food fridge areas
- fish processing areas
- fishnet weights
- rescue equipment
- helicopter flight decks
- skirting boards
- bulwarks
- shackles
- handrails / handles
- rope-end sealing



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- 1 Impact-resistant long-lasting on-deck corrosion protection
- 2 Fish processing areas & cold storage cells covered seamlessly
- 3 Elastomeric saltwater protection for the Offshore & Navy
- 4 A safe technology at sea - sprayed rubberlike properties
- 5 Bulwarks, anchor lockers, hatches with sound-deadening spraylining
- 6 Decorative sliding protection on steps, bathing ladders, gangways ...

Cavitation Protection

MetaLine Series 700



Rudder-Systems

Trowelable or sprayable elastomeric repair compounds to resurface worn metallic structures. Applicable in every desired thickness. Highly elastic and extremely resistant against severe cavitation forces

- rudder horns
- rudder blades
- side thrusters
- retractable fin stabilisers
- bilge keels



- 1 *MetaLine - feels at home in highly abused areas*
- 2 *Rudder with a final topcoat after MetaLine 785 partial coating*
- 3 *MetaLine in dry-dock operation - no vulcanisation required*
- 4 *Seamless and tensionless elastomeric lining on-site*
- 5 *Reconstruction of the missing structure and preventive protection*
- 6 *High-tech engineering and cost savings "Made in Germany"*

Non-Stick Properties

MetaLine Series 700



Valves / Fittings / Tubing

Sprayable elastomeric coatings to protect the interior and exterior against saltwater corrosion. Resists chemical exposure within a pH range between 3 and 11. Non-stick characteristics are present. Available in 7 different colours

- butterfly valves
- stop valves
- compensators
- spigots
- throttle valves
- gaiters
- fireplugs
- fire-extinguishing water supply pipes



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- 1 Large valve after elastomerisation with MetaLine 785
- 2 Firefighting systems during the protective coating process
- 3 Even stainless steel can be improved with MetaLine . . .
- 4 2 mm MetaLine 785 elastomeric lining inside this ball valve
- 5 Slurry stop valve after overhaul with MetaLine products
- 6 Saltwater valve fully encapsulated with MetaLine 795

Surface Protection

MetaLine Series 700



Propellers Subsea Systems

Sprayable elastomeric coatings to protect against cavitation, bio-corrosion and fouling. Low weight material characteristic with a density of 1.05 g/cm³. Tensionless high bond to many different substrates. Changes the underwater signature of subsea operating vessels

- sportboat propellers
- steven systems
- ship propellers
- controllable-pitch propellers
- submarine screws
- submarine antennas
- submarine rubber hull repairs
- tidal turbines



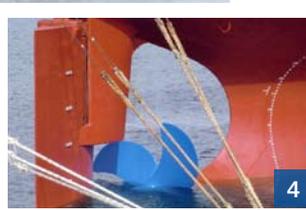
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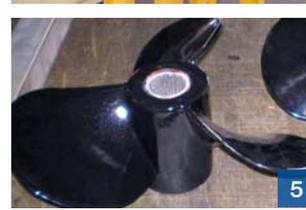
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- 1 *MetaLine changes the signature of subsea equipment*
- 2 *Midsize ship propeller during the coating process*
- 3 *MetaLine – elastomeric linings without hot vulcanisation*
- 4 *This might be the future of maritime propulsion protection . . .*
- 5 *Rubberlike coated aluminium propeller - suitable for saltwater*
- 6 *MetaLine coated steven bracket on a coast patrol boat*

Spares Recycling

MetaLine Series 700



Rubber / Foam-Repairs

Castable, trowelable and sprayable repair compounds with elastomeric properties. Applicable on vertical surfaces or overhead. Can be used as a liquid gasket for flange sealing. Sticks permanently to different kinds of substrates without hot vulcanisation

- vulcanised rubber linings
- liquid flange gaskets
- hatch cover seals
- submarine rubber hull repairs
- fenders / buoys
- lifting bags / leak sealing bags
- hovercrafts
- dinghies / zodiacs®
- lock gate seals



- 1 Rubber-lined strainer cover during the MetaLine in-situ repair
- 2 Red soft rubber lining partially repaired with black MetaLine 760
- 3 Not a problem for MetaLine - but a disaster for our competition
- 4 Repair of a floatable leak-sealing bag using MetaLine 760
- 5 Broken rubber impeller during MetaLine overhaul
- 6 Liquid sealing of a seawater treatment unit with MetaLine 785

Abrasion Protection

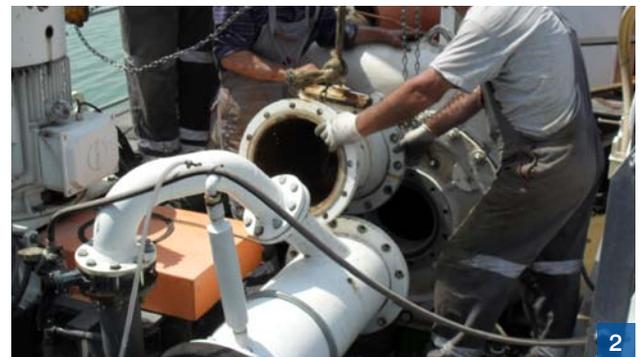
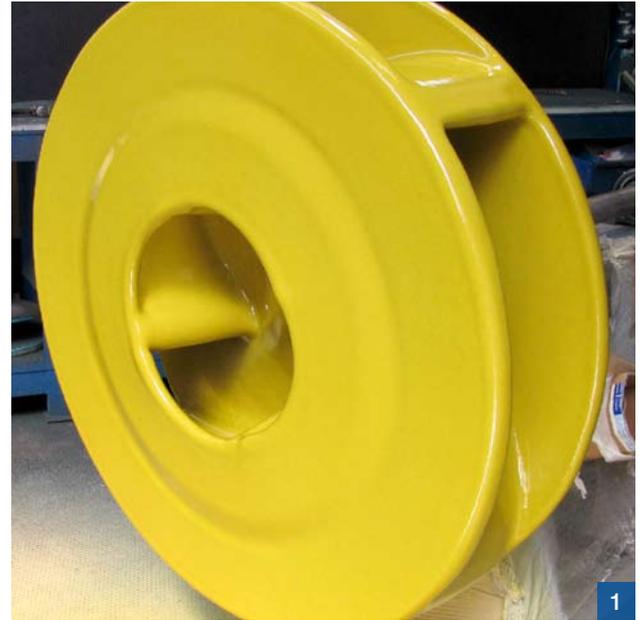
MetaLine Series 700



Exploitation Dredging

Sprayable elastomeric coatings to repair eroded metallic or rubber parts. Up to 50 times as resistant as epoxy-ceramic repair compounds. Suitable for sand and gravel up to 25 mm screening size

- pump impellers
- pump casings
- draft tubes
- suction strainers
- floating equipment
- floating pontoon
- barges



- 1 Dredging impeller with a 25 mm thick coating of MetaLine 785
- 2 Reinstallation of a MetaLine-coated dredging pump casing
- 3 Large pump casing protected with MetaLine 785
- 4 Elastomeric protection inside a longitudinally split elbow pipe
- 5 Repaired rubber floating pipe from gravel extraction
- 6 MetaLine offers flow-optimised, smooth pump geometries

Saltwater Protection

MetaLine Series 700



Water-Sports-Equipment

Brushable, trowelable or sprayable elastomeric products to repair or protect sensitive synthetic naval surfaces. A low coefficient of friction is available in order to ease launching and retrieving of sports equipment

- jetskis
- kayaks / canoes
- diving equipment
- aluminium hulls
- seats / benches
- bilge sealings
- centreboards / keels
- anchor lockers
- bathing ladders / gangways
- slipways
- boat trailers
- rental equipment



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- 1 Life enhancement and value preservation for boat owners
- 2 Marine growth takes place - the difference is easy removal
- 3 Repair / renewal coating of PE-foam rental equipment
- 4 Aluminum floating equipment coated with "liquid rubber"
- 5 Glide-enhancing coating to ease retrieval of water jets
- 6 Impact-resistant sealing & scratch protection beneath the water line