

# MetaLine®.com

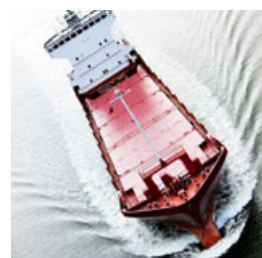
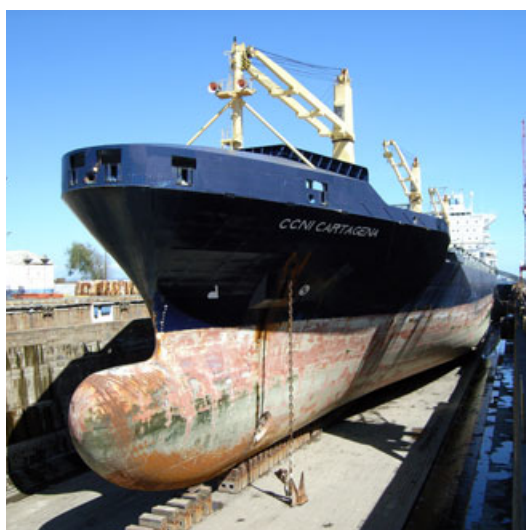
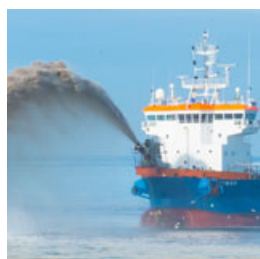
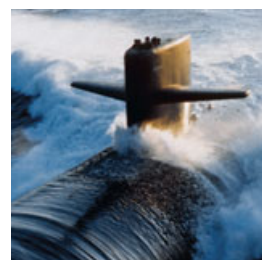
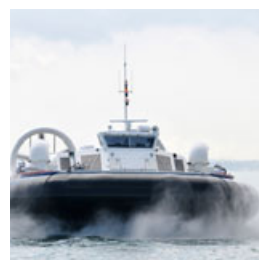
surface protection

## Marine and Maritime Technologies

Offshore, Hydraulic Engineering, Subsea, Cruises,  
Fishing Industry and Water Sports

## MetaLine® Series 700

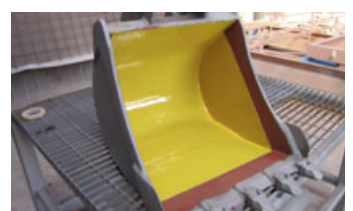
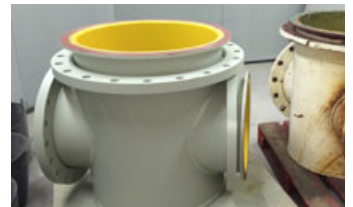
**Sprayable, Elastomeric Repair Systems  
and Protective Coatings  
against erosion, corrosion,  
cavitation and wear**



Equipment Life: Extended. Since 1960 – Made in Germany

**MetaLine® Series 700**  
Rubberlike Protection Technology  
for the repair of damaged rubber  
linings and elastomeric in-situ  
coatings of metal structures

**Wear protection**  
**Erosion protection**  
**Cavitation protection**  
**Corrosion protection**  
**Non-stick function**  
**Shock absorption**  
**Noise deadening**  
**Anti-Fouling**



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# MetaLine® Series 700

**Rubber-like sprayable wear protection to solve erosion, corrosion, and wear problems directly on-board**

Rubber is a proven wear and corrosion protection technology, however, with seams that can fail, restricted reparability, and its equipment need for vulcanization, rapid in-situ lining is generally not possible. Epoxy ceramic products are often used when repairs need to be made, but replacing rubber with plastic based composites is a questionable approach for an effective repair ...

**MetaLine Series 700** is an elastomeric product that combines the efficiency and performance of vulcanized rubber coatings and the simple processing of polymerics with the resistance of duplex steel. Additionally, our innovative Cartridge Spray Application (a breakthrough for the long-term protection of metal structures!) allows the product to be directly applied on-site seamlessly, rapidly, and professionally.

By means of the MetaLine APPLICATOR S-700, the cartridge packaged polymer is mixed and sprayed simultaneously. The result is a hydrodynamic resistant protective coating that provides unparalleled erosion resistance. Its durability is several times higher in comparison with conventional wear protective rubber linings!

**MetaLine Series 700** technology is unique because of its simple spray application process, extraordinary surface smoothness, and resultant improvement in flow dynamics. Efficiency increases of up to 3.5 % have been proven.

The MetaLine process is suitable for the protection of complete metal components as well as the repair of existing rubber linings & parts.



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



... and that's the way it should be! The **MetaLine resurfacing technology** are smoother than any steel casting and about 500 % more wear-resistant compared to mild steel. Repairs extending the durability of original spare parts and offering lower maintenance costs.

## For more than 50 years

MetaLine looks back on more than 50 years of experience when it comes to repairing, protecting, and maintaining stressed equipment. Our products have become OEM (Original Equipment Manufacturer) Standard in many different industries.

When handling our coating materials, we place great importance on expert instruction, customer communication, and Know-How-Transfer. To realize this objective, we offer periods of instruction that range from one day to several days at our location or yours – worldwide! Video & project support is available at any time.

MetaLine has its headquarters located near Stuttgart (Southern Germany), and through our sales partners, we are represented in more than 70 countries.

**Our experienced trainers are at your disposal!**  
**Do not hesitate to contact us!**

**Corrosion-resistant**  
**Permanently elastic**  
**Abrasion & Erosion-resistant**  
**Sprayable and moldable**  
**Shock-absorbing**  
**Glide-enhancing or**  
**Slip-resistant**



## The Material Properties

**MetaLine Series 700** is a solvent-free two-component elastomer that can be applied by spraying, injection, or casting. Polymerization begins after 1 minute, so a coating thickness between 1 mm and 20 mm can be achieved without the material sagging, even on vertical surfaces. MetaLine Series 700 products can be used directly on-site in **almost any climatic conditions** (even in extremely high humidity/temperature).

MetaLine Series 700 adheres to **most substrates** including steel, alloys, aluminium, rubber, concrete, wood and many plastics. It is not necessary to heat the components to be coated. After 5 minutes the coating is dry to the touch and most treated parts can be put into service about 24 hours later (at 20 °C). The temperature resistance is between -50 °C and +100 °C, depending on the relevant application.

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

### MetaLine Series 700 is provided in 3 different degrees of hardness

- **MetaLine 760 (60 Shore A)** serves to repair soft rubber linings and conveyor belt / hatch cover seal maintenance
- **MetaLine 785 (85 Shore A)** is the first choice for the protection of components subjected to wear, erosion or cavitation
- **MetaLine 795 (95 Shore A)** develops non-stick properties. Its ultra low coefficient of static friction prevents material bridging, e.g. loading gates

MetaLine Series 700 coatings are **non-toxic**, safe to use, and have been assessed by US & EU authorities as drug and food-safe according to FDA standards and relevant EEC regulations.

The strength of MetaLine Series 700 lies in its erosion and cavitation resistance, which is comparable to high-alloy steels and armors. With a density of just 1.05 g/cm<sup>3</sup>, it is the **most lightweight duroplastic wear protection** available. The potential energy savings when applied to impellers and rotors is considerable.

## The Application Process



MetaLine APPLICATOR S-700 with Series 700 Double Cartridges

### Just 3 coatings steps!

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

- 1 Metal substrates are coated with MetaLine 924 first. This **electro-chemically active corrosion protection** prevents borderline penetration on coating edges and protects partially 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 professionals for professionals

- based on low-pressure technology (about 5 bars)
- only 200 liters of compressed air per minute required
- automatic dosing and mixing (no off-ratio)
- 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-site working atmospheres
- investment costs below 1,000 EUR

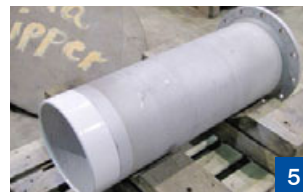
The APPLICATOR S-700 does not come into contact with the coating material itself, so the tool does not require any cleaning or maintenance after the job is done.

# 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

### Fields of application:

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



- 1 Proven rubberlike spray solutions for curved / contorted pipes
- 2 Seawater pipes during the spray coating at the drydock Lisnave, Portugal
- 3 Seawater inlet elastomerified with 2 mm MetaLine 785
- 4 MetaLine offers smooth surfaces – even on corroded parts
- 5 Internal elastic pipe coating including all flange areas
- 6 Seamless protection concept from the flange via the tube
- 7 Superior to rubber and less cost intensive as epoxy-ceramic compounds

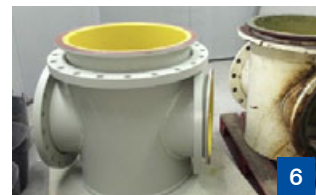
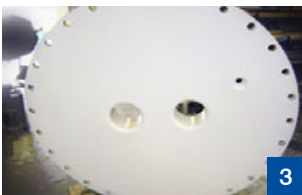
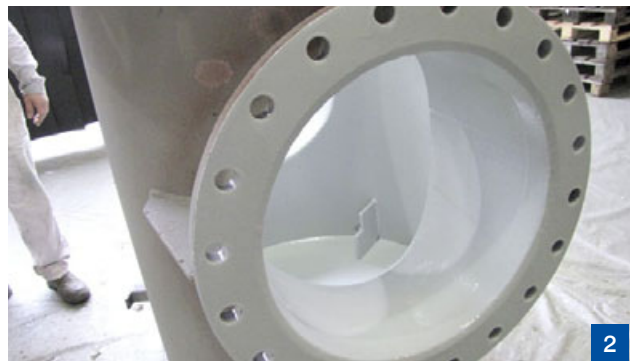
## Reference: Corrosion protection for seawater intake systems

### Filter / Strainers Water Treatment

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

#### Fields of application:

- strainer bodies
- strainer covers
- 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 part waiting for the final assembly
- 7 MetaLine 785 resists sandblasting and will survive the load in your strainer ...



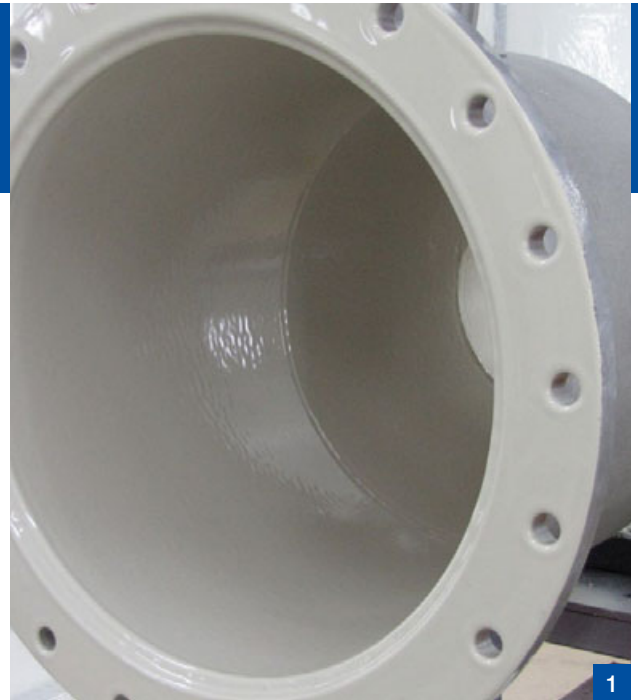
# BWT Reactors

The treatment of ballast water due to IMO standards – no matter if using active substances, cavitation, UV-light or whatsoever neutralization process – is a stressful demand for the reactor equipment.

MetaLine 785 is an approved coating solution to protect the reactor or its piping equipment. Furthermore the use of expensive saltwater-resistant stainless steel equipment can be minimized

### Fields of application:

- Ballast water reactors
- Ballast water pipes
- Ballast water pipe bends



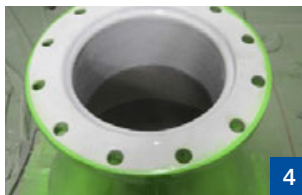
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- 1 Elastomeric characteristics help to meet the new IMO Standards
- 2 Whenever it comes to success, the MetaLine APPLICATOR S-700 is involved
- 3 Details of the nests where the cavitation cathodes are implemented
- 4 Showing the full lining concept – via the interior up to the flanges
- 5 MetaLine 785 coated pipes waiting for the final quality inspection
- 6 Ready to go and ready for the installation on board



# Hydraulic Steelworks

Colliding flotsam, climatic influences, ice floes in winter as well as atmospheric corrosion define the highest demand to surface protective coatings used in hydraulic steelworks.

MetaLine is an state of the art technology to increase service life. It sets benchmarks when it comes to elastomeric resistance and durability. A seamless, rubberlike, extremely well bonding long-term protection

### Suitable for:

- Water vanes
- Weirs
- Wicket gates
- Floodgates
- Bulkheads
- Hydropower Systems



- 1 Suitable for smaller & bigger surfaces – 2 mm MetaLine 785
- 2 80 m² surface perfectly desalinated, dried, blasted & degreased
- 3 Single coat application of MetaLine 924 Borderline Corrosion Protection
- 4 During spray application of MetaLine 900 Universal Primer
- 5 A fine selection of different nozzle types allow the use of MetaLine 785 even at hard to reach areas
- 6 Rubber mats protecting the primer in the walking area during the following coating work
- 7 Perfectly suited for working overhead – the MetaLine APPLICATOR S-700

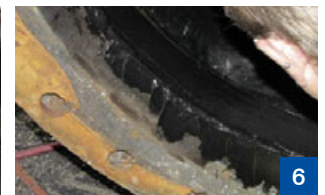
## Floating Hoses

Castable, trowelable, and sprayable repair compounds with permanent super-elastic characteristics. Can be applied in thick coats overhead or on vertical surfaces. Bonds very well to almost all industrially used rubber mixtures.

Designed to be applied under severe climatic conditions, even great heat or high atmospheric humidity. Reduces fouling and maritime growth. Resistant to environmental and marine impact. Ultra wear resistant to cover dredging and mining demands.

### Fields of application:

- Hard Rubber Linings
- Soft Rubber Linings
- Natural Rubber Linings
- Polyurethane Linings
- Polyurea Linings



- 1 Smoothly and perfectly to trowel – MetaLine 685
- 2 MetaLine is suitable for structures subjected to bending forces
- 3 A daily rubber repair demand – cracked linings
- 4 The prepared repair area masked with a reinforcement tape
- 5 Ready to go – after the application of only 1 kg MetaLine 785
- 6 MetaLine 685 applied in a single coat with 12 mm thickness
- 7 MetaLine preserves equipment values – inside and outside of floating hoses

# 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

### Fields of application:

- 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 as OEM solution
- 4 Elastomeric protection inside a longitudinally split elbow pipe
- 5 Repaired rubber floating pipe for sweetwater gravel extraction
- 6 MetaLine offers flow-optimized, smooth pump geometries
- 7 Dredging hose repaired to fight wear & tear, saltwater and UV-impact



# Onboard Rubber Repairs

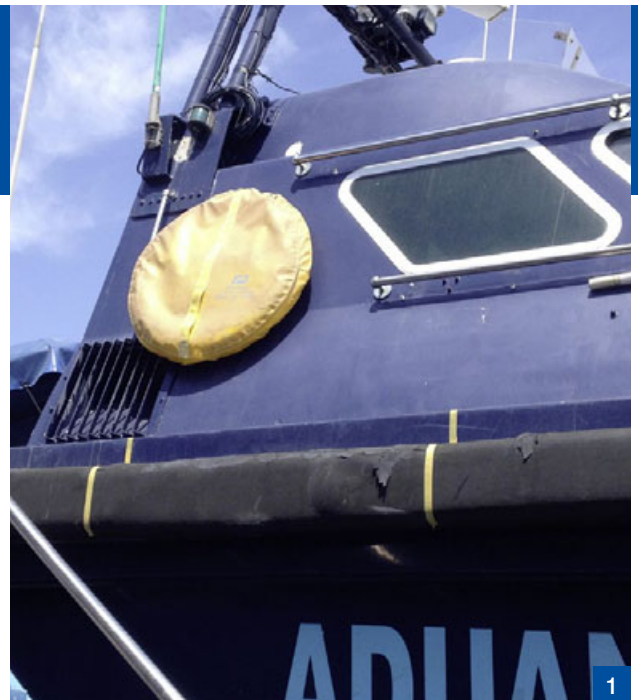
Castable, trowelable and sprayable repair systems for the daily maintenance of rubber parts being abused by UV-radiation and saltwater exposure. Suitable on deck and under deck.

Slip resistant or slip enhancing, signal tints or dead colors, very thin or extremely thick, smooth or textured, in every case better looking than natural rubber.

MetaLine Series 700 elastomeric coatings – a maritime rubber repair solution from professionals for professionals ...

### Fields of application:

- Skirt boards
- Impact bars
- Hatch cover seals



- 1 Skirt board porous, worn and with poor adhesion
- 2 Repaired with MetaLine 785 and overcoated with another 3 mm
- 3 Weight for tuna fishing nets coated with 10 mm MetaLine 785
- 4 Rubberized winches repaired with MetaLine 760
- 5 MetaLine - in practically each thickness & contour . . .
- 6 Skirt board made out of MetaLine 785 used in rescue boats
- 7 Elastomeric repair & sealing of some deck drains on a cruise ship

# Underwater Rubber Repairs

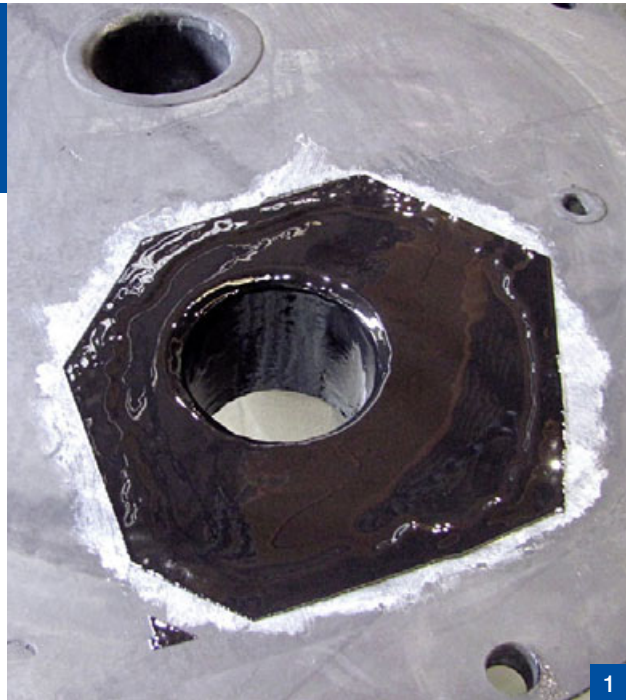
Castable, trowelable and sprayable repair compounds with elastomeric properties. Applicable on vertical surfaces or over-head.

More resistant as natural rubber. Suitable for soft and hard rubber

Can be used as a liquid gasket for flange sealing. Sticks permanently to different kinds of substrates without hot vulcanization

### Fields of application:

- vulcanized rubber linings
- liquid flange gaskets
- 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
- 7 An interesting combination – natural rubber being overcoated with MetaLine 785

# Gasket Repairs

Castable, trowelable and sprayable repair compounds for professional high-end repairs to rubber constructions. Pressure resistant, non-ageing and especially designed for the application to complicated surface geometries.

Fast cure properties allow a quick work realization and return back into service

### Fields of application:

- Seawater intake valves
- Valves / gates
- Hatch cover seals



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- 1 Seawater intake valve with several repair areas
- 2 A small damage but a great consequence – complete failure
- 3 That's all! A complete MetaLine 700 Repair Cartridge System
- 4 The prepared repair area. Masked with adhesive splicing tape
- 5 After the application of MetaLine and the tape removal
- 6 Grinded down to shape for a long service life – like new ...
- 7 Always the same principle process - no matter if for smaller or bigger parts



## Reference: Repair technology for rubber maintenance

### Tug repairs

Tug boat operation requires massive dampening characteristics and cushioning effects to secure safe manouvering. Some times the load is simply too high and rubber structures fail.

MetaLine Series 700 is made for repairs in extreme conditions – with an ultra low weight

#### Fields of application:

- All types of tug
- Pontoon protection
- Special corner fenders
- Ocean-going tugs
- Bridge and pile protection



Reference and photos:  
Tug Boat Sir Robert,  
Port of Tauranga, New Zealand

- 1 A complete breakdown and structural failure of this massive tug boat fender
- 2 Uninstallation of the tug fender in the port of Tauranga (New Zealand)
- 3 Mechanical surface preparation and masking of the not-to-touch areas
- 4 MetaLine 760 being used internally with a plug and externally for resurfacing
- 5 After completing the repair and prior reinstallation on board
- 6 About 100 tug operations later – in good shape and ready to operate

# 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

### Fields of application:

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



References and Movie/Photos:  
Maersk Nottingham

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

## Reference: Cavitation protection for propulsion equipment

### Kort Nozzles / Thrusters

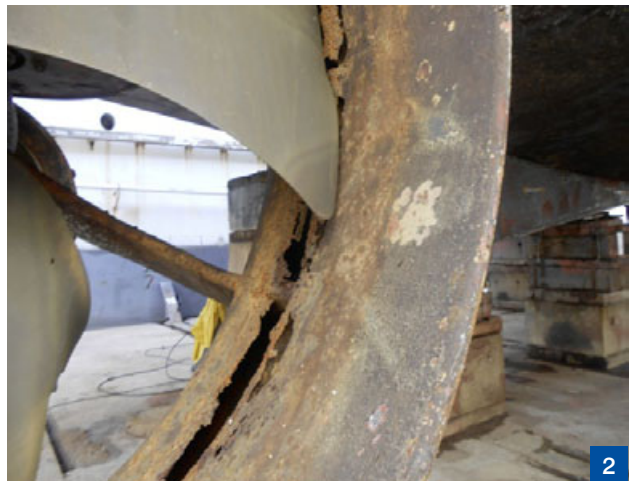
Tug boat operation is based on kort nozzle technology. Harsh working conditions demand the maximum from the thrusters!

Tremendous erosion and cavitation are typical problems causing regular repair demand. The basic goal should be to use an efficient protective coating system instead of useless paints or epoxy grouts.

MetaLine 785 is a wear resistant coating to increase the lifetime of thrusters and make their overhaul less time- and cost-intensive

#### Fields of application:

- Kort Nozzles rings
- Ropeguards



Photos:  
Niigata Thrusters on board the  
CMM OAXACA (Mexico)

- 1 Elastomeric MetaLine 785 has given new life to the nozzle ring
- 2 Both thrusters showed massive cavitation & erosion damages
- 3 After the reconstruction (welding) with new 13 mm steel plates
- 4 Gritblasting in tropical conditions like the Gulf of Mexico is a challenge. Air-dryers are a must to keep the surface moisture low
- 5 MetaLine 924 as a first borderline corrosion protection treatment
- 6 Ready to leave drydock after 2 days of professional coating work



## Reference: Cavitation protection for propulsion equipment

### Propellers Subsea Systems

Sprayable elastomeric coatings to protect against cavitation, bio-corrosion and fouling. Low weight material characteristic with a density of  $1.05 \text{ g/cm}^3$ . Tensionless high bond to many different substrates. Changes the underwater signature of subsea operating vessels

#### Fields of application:

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



- 1 MetaLine changes the signature of subsea equipment
- 2 Midsize ship propeller during the coating process
- 3 MetaLine – elastomeric linings do not require hot vulcanization
- 4 This might be the future of luxury vessel propulsion protection ...
- 5 Rubberlike coated aluminium propeller – suitable for saltwater
- 6 MetaLine coated steven bracket on a coast patrol boat
- 7 ICCP cathodic protection is enhanced and secured

# 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

### Fields of application:

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



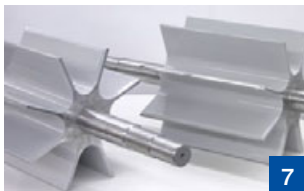
- 1 MetaLine – feels at home in highly abused areas
- 2 MetaLine in dry-dock operation – no vulcanization required
- 3 Seamless and tensionless elastomeric lining on-site
- 4 Rudder with a final topcoat after MetaLine 785 partial coating
- 5 Double rudder cavitation protection for a FREMM multipurpose frigate
- 6 The FREMM NORMANDIE on full speed again after a MetaLine Treatment
- 7 Reconstruction of the missing structure and preventive protection
- 8 Cost-optimized problem solutions „made in Germany“

# 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

### Fields of application:

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



- 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
- 7 Dry & wet material feeding is the main focus of MetaLine



### 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 colors

#### Fields of application:

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



- 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
- 7 MetaLine is non-toxic in use – however a protective mask should be worn anytime

### 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

#### Fields of application:

- 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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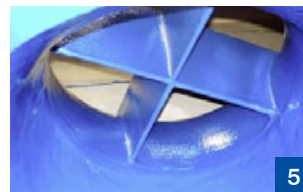
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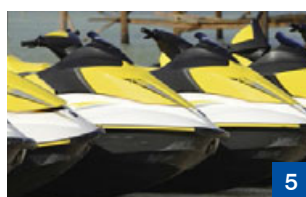
- 1 Impact-resistant long-lasting on-deck corrosion protection
- 2 Fish processing areas & cold storage cells covered seamlessly
- 3 Elastomeric saltwater protection for the Offshore & Navy
- 4 A safe technology at sea – sprayed rubberlike properties to enhance lifetime
- 5 Bulwarks, anchor lockers, hatches with sound-deadening spray lining
- 6 Decorative slip protection on steps, bathing ladders, gangways ...
- 7 Off-shore exploitation service equipment requires durability – ask MetaLine

# Watersports 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

### Fields of application:

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



- 1 Life enhancement and value preservation for boat owners
- 2 Marine growth takes place – but 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
- 7 MetaLine increases the lifetime of propellers but not their efficiency



## Reference: Ships and vessels

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



Albert Rickmers  
Alexandra Rickmers  
Alice Rickmers  
Antje Wulff  
AS Victoria  
AS Vincentia  
AS Virginia  
Avalon  
Balthasar Schulte  
**BENCHIJIGUA EXPRESS**  
Boavista  
BRITISH CORMORANT  
British Falcon  
British Kestrel  
British Robin  
BRITISH SAPPHIRE  
Callisto Glory  
Caroline Russ  
Cathrine Rickmers  
Cheick el Mokrani  
CMA CGM Carmen  
CMA CGM Don Carlos

CMA CGM Don Giovanni  
CMA CGM Don Giovanni  
CMA CGM Faust  
CMA CGM Jade  
CMA CGM Parsifal  
Conti Equator  
Cosco China  
CPO India

Hanjin Amsterdam  
Hermann Wulff  
Ilse Wulff  
Independent Accord  
Jansum  
Johannes Wulff  
John Wulff  
LNG Gemini  
LNG Lagos  
LNG Wilgas  
Logos Hope  
Maersk Edinburgh  
Maersk Montana  
Maple Ace II  
Marine Rickmers  
Marta Schulte

MOL Delight  
MOL Devotion  
MOL Dominance  
MSC Bendetta  
MSC Brianna  
MSC Firenze  
MSC Florida  
MSC Geneva  
MSC Gina  
MSC Irene

Aenne Rickmers  
Anapurna  
Andre Rickmers  
Andreas  
Anglia  
Annegret  
Annette  
Antonio Nores  
Asiatic Wind  
Bahama Spirit  
Botnia  
Chopin  
CMA CGM Azure  
CMA CGM Onyx  
Conti Canberra  
Cormone

CSAV Catabrian  
Deike Rickmers  
E.R. Athina  
E.R. Dallas  
E.R. Amsterdam  
E.R. Arendal  
E.R. Beijing  
E.R. Bergen  
E.R. Berlin  
E.R. Canada  
E.R. Denver  
E.R. Felixstowe  
E.R. India  
E.R. Kobe  
E.R. Kristiansand  
E.R. Los Angeles  
E.R. Santiago  
E.R. Savannah  
E.R. Shenzhen  
E.R. Vittoria  
Eilbeck  
Excelsior  
Hanjin Amsterdam  
Hans-Günther Bülow  
Helene Rickmers  
Hermigon  
Honourable Henry Jackmann  
India Rickmers  
Lavender  
Maersk Nottingham  
Maersk Seoul  
Maersk Sofia  
Maersk Valentina  
Maja Rickmers  
Manuela Wulff  
Marita Star  
Merkur Star  
MOL Dedication  
MOL Destiny  
Nedlloyd Juliana  
Nedlloyd Marita  
Nedlloyd Valentina



# Marine Classification

**MetaLine actually has “letters of non-objective” (white papers) of 2 leading classification organizations, confirming that no principle classification of MetaLine is needed:**

Northern Grandour  
Pacific Resolution  
Rickmer Rickmers  
Rickmers Singapore  
Rio Teslin  
Robert Rickmers  
RT Claire  
Santa Fiorenca  
Santa Rosanna  
Santa Rufina  
Thomson Dream  
Tilly Russ  
Togo  
Uni Promote  
Vicki Rickmers  
Weser Stahl  
Westwood Pacific  
Wiebke  
Ningpo  
Oaxaca  
Pacific Jewel  
Passat Euro Max  
Passat Spring  
Passat Summer  
Patricia Rickmers  
Paul Russ GmbH  
RHL Aqua  
RHL Audacia  
RHL Concordia  
Rickmers Antwerp  
Rickmers Soul  
Sea Danuta  
Spirit of Bangkok  
St. Annstrand  
Suse  
Titan Glory  
Toronto  
Tsingtao Express  
Wellington Express  
Weserwolf  
Willi  
...

“ ...

10. October 2013

## **Subject: METALINE 700**

This is to confirm that Lloyd's register EMEA is of the opinion that this type of material is not liable for either materials approval or Type Approval.

The use of repair and refurbishment materials is considered on a case by case basis and is dependent on numerous factors which would preclude a Type Approval of this product.

...”

“ ...

Monday, 18. August 2014



Dear Mr. Fleischer,  
Careful attention has been given to your request of how to proceed to obtain “Product Design Assess-

ment” certification for the “MetaLine 785/795” products and in this regard we have discussed your submitted documentation/information with our London based Materials Section.

While we note that Metaline 785/795 are PU spray coatings please be informed that coatings **in general are not a class requirement** but, when used as repair tools then an assessment would be required on a **case to case basis**. ...

Very truly yours, W.P. Senebald

ABS Europe Ltd.  
Hermannstrasse 15  
D-20095 Hamburg

...”

## MetaLine® Series 700 (760, 785, 795)

	MetaLine 760	MetaLine 785	MetaLine 795
<b>Preferred usage</b> (multi-purpose use is possible)	shock absorption rubber repairs noise deadening slip resistance	wear protection erosion protection cavitation protection electrical insulation	anti-fouling performance non-stick character corrosion protection efficiency increase
<b>Processing</b> (spraying / casting / injecting)	APPLICATOR S-700	APPLICATOR S-700	APPLICATOR S-700
<b>Solids content</b> (DIN EN ISO 3251)	100 %	100 %	100 %
<b>Mixing ratio</b> (APPLICATOR S-700)	2 : 1 by volume	2 : 1 by volume	2 : 1 by volume
<b>Consumption</b> (theoretically per mm film thickness)	1.25 kg/m <sup>2</sup>	1.20 kg/m <sup>2</sup>	1.20 kg/m <sup>2</sup>
<b>Processing time</b> (at ambient temperature)	7 min.	1 min.	1 min.
<b>Solidification</b> (at 20 °C – dependent on stress)	> 1.5 days	> 1 day	> 1 day
<b>Hardness sprayed /cast on</b> (A.S.T.M. D2240-68)	60 / 65 Shore A	82 / 85 Shore A	95 / 98 Shore A
<b>Density</b> (DIN 53 479)	1.10 g/cm <sup>3</sup>	1.05 g/cm <sup>3</sup>	1.05 g/cm <sup>3</sup>
<b>Tensile strength</b> (A.S.T.M. D412-68)	20 N/mm <sup>2</sup>	20 N/mm <sup>2</sup>	24 N/mm <sup>2</sup>
<b>Tensile modulus at 100 % elongation</b> (A.S.T.M. D412-68)	6 N/mm <sup>2</sup>	7 N/mm <sup>2</sup>	13 N/mm <sup>2</sup>
<b>Tear resistance</b> (DIN 53 515)	68 N/mm	55 N/mm	68 N/mm
<b>Elongation at break</b> (A.S.T.M. D412-68)	650 %	380 %	275 %
<b>Bashore resilience</b> (DIN 53 512)	63 %	45 %	27 %
<b>Coefficient of thermal conductivity</b> (DIN 52 612)	0.2 W/K·m	0.2 W/K·m	0.2 W/K·m
<b>Dielectric surface resistivity</b> (DIN 53 482)	7 x 10 <sup>10</sup> Ohm	7 x 10 <sup>10</sup> Ohm	7 x 10 <sup>10</sup> Ohm
<b>Dielectric breakdown voltage</b> (DIN 53 841)	> 5 kV/mm	> 5 kV/mm	> 5 kV/mm
<b>High temperature resistance</b> (dry / wet)	+100 °C / +60 °C	+120 °C / +60 °C	+120 °C / +60 °C
<b>Low temperature resistance</b> (dry)	-50 °C	-50 °C	-50 °C
<b>Abrasion according to Taber®</b> (A.S.T.M. D1-044-73 - Rad H-22, dry, 1 kg, 1.000 U)	n.d.	8.2 mg	10.5 mg
<b>Abrasion</b> (DIN 53 516)	85 mm <sup>3</sup>	55 mm <sup>3</sup>	65 mm <sup>3</sup>
<b>Coefficient of static friction</b> (DIN EN ISO 8295)	μ(0) = approx. 0.7	μ(0) = approx. 0.6	μ(0) = approx. 0.15
<b>Approvals</b> (Pharma & Food standards)	FDA 177.1680 (21) EU 1935/2004 EU 10/2011	FDA 177.1680 (21) EU 1935/2004 EU 10/2011	FDA 177.1680 (21) EU 1935/2004 EU 10/2011



### 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 of MetaLine Series 700 covers almost 1 m<sup>2</sup> in a thickness of 1 mm. For an identical coverage of epoxy-ceramic, over 2 kg 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
- 10 kg Series 700 coating product
- mixing tools and brushes
- disposable gloves
- masking tapes
- **detailed Processing Instructions** with video support (pdf-download)



The complete MetaLine Onboard-Kit. Ready to start at any time, any place – by professionals for professionals ...

### We train your crew

We support your crew during technical implementation of your requests on board.

A German MetaLine trainer or an **expert coater trained** at MetaLine Germany will instruct your employees regarding realization of professional repairs locally – in many different languages and almost at any **important port** worldwide! Alternatively, you may also send your employees to our MetaLine training center in Stuttgart (south of Germany) to attend a training session there.

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

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



## ... from the Experts of Coating Technology

You will find MetaLine products used worldwide 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
- Mining Industry and Mining Technology
- 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
- ... and much more