Rubber Lining and Coating Systems

CORROSION PROTECTION

Industrie

REMA TIP TOP

The Corrosion Protection Brand

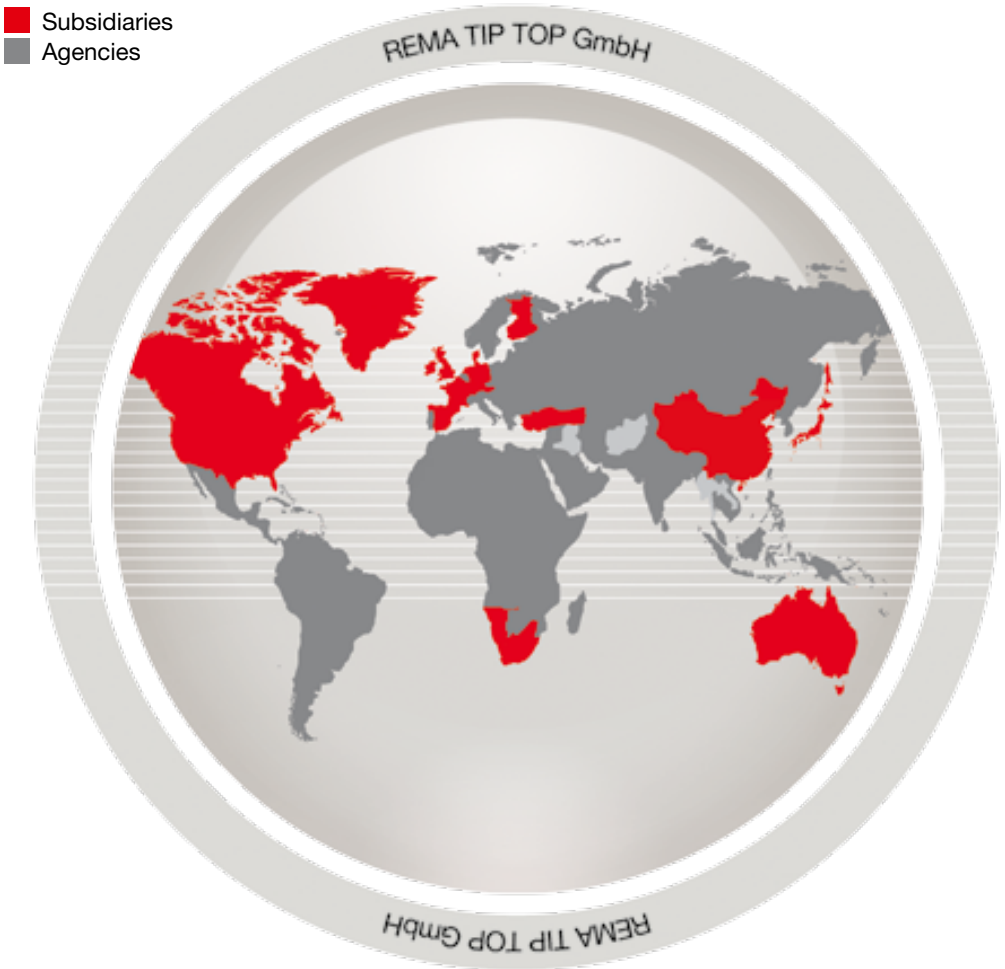
REMA TIP TOP

The excellent quality provided by **REMA TIP TOP Industrie** has been acknowledged for more than 50 years, during which we have repeatedly set new standards with our **REMA TIP TOP** wear-resistant products, together with our repair materials for conveyor belts. This dedication to quality has been equally applied to our Corrosion Protection product range.

The materials used in our **REMA TIP TOP** range of products are highly resistant to chemical, thermal and mechanical wear and tear. Our experienced specialists ascertain which materials and processing techniques are optimal for any given conditions – project related and on-site if appropriate – and so ensure that each protective system can optimally fulfil its task and will successfully contribute to the future economical and effective operation of your installation.

TIP TOP Oberflächenschutz Elbe, a wholly owned subsidiary, supplements our range of products with qualified services. This leading specialist company for all lining and coating work undertakes the complete **REMA TIP TOP** rubber corrosion protection installation, from preparatory works, application of **REMA TIP TOP** rubber lining and coating materials and vulcanisation of workshop rubber lining. In addition, **TIP TOP Oberflächenschutz Elbe** produces all the corrosion protection rubbers for workshop and on-site applications. They are additionally able to provide a comprehensive site installation service.

REMA TIP TOP Industrie and **TIP TOP Oberflächenschutz Elbe** – Your Competent Partner – Anytime, Anywhere.



ONE BRAND – ONE SOURCE – ONE SYSTEM

High-Quality Systems From a Single Source

REMA TIP TOP

The exceptional reliability of **REMA TIP TOP** corrosion protection materials is the result of years of laboratory experiments and the most severe practical tests, carried out under consideration of all types of exposure. The advice provided by our specialists is additionally based on comprehensive individual analysis of the individual conditions of your installation. The surface to be protected is reviewed. Process parameters, the compositions of media, concentrations and temperatures are determined and evaluated. Disruptive factors and risks are considered. This procedure guarantees that the rubber lining/coating recommended will provide your installation with the most efficient and long-lasting corrosion protection.

Five different product lines fulfil a wide range of requirements:

CHEMOLINE Soft rubber lining systems
Excellent chemical and abrasion resistance with aggressive media with a high solids content. For all soft rubber lining systems we offer the appropriate bonding systems that are produced in-house.

CHEMONIT Hard rubber lining systems
Outstanding chemical resistance against mineral acids, bases, organic solvents and aqueous phases. **REMA TIP TOP** offer numerous bonding systems, also from in-house research and production, for application of the particular protective system.

COROFLAKE Polymer coatings
Offer exceptionally good resistance against most solvents, organic and inorganic acids as well as alkaline media, together with extraordinary high resistance to temperature. Particular mention deserves the high diffusion resistance of the COROFLAKE systems.

COROPUR Polyurethane coatings
Guarantee rapid curing and excellent bonding to the substrate even under the most unfavorable conditions (e.g high humidity and low temperatures).

REMACOAT Polyurea coatings
Are particularly distinguished by excellent resistance to abrasion and wear, as well as broad chemical resistance. The extremely short curing times allow dramatic reduction of installation downtimes.

Products and their Properties

OUR PRODUCT RANGE

CHEMOLINE – Soft rubber lining systems

CHEMOLINE 3

Polymer:	Polychloroprene rubber (CR)
Chemically resistant against:	Caustic soda solutions, acids and wastewater.
Continuous use temperature:	80° C
Applications / Miscellaneous:	Oil-resistant and abrasion-resistant against media with a high solids content. DIBt approval: Z-59.22-165

CHEMOLINE 4 A / 4 B / 4 CN

Polymer:	Bromobutyl rubber (BIIR)
Chemically resistant against:	Mineral acids, bases, polar solvents, aqueous phases and also excellent diffusion resistance to gases such as sulphur dioxide, nitrogen oxides and water vapour.
Continuous use temperature:	100° C
Applications / Miscellaneous:	Various uses, e.g. in flue-gas desulphurisation, in brown-coal power stations, mineral processing. Available as pre-vulcanised, self-vulcanising or autoclave version. DIBt approval: Z-59.22-159, Z-59.22-149, Z-59.22-162

CHEMOLINE 8 / 8 CN

Polymer:	Chlorosulphonated polyethylene (CSM)
Chemically resistant against:	Mineral acids, oxidising acids, bases, polar solvents, aqueous phases and hypochlorite solutions.
Continuous use temperature:	80° C
Applications / Miscellaneous:	Particularly suitable for road tankers and tank wagons. DIBt approval: Z-59.22-234

CHEMOLINE 12

Polymer:	Chlorobutyl rubber (CIIR)
Chemically resistant against:	Inorganic acids, bases and aqueous media.
Continuous use temperature:	70° C
Applications / Miscellaneous:	**CHEMOLINE 12** was speacially developed for food and drinking water applications. All required certificates and approvals exist (KTW including warm water test, DVWK W270, KSW, WRAS and FDA).

CHEMOLINE 55 / 55 CN

Polymer:	Natural rubber (NR)
Chemically resistant against:	Mineral acids, bases and aqueous media.
Continuous use temperature:	60° C
Applications / Miscellaneous:	**CHEMOLINE 55** is a soft rubber lining system with high abrasion resistance especially designed for wet environments in containers, drums and pipes.

CHEMOLINE 70 / 70 CN

Polymer:	Chlorobutyl rubber (CIIR) / Polyvinylchloride (PVC)
Chemically resistant against:	Mineral acids, bases, aqueous phases and in particular concentrated hydrochloric acid.
Continuous use temperature:	70° C
Applications / Miscellaneous:	Widely used in electroplating and particularly where hydrochloric acid is contacted (HCl storage tanks).

CHEMOLINE RT / RT CN

Polymer:	Brombutyl rubber (BIIR)
Chemically resistant against:	Mineral acids, bases, polar solutions, aqueous media, and especially oxidising media like nitric acid, chromic acid and sodium hypochlorite.
Continuous use temperature:	120° C
Applications / Miscellaneous:	Electroplating, hydrochloric acid storage tanks, tank wagons as well as reaction vessels with high operating pressure.

CHEMONIT - Hard rubber lining systems

CHEMONIT 18

Polymer:	Natural rubber (NR)
Chemically resistant against:	Mineral acids, bases, organic media and aqueous media.
Continuous use temperature:	100° C
Applications / Miscellaneous:	The electroconductive material is particularly suitable for frequent temperature changes and is used in process vessels, fractionating columns, crystallizers etc.

CHEMONIT 31

Polymer:	Natural rubber (NR)
Chemically resistant against:	Mineral acids, bases, aqueous phases and organic chemicals.
Continuous use temperature:	100° C
Applications / Miscellaneous:	Diverse components in the chemical, chlorine and steel industries, in mineral processing, electroplating and environmental protection. Available as hot water version for construction site application. DIBt approval: Z-59.22-140, Z-59.22-240

CHEMONIT 33

Polymer:	Natural rubber (NR)
Chemically resistant against:	Mineral acids, bases, aqueous phases and organic chemicals, in particular moist chlorine.
Continuous use temperature:	100° C
Applications / Miscellaneous:	Diverse components in the chemical, chlorine and steel industries, in mineral processing, electroplating and environmental protection. DIBt approval: Z-59.22-312

CHEMONIT 35

Polymer:	Isoprene rubber (IR) / Styrene-butadiene rubber (SBR)
Chemically resistant against:	Mineral acids, bases, aqueous phases and in particular excellent resistance against moist chlorine.
Continuous use temperature:	100° C
Applications / Miscellaneous:	Wide application possibilities for components subject to high chemical-thermal loads. The particularly long shelf life and the possibility of autoclave, hot water or steam vulcanisation makes **CHEMONIT 35** particularly suitable for construction site applications. DIBt approval: Z-59.22-322

CHEMONIT 181

Polymer:	Isoprene rubber (IR) / Styrene-butadiene rubber (SBR)
Chemically resistant against:	Mineral acids, bases, aqueous phases and organic aldehydes.
Continuous use temperature:	100° C
Applications / Miscellaneous:	Particularly suitable for drinking water. Available as hot water version for construction site applications. DIBt approval: Z-59.22-142/KTW/KSW DVGW worksheet W 270

Products and their Properties

OUR PRODUCT RANGE

REMA TIP TOP - Flake coatings

COROFLAKE 18

Polymer / Filler	Novolac vinyl ester / C-glass flakes
Chemically resistant against:	Inorganic acids, aliphatic and aromatic solvents.
Max. service temperature:	90° C wet (without insulation), 160° C dry
Applications / Miscellaneous:	Suitable for separators, condensate collectors and FGD absorbers.

COROFLAKE 23

Polymer / Filler	Novolac vinyl ester / Inert flakes
Chemically resistant against:	Organic and inorganic acids, solvents.
Max. service temperature:	70° C wet (with insulation), 180° C dry
Applications / Miscellaneous:	Suitable for stacks, raw gas and bypass ducts as well as heat exchangers. DIBt approval Z-59.13-283

COROFLAKE 24

Polymer / Filler	Bisphenol A vinyl ester / Inert flakes
Chemically resistant against:	Acids, alkalis and hypochlorite.
Max. service temperature:	70° C wet (with insulation), 120° C dry
Applications / Miscellaneous:	Suitable for FGD raw gas and bypass ducts and for concrete protection.

COROFLAKE 27

Polymer / Filler	Novolac vinyl ester / Inert flakes
Chemically resistant against:	Organic and inorganic acids, bases, solvents, aqueous media and flue gas.
Max. service temperature:	70° C wet (with insulation), 170° C dry
Applications / Miscellaneous:	Suitable for flue gas ducts in FGD, also when having frequent temperature changes like in mixing chambers and heat exchangers.

COROFLAKE 28

Polymer / Filler	Novolac vinyl ester / C-glass flakes
Chemically resistant against:	Organic and inorganic acids, aliphatic and aromatic solvents.
Max. service temperature:	70° C wet (with insulation), 180° C dry
Applications / Miscellaneous:	Suitable for FGD raw gas and bypass ducts and wastewater containers.

COROFLAKE 29

Polymer / Filler	Special vinyl ester / C-glass flakes
Chemically resistant against:	High concentrations of sulphuric acid.
Max. service temperature:	70° C wet (with insulation), 230° C dry
Applications / Miscellaneous:	Suitable for FGD raw gas and bypass ducts as well as chimneys.

COROFLAKE 63

Polymer / Filler	Epoxy phenolic / Inert flakes
Chemically resistant against:	Crude oil, Skydrol, petroleum and unleaded petrol.
Max. service temperature:	55° C wet (without insulation), 155° C dry
Applications / Miscellaneous:	Suitable for almost all installations in the petrochemical industry.

COROFLAKE 650 FDA

Polymer / Filler	Epoxy resin / Inert flakes
Chemically resistant against:	Alkalis and dilute organic acids.
Max. service temperature:	50° C wet (without insulation), 110° C dry
Applications / Miscellaneous:	Suitable for drinking water and for use in the food industry. KTW / DVWG W 270 approved.

COROFLAKE 200

Polymer / Filler	Novolac epoxy resin / C-Glass flakes
Chemically resistant against:	Alkalis and acids particularly high concentrations of sulphuric acid.
Max. service temperature:	60° C wet (without insulation), 95° C dry
Applications / Miscellaneous:	Suitable for pump bases, channels and collection basins exposed to 98 % H_2SO_4.

REMA TIP TOP - Laminate coatings

TIP TOP LINING 65

Polymer / Filler / Reinforcing:	Bisphenol-A vinyl ester / 2 glass mats / 1 surface tissue / Silica
Chemically resistant against:	Organic acids, alkalis and hypochlorite.
Max. service temperature:	80° C wet (without insulation), 120° C dry
Applications / Miscellaneous:	Suitable for components in chemical and pulp industry installations.

TIP TOP LINING 74

Polymer / Filler / Reinforcing	Novolac vinyl ester / 2 glass mats / 1 surface tissue / Silica
Chemically resistant against:	Organic and inorganic acids, aliphatic and aromatic solvents.
Max. service temperature:	80° C wet (without insulation), 160° C dry
Applications / Miscellaneous:	Crack-bridging laminate coating. DIBt approval Z-59.12-298

TOPLINE W

Polymer / Filler / Reinforcing	Bisphenol-A vinyl ester / 1 glass mat / silica and aluminium oxide
Chemically resistant against:	Acids, alkalis and suspensions.
Max. service temperature:	75° C wet (without insulation)
Applications / Miscellaneous:	For installations subject to a high level of abrasion.

Products and their Properties

OUR PRODUCT RANGE

REMA TIP TOP – Polyurethane coatings

COROPUR Ferro / Ferro LS (LS = good light and UV resistance))
Polymer / Filler: Moisture-hardening aromatic polyisocyanate (type Ferro), moisture-hardening aliphatic polyisocyanate (type Ferro LS)
Chemical resistance: Excellent corrosion protection in industrial and marine atmospheres.
Max. service temperature: 120° C dry
Applications / Miscellaneous: Civil engineering: bridges, masts, steel constructions / Plant construction: containers, cranes, tanks, sewage treatment works, waste disposal plants.

COROPUR Cover RAL
Polymer / Filler: Aliphatic, moisture-hardening polyisocyanate / organic and inorganic pigments
Chemical resistance: Atmospheric corrosion protection with very good light and weather resistance various Colour (RAL) and gloss levels are available.
Max. service temperature: 140° C dry
Applications / Miscellaneous: Particularly suitable for harbour facilities and crane installations, constructional steelwork, piping and off-shore installations. Plant construction: containers, cranes, tanks, sewage treatment works, waste disposal plants.

COROPUR Tar / Tar 21
Polymer / Filler: Moisture-hardening polyisocyanates and tar, together with fillers and micaceous iron oxide.
Chemical resistance: Good chemical resistance and low water vapour diffusion.
Max. service temperature: 80° C dry, short-term 100° C
Applications / Miscellaneous: Particularly suitable for use in steel water construction acc. to DIN EN ISO 12944-5 corrosivity categories Im1, Im2 and Im3.

COROPUR Non Abrasiv / Non Abrasiv LS (LS = good light and UV resistance)
Polymer / Filler: Moisture-hardening polyisocyanates / inorganic and organic pigments.
Chemical resistance: High abrasion resistance, good chemical resistance and low water and water vapour diffusion.
Max. service temperature: 140° C dry
Applications / Miscellaneous: Steel water construction acc. to DIN EN ISO 12944-5 corrosivity categories Im1, Im2 and Im3, e.g. for pressure pipelines, sewage treatment plants, locks.

REMA TIP TOP – Polyurea coatings

REMACOAT A-60
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Max. service temperature: 40° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: Excellent resistance to weather under high ozone concentrations and under dynamic burdening.

REMACOAT A-70 S
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Max. service temperature: 40° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: Comparable to **REMACOAT A-80** but with natural flowing properties, smooth surface, higher impact resistance.

REMACOAT A-80
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Max. service temperature: 40° C wet / -40° C...+130° C (short-term150° C) dry
Applications / Miscellaneous: High mechanical strength and optimal sliding and wet abrasion resistance.

REMACOAT D-40
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Chemically resistant against: Dilute acids (inorganic and organic) and alkalis, diverse types of oil and aqueous phases at 50° C (wet).
Max. service temperature: 50° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: DIBt approved (Z-59.12-305) as organic surface protection for concrete acc. to 19 L of the German water ecology act. Particularly suitable for wastewater systems and LAU (storing, filling, handling) installations.

REMACOAT D-40 S
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Chemically resistant against: Dilute acids (inorganic and organic) and alkalis, diverse types of oil and aqueous phases at 50° C (wet).
Max. service temperature: 50° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: Natural flowing properties, optimal large-area layer thickness levelling, smooth surface.

REMACOAT C
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Chemically resistant against: Numerous chemicals, in particular petrol, aviation fuel, light fuel oil and internal combustion engine oils.
Max. service temperature: 45° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: DIBt approved (Z-59.12-304) as an electrically dischargeable, organic surface protection for concrete acc. to 19 l of the German water ecology act, for coating LAU (storing, filling, handling) installations for combustible liquids (AI, AII and B) to avoid ignition following electrostatic charging.

REMACOAT FDA
Polymer / Filler: HDI-Isocyanate / Mixture of polyoxyalkylamines
Chemically resistant against: Salt solutions and dilute, non-oxidising acids and alkalis at temperatures of +45-50° C (wet).
Max. service temperature: 45-50° C wet / -40° C...+100° C (short-term 130° C) dry
Applications / Miscellaneous: Light-fast, colour-fast cover coating, also suitable for contact with dry foods.

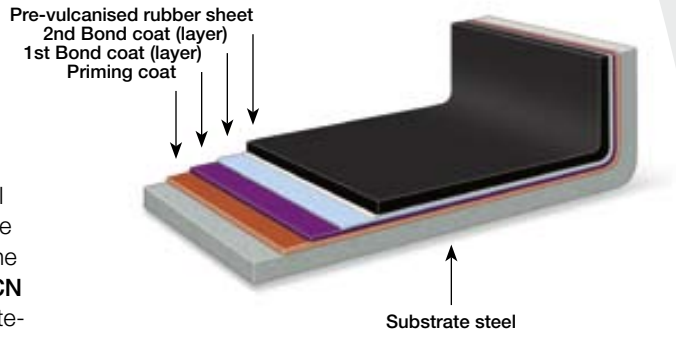
REMACOAT FR
Polymer / Filler: Diphenylmethane-diisocyanate (isomers and homologues) / Mixture of polyoxyalkylamines
Chemically resistant against: Dilute acids (inorganic and organic) and alkalis, various types of oil, as well as aqueous phases at 50° C (wet).
Max. service temperature: 50° C wet / -40° C...+130° C (short-term 150° C) dry
Applications / Miscellaneous: The special formulation of **REMACOAT FR** enables it to fulfil the requirements of ÖNORM B 3800 Parts 1 and 2 for flame retardant B1, drop formation Tr1 and smoke intensity Q1. The classification B1 makes **REMACOAT FR** especially suitable as flame retardant surface protection in the construction industry.

Our Product Range

RUBBER LINING SYSTEMS

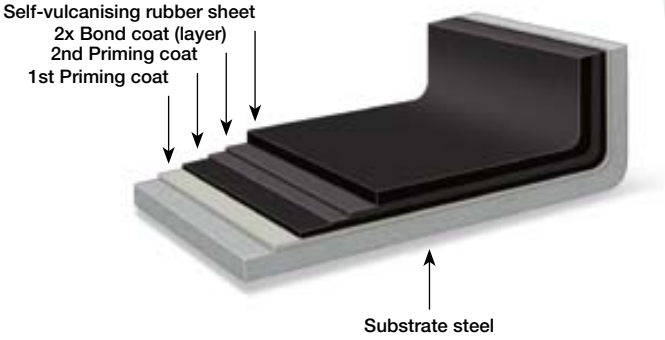
CHEMOLINE Soft rubber lining (pre-vulcanised)

The **CHEMOLINE CN** product line is based on high-quality rubber types and mixtures that cover a great diversity of applications in environmental protection and in the process industries. **REMA TIP TOP** supplies these pre-vulcanised rubber lining systems complete with a bonding-friendly CN-base layer, which enables them to be used on all steel or concrete substrates. German DIBt approval for use in the storage of water-hazardous substances acc. to §19 of the German Water Ecology Act is in place for many **CHEMOLINE CN** systems. An outstanding feature of the **CHEMOLINE CN** materials is their extremely high chemical, mechanical and thermal resistance. They are applied with the proven two-component BC 3000 or BC 3004 **REMA TIP TOP** bonding systems in a cold-curing process. The non-porous rubber sheets are produced by vacuum extrusion in layer thicknesses of 2 to 6 mm.



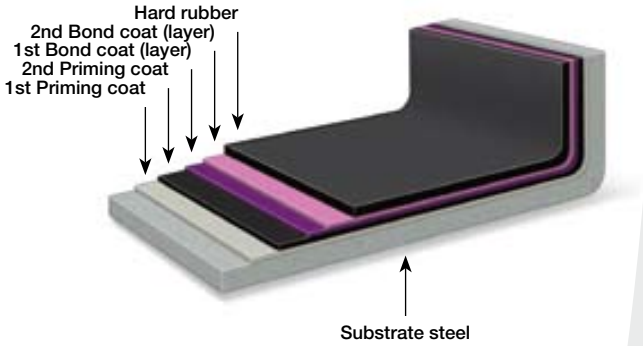
CHEMOLINE Soft rubber lining (unvulcanised)

Non-vulcanised **CHEMOLINE** soft rubber lining systems are suitable for use in environmental protection and in process industries where the greatest chemical, thermal and mechanical resistance is demanded. TC 5000 Series vulcanising bonding systems enable their use at operating temperatures of up to 120° C. These bonding systems are distinguished by their great bond strength. According to their formulation, non-vulcanised **CHEMOLINE** soft rubber systems are vulcanised in autoclaves, or they vulcanise at ambient temperature after being applied at the construction site. German DIBt Approval for use in the storage of water-hazardous substances acc. to §19 of the WHG (German Water Ecology Act) is in place for many non-vulcanised **CHEMOLINE** systems. The non-porous rubber sheets are produced by vacuum extrusion in layer thicknesses of 2 to 6 mm.



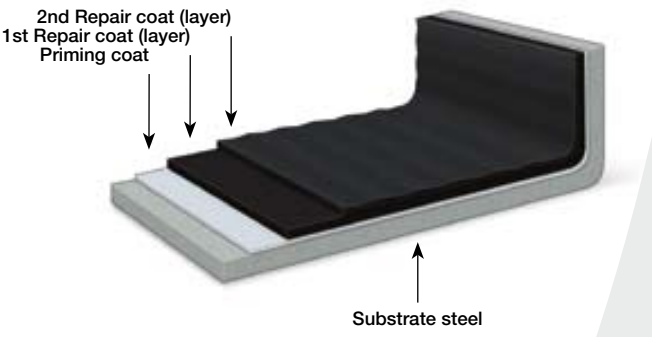
CHEMONIT Hard rubber lining

Non-vulcanised **CHEMONIT** hard rubber lining systems are based on high-quality synthetic and natural rubbers of the most advanced kind. They are suitable for applications in the process industry at temperatures of up to 100° C. After application, **CHEMONIT** hard rubber lining systems are vulcanised in the autoclave, although special formulations of some materials allow on-site vulcanisation with hot water or steam. German DIBt approval for use in the storage of water-hazardous substances acc. to §19 of the German Water Ecology Act is in place for many **CHEMONIT** systems. The non-porous rubber sheets are produced by vacuum extrusion in layer thicknesses of 2 to 6 mm.



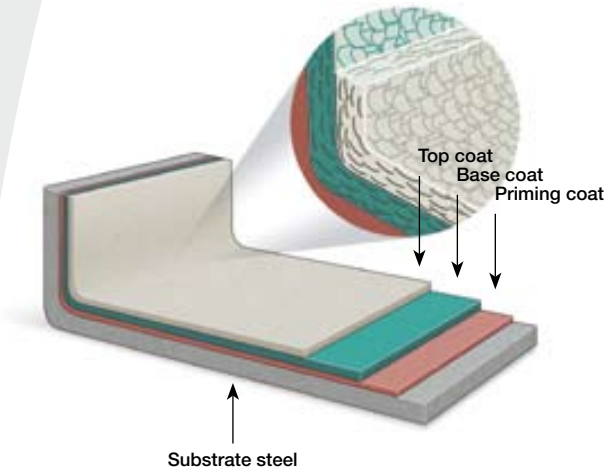
REMA TIP TOP Repair systems

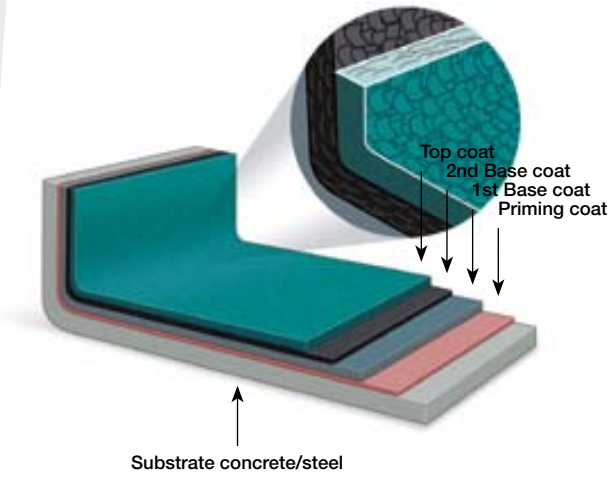
REMA TIP TOP repair systems are based on high-quality epoxy or vinyl ester resins, as well as on synthetic rubbers. According to the type of rubber lining, damage to the lining is quickly and permanently repaired by use of either our **REMA TIP TOP soft-rubber** repair kit or our **CHEMONIT hard-rubber repair paste**. Further systems have been specially formulated for steel restoration and for the pre-treatment of concrete surfaces. A simple process enables small repairs to be professionally carried out by maintenance personal. **REMA TIP TOP** supplies the repair systems in appropriately paired two-component containers.

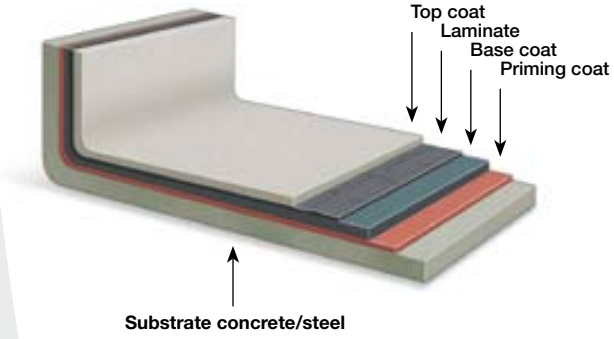


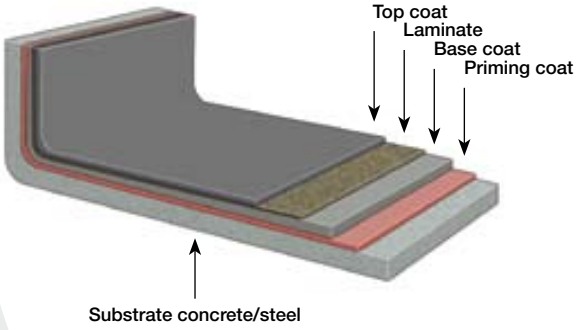
Our Product Range

COROFLAKE- / LINING-SYSTEMS









COROFLAKE Trowelled lining

COROFLAKE lining systems are applied with a trowel and protect metallic components against aggressive media under immersion conditions. They are based on polyester and vinyl ester resins and reinforced with micro-thin C-glass flakes. Whereas the chosen resin ensures excellent chemical resistance, the parallel alignment of the glass flakes to the underlying surface provides outstanding permeation resistance. A nominal thickness of 2.0 mm is achieved with just two layers. These **COROFLAKE** trowel lining systems can be used for almost all media at temperatures up to 90° C under immersion conditions.

COROFLAKE Spray coatings

Sprayed-on or rolled-on **COROFLAKE** systems combine the chemical resistance of trowel lining with the simplicity of the spray application technique. They are based on vinyl ester, epoxy and epoxy Novolac resins and reinforced with either C-glass flakes, mica or graphite. More than 100 flakes are applied on top of each other in a layer of 1 mm thickness. According to the environment, the lining will be subjected to, two or more layers at 1.0 to 2.5 mm thickness are applied. **COROFLAKE** spray coatings offer economical long-term protection of installations and a long service life. They can be used at temperatures of up to 230° C under dry service conditions.

TOPLINE Lining system

Polyester, vinyl ester, epoxy and epoxy-Novolac resins are also used for glass fabric reinforced lining systems with a layer thickness of approx. 3 mm. These are distinguished not only by their resistance to corrosion but also by their outstanding impact strength and abrasion resistance. If necessary, they can be formulated to be electrically dischargeable. The innovative **REMA TIP TOP** polymer technology also enables such coatings to be used in the food and pharmaceutical industries. Their non-slip texture and dense surface require no additional sealing. The coatings are suitable for use up to temperatures of 75° C under immersion conditions.

TIP TOP LINING

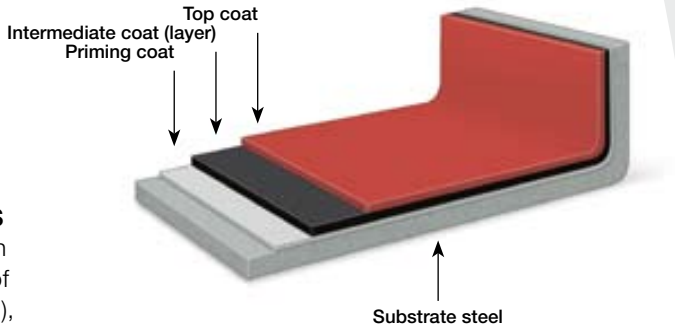
These are comprised of the same resins as the **TOPLINE** series but with a larger portion of resin to provide the best possible chemical resistance. The lining begins with the priming coat, followed by a filler layer, two glass mats and a surface tissue. A sealing layer, rich in resin, completes the 3.0 to 4.0 mm thick lining. The glass mats and the flexible resin allow this lining to be used at operating temperatures of 80° C and to be cleaned with steam-jet equipment. In addition, this lining can bridge cracks in concrete of up to 0.2 mm width.

Our Product Range

COROPUR- / REMACOAT-SYSTEMS

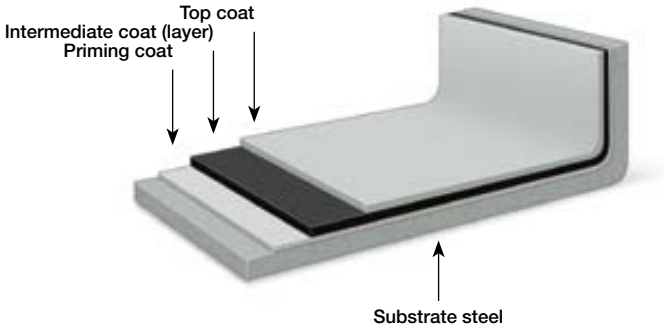
COROPUR polyurethane coatings for atmospheric corrosion protection

COROPUR stands for moisture-hardening, single component coating systems that can be applied by brushing, rolling or spraying procedures. Alongside the simplicity of application and their high tolerance to moisture, **COROPUR** coatings feature a combination of great surface strength with high elasticity, and so ensure long-term corrosion protection of steel component parts. **COROPUR** is normally applied at least as a two-layer coating (DFT 60-80 µm per layer). **COROPUR Ferro**, **COROPUR Ferro LS** and **COROPUR Cover RAL** are mainly used for th corrosion protection of steel parts according to the requirements of DIN EN ISO 129-44-5 (corrosivity category C1 - C5-I and C5-M), in combination with the appropriate primers.



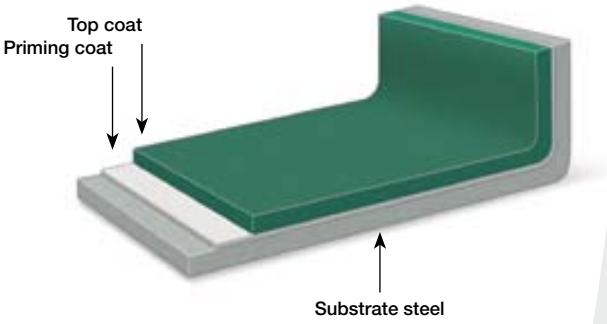
COROPUR polyurethane coatings for steel water constructions

COROPUR stands for moisture-hardening, single component coating systems that can be applied by brushing, rolling or spraying procedures. Alongside the simplicity of application and their high tolerance to moisture, **COROPUR** coatings feature a combination of great surface strength with high elasticity, and so ensure long-term corrosion protection of steel component parts. **COROPUR** is normally applied at least as a three-layer coating (DFT 150-250 µm per layer). **COROPUR Tar**, **COROPUR Tar 21**, **COROPUR TF 21** and **COROPUR Non Abrasiv** are mainly used for the corrosion protection of steel water engineering constructions according to the requirements of DIN EN ISO 129-44-5 (corrosivity category Im1, Im2 and Im3 for direct contact with freshwater, seawater and soil) in combination with the appropriate primers.



REMACOAT Polyurea coatings

REMACOAT stands for highly-reactive 2-component spray coatings based on polyurea. Application is undertaken with 2K-high pressure airless injection machines. In combination with appropriate primers, **REMACOAT** is suitable for the coating of steel, concrete, light metal, plastics and many other materials. **REMACOAT** is insensitive to moisture, cures even at very low temperatures and is relatively insensitive to ambient conditions. **REMACOAT** material is available in hardnesses of from 60 shore A to 50 shore D, and can be used as a multifunctional surface protection, e.g. for component sealing, corrosion protective coatings, protection against sticking and wear. The layer thickness can be varied and is applied as a single layer of 1.5 mm to 25 mm thickness and more, according to the application.



APPLICATION AREAS

Chemical industry

Hydrochloric acid, sulphuric acid, caustic soda solutions, methanol, methylene chloride, glycerol, acetates, dyes and urea are only some of the corrosive media that are met daily in chemical plants. Such plants can be successfully protected against corrosion with **REMA TIP TOP** lining systems. Our chemists select the optimal lining system for each case according to the particular prevailing operating conditions. The success of **REMA TIP TOP** lining systems is based on the many years of their usage in the chemical industry and our correspondingly highly experienced chemists. Should a case occur that has not been previously experienced, then it is simulated in our laboratories so that the suitable lining material can be determined.

Industrial water treatment works

The activity of **REMA TIP TOP** in this environmental protection area is basically the supply of lining systems for the protection of aeration tanks, sludge thickeners, scrapers, waste-water piping and sedimentation baths. The economical benefit associated with the use of **REMA TIP TOP** lining systems is due to the technology that allows them to be also applied to wet concrete, together with their simple working and rapid hardening. These factors are not only beneficial in the case of new plants, but also reduce maintenance costs. The combination of the high chemical resistance of **REMA TIP TOP** lining systems and their good mechanical properties with low abrasion values result in very long service lives in industrial effluent treatment works.

Paper and pulp industry

Alkaline and oxidising chemicals, as well as concentrated acids, are used in the production of paper and pulp. As most processes run at raised temperatures, there is also increased corrosive action on steel and concrete. **REMA TIP TOP** lining systems are resistant to changing temperatures with simultaneous corrosive attack. Their application in couch pits, Hollanders, tubs, nutsch filters and bleaching towers can provide long-term protection of these plant components. **REMA TIP TOP** lining systems replace expensive alloys and contribute to cost-savings in the paper and pulp industries.

Food industry

The composition of jointless **REMA TIP TOP** lining systems comply with most food laws so that they are highly appropriate for use in the food industry. Their smooth and impenetrable surface is dirt-repellent, hygienic and particularly easy to clean. **REMA TIP TOP** lining systems replace expensive lining materials such as enamel or brickwork. Typical applications in the food industry include the lining of process and storage tanks for starch production, storage tanks and secondary containment for chemicals, water treatment systems and fermenters for the brewing industry.

BRANCHES OF INDUSTRY

Power Stations

REMA TIP TOP supplies coating and rubber lining materials for various areas in modern power stations that operate with fossil fuels, such as semi-anthracite coal and brown coal. The centrepiece of the environmental protection facility, the flue-gas desulphurisation plant with the slurry tanks together, is protected against corrosion with lining systems designed for the special conditions of the various components. **REMA TIP TOP** corrosion protection systems are distinguished not only by their excellent chemical resistance at high temperatures but also by their high resistance both to the permeation of water-vapour saturated clean gas and against abrasion by the particles in the slurry. For the corrosion protection of the plant according to the requirements of the customer, **REMA TIP TOP** can use pre-vulcanised or self-vulcanising rubber lining systems (**CHEMOLINE**) or trowed, spray or laminate lining systems (**COROFLAKE, TIP TOP LINING**). The materials are mostly applied on-site, but are however supplemented by components lined in the workshop, such as suspension piping, filter holders and agitators.

Mineral Processing

The winning of metals such as nickel and copper is achieved by leaching them out of mineral ores by means of a multi-stage chemical process in liquid media containing sulphuric acid and with a high solids content. The medias are heated up to 100° C to increase solubility. The lining system must fulfil very high demands with respect to chemical resistance and have a good anti-abrasion behaviour. **REMA TIP TOP** offers vulcanised or self-vulcanising rubber lining systems (**CHEMOLINE**) for process tanks and fittings. They have proven themselves in practice for this purpose for more than two decades. **REMA TIP TOP** lining systems are predominately used to protect concrete areas in collecting basins.

Fertilisers

The winning of phosphates for the fertiliser industry is achieved in processes where rocks containing phosphates are decomposed at high temperatures and under vacuum. The phosphates that are thereby produced as intermediate products are subjected to in-process storage prior to refinement to fertilisers. The high acidity and solid content of the sulphuric acids used in this process place the highest demands on the bonding of the lining systems, especially at high temperatures. **REMA TIP TOP** has supplied the proven rubber lining systems required for many years and all over the world. They are supplemented by types based on bromobutyl or butyl compounds (**CHEMOLINE**) and hard rubber lining (**CHEMONIT**) that can be applied on-site. Furthermore, the product range is rounded off by **TIP TOP LINING** systems for concrete protection in collecting basins, channels and pits, as well as coatings for protection against atmospheric pollution (**COROPUR**).

Petrochemicals

The petrochemical industry is occupied with the preparation of hydrocarbons from the raw materials crude oil and natural gas, whereby intermediate products are used for the production of plastics and fuels. Because of the corrosiveness of petrochemical products, selected **REMA TIP TOP** lining systems based on vinyl ester, epoxy phenolic (**COROFLAKE**) or polyurea (**REMACOAT**) are applied to protest numerous refinery installations, such as storage tanks, separators, filter systems and pipelines. Appropriately approved polyurea systems (**REMACOAT**) are applied for secondary corrosion protection (catch basins, secondary containment, discharge and transfer installations). For the outer coating of storage tanks, pipelines and steel components, **REMA TIP TOP** offers coating materials based on moisture-hardening, single component polyurethanes (**COROPUR**).

REFERENCES

Olympic DAM Australia

Complete lining of a mineral processing plant for uranium ore. The tanks were lined completely in segments using approx. 45,000 m² of **CHEMOLINE 4 CN**. The pipework was lined with approx. 25,000 m² of **CHEMOLINE 4 CN** and **REMALINE 40 CN**. Since various tank bottoms had not been built using conventional stainless steel, **REMA TIP TOP** utilized an innovative system, which involved the application of approx. 13,000 m² of a specially developed 3 mm thick geomembrane.
Medium: inorganic salts and sulphuric acid

Wacker Burghausen

REMA TIP TOP hard and soft rubber lining materials were used to protect 11 tanks within this brine processing plant, which had a total surface area to be lined that exceeded 2,000 m². The lining work for all tanks having a diameter up to 3,200 mm was undertaken at our workshop in Wittenberg, where they were provided with a **CHEMONIT 31** hard rubber lining to protect against corrosion and, in some cases also fitted with **CHEMOLINE 3** and **CHEMOLINE 4 A** soft rubber lining systems as an additional protection against abrasion. Larger tanks were lined in a nearby shipyard on the construction site with the **CHEMOLINE 4 CN** rubber lining system.
Medium: sodium chloride, brine, hydrochloric acid and caustic soda solution

Iskenderun Power Plant

The German company STEAG constructed 2 power plant units with respectively 605 MW in Iskenderun / Turkey. **TIP TOP Oberflächenschutz Elbe** executed the complete rubber lining and coating works for the flue-gas desulphurization units installed downstream. Approx. 4,800 m² of **CHEMOLINE 4 B** was applied to the absorbers on site, along with 4,000 m² of **CHEMOLINE 4 CN** to the tanks. A total of 10,000 m² steel surface areas in the stack flues and the connecting ducts were protected with **COROFLAKE 23**. The spray zones and circulation pipes were rubber-lined with 900 m² of **CHEMOLINE 4 A** and **CHEMOLINE 4 B** at our workshop in Wittenberg.
Medium: flue-gas, scrubbing suspension

Bewag Power Plant Reuter Berlin

Extensive refurbishing works were carried out in the 'C' scrubber of the Reuter Power Plant using **REMA TIP TOP** rubber lining and coating materials. Approx. 2,150 m² steel surfaces in the scrubber were protected with **CHEMOLINE 4 B**. In the crude gas inlet, a steel surface measuring 300 m² was coated with **COROFLAKE 23**. In addition, **TIP TOP Oberflächenschutz Elbe** was also responsible for the execution of various auxiliary works, such as the preparation of surfaces and treatment of steel, as well as all dismantling and re-assembly works, in conjunction with several different subcontractors.
Medium: flue gas, scrubber suspension

Statoil Norway

In the early 1980s, Statoil had two gas pipelines, each 8 km long and in a ventilated concrete tunnel about 300 m under sea level, lined with **COROPUR Tar.** Despite the permanent influence of salt water, almost 100 % humidity and constant ventilation, the polyurethane lining is still in very good condition. A good 20 years after the original lining, in 2003, the customer decided not to renew it, but to simply have repaired the little mechanical damage that had occurred. This result exceeds by far the experience customary to the market.

Shell AG, Hamburg

The surface of four loading bridges on the river Elbe was coated with a polyurea system developed specifically for this application (**REMACOAT C**). This surface coating had to fulfil many demands. In order to avoid a complete repair, the surface area was to be sealed with a permanently elastic, crack-bridging coating that provided temporary chemical resistance against diverse petrochemical products and was also classified as electrically dischargeable, to prevent ignition of highly flammable substances by electrostatic charges. A building supervision approval from the DIBt confirmed the suitability of **REMACOAT C** for the permanent sealing of catch basins, receiving rooms and concrete surfaces in installations for storing, filling and handling water-hazardous substances.

Mitsubishi Chemicals, Indonesia

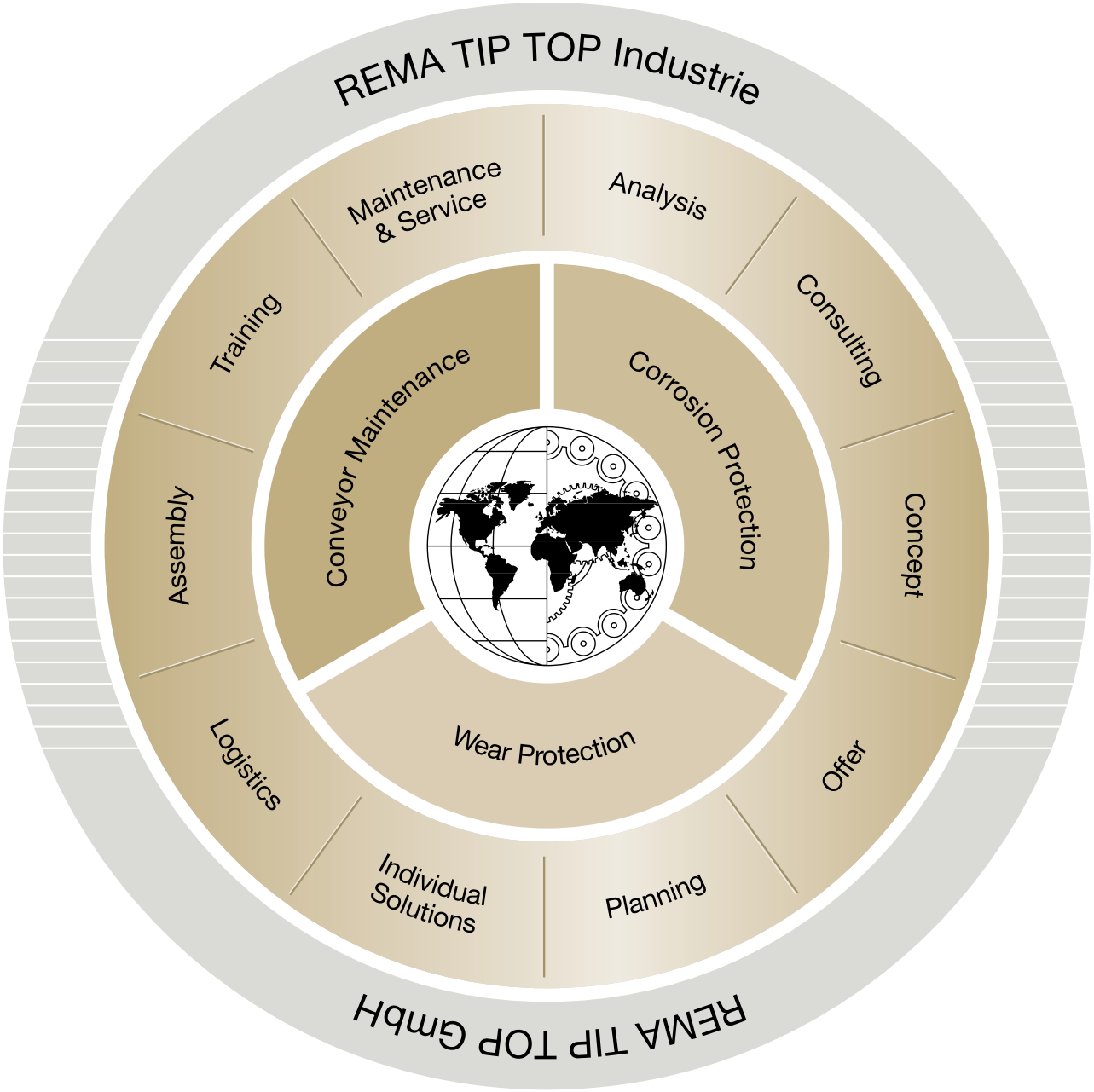
The bottom of a storage tank for industrial diesel oil (IDO) was coated with **REMACOAT D-40**. The flexible steel bottom, consisting of steel plates lap welded, showed relatively high pit corrosion. Because of the great time pressure, a chemically resistant coating system was required that could be applied within four days, a period that also included the surface pre-treatment, under tropical climatic conditions (35° C, 90 % humidity). The use of the highly reactive **REMACOAT D-40** and the moisture-hardening primer **REMACOAT PR 100** allowed the application time to be so drastically reduced, that the narrow time window was met without any problems.

Vattenfall, Germany

In the Lausitzer brown coal industry, overburden excavators remove the sand, gravel and clay that are on top of the coal. As a result of the high clay content, the overburden material tends to cake in the excavator bucket and so considerably reduces the conveying performance of the excavator. Coating of the bucket with **REMACOAT A-80** not only minimised the caking, but also reduced the wear on the bucket. With the seamless **REMACOAT A-80** spray coating, the layer thickness (8 to 10 mm) could be steplessly suited to the extent of wear.

Our service is your succsess

OUR SERVICE CYCLE



Our product range

REMA TIP TOP INDUSTRIE – THE COMPLETE PORTFOLIO

REMA TIP TOP – Certified Top Quality

The corrosion resistant materials offered by **REMA TIP TOP** are manufactured in our own production facilities utilising state-of-the-art processing technologies. Our stringent quality assurance measures (DIN EN ISO 9001 Certification) guarantee that all products and techniques will comply with the respective country-specific regulations and standards, and in some cases, will even greatly exceed these. The implementation of these measures is assured by our trained technical staff throughout the entire production process, from the time of order through delivery and after-sales service.

TÜV CERT DIN EN ISO 9001:2000

Our specialists are also available for consultation in the following areas:

Conveyor maintenance:

- Rubber and ceramic lagging for pulleys
- Rubber lagging for rollers (return idlers, etc.)
- Impact damping equipment
- Lateral guiding systems
- Belt cleaning systems
- Splicing and repair systems
- Cleats and corrugated edges
- Dust sealing systems

Wear Protection:

- Rubber liners
- Polyurethane liners
- Non-stick liners
- Ceramic liners
- Tube liners
- Components made of special rubber
- Mill lining
- Rubber and polyurethane screen lining

Bonding systems and solutions

Specialist tools and accessories

Your local contact:

582 1261 - II.08 Printed in Germany

REMA TIP TOP GmbH
Business Unit Industrie

Gruber Strasse 63
85586 Poing/Germany
Phone:
+49 8121 707-245
Fax:
+49 8121 707-222
www.rema-tiptop.com
info@tiptop.de