Coil Industry:

Advanced technologies for coil applied surface treatment and coating processes.

Chemetall

expect more

Expect more from a leading global supplier of applied surface treatment technologies

As one of the leading global players, Chemetall is familiar with surface treatment in all its facets. Quality products and services are the prerequisite of our business success. However, at Chemetall, we know that it takes more than that to be a preferred global supplier.

The chemical treatment of metal surfaces is Chemetall's core competence. Like no other company, we base the focus of our worldwide actvities on the development and implementation of customized technology and system solutions for surface treatment. The portfolio comprises technologies for cleaning, giving corrosion protection, sealing, improving paint adhesion, and facilitating the forming and treatment of metals. Globally established technologies, for example Oxsilan®, Gardobond® and Ardrox®, are used in the most diverse market sectors from automotive to aerospace, from the appliance to architectural and construction industries. Over the past decades, Chemetall has been playing a leading role in shaping metal treatment.

In focus: value added for customers

Good products and quality services are the prerequisites for a successful business. However, at Chemetall we believe that true success lies in a close and partnership-based cooperation with customers. It is therefore our aim to offer a value added product with top quality processes, on-time deliveries and excellent technical service.

Chemetall company headquarters: Frankfurt am Main, Germany

Globally active, locally based

The global business activities of Chemetall are based on tradition and experience dating back all the way to the 19th century. Nowadays, Chemetall is one of the leading global players in surface treatment with headquarters in Frankfurt am Main, Germany. With 2,100 employees, 40 subsidiaries and 22 production sites, Chemetall is a financially strong and fast growing company with a long-term orientation, and we continue to aim high: we intend to strengthen our quality and innovation leadership even further. With sales and service teams, laboratories and warehouses at locations all around the world, we are operating in close proximity to our customers.

Sustainably successful

Responsible practices and sustainable development are key principles of Chemetall. Our first priority is to consistently implement environmental protection and work safety guidelines and to continuously improve the safety of our worldwide production sites. Chemetall acts responsibly with a view to society and the environment and puts them on an equal footing with its financial targets.

Reliable supplier to the coil industry

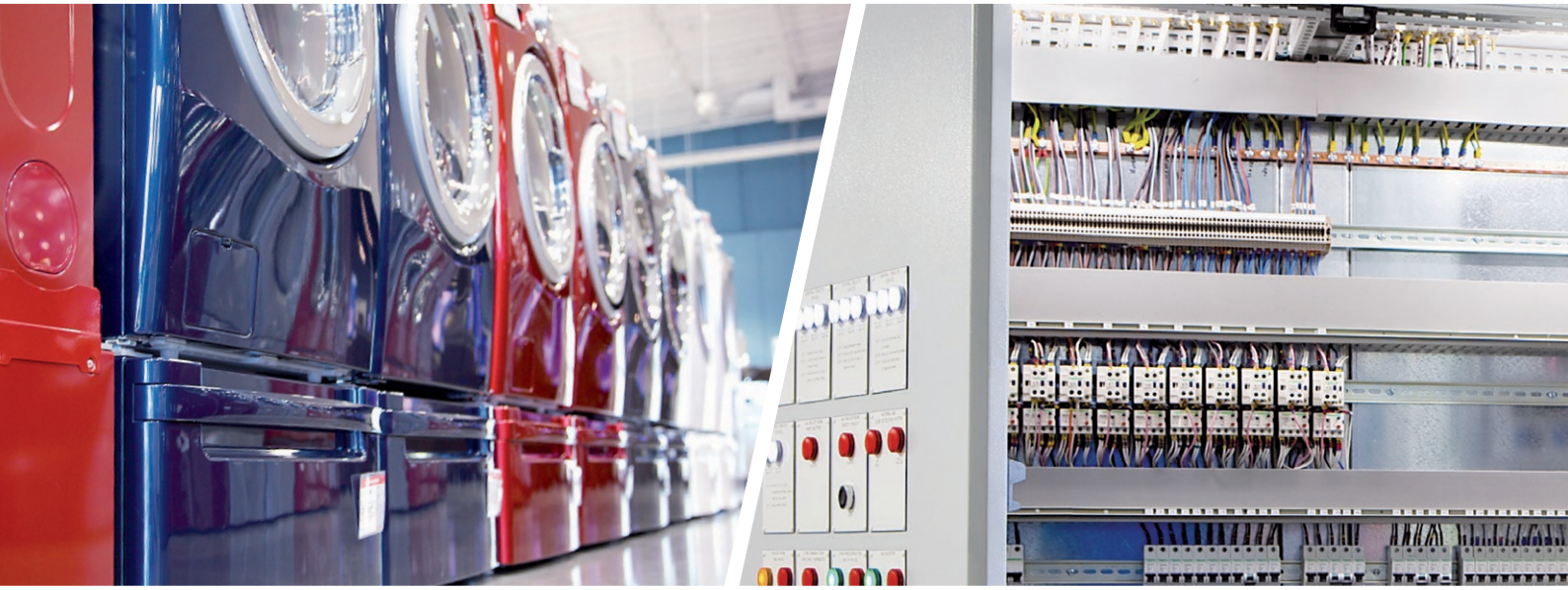
Metal pretreatment, thin organic coatings and coil coatings play a vital role in the manufacturing of high-performance coils. As a major supplier to the coil industry, Chemetall is working with all leading steel and aluminium mills and job-coaters worldwide on the development of advanced solutions for coil applications.

With our highly effective and broad range of products, we can support our customers throughout the entire process – from cleaning, skin pass and post-treatment by phosphating or passivation in galvanizing processes through to pretreatment, primer and topcoat application during the coil coating process.

Benefit from our long-standing global experience in the coil business and our comprehensive technical services.

More to read on www.chemetall.com

Advanced chrome-free technologies for coil applications

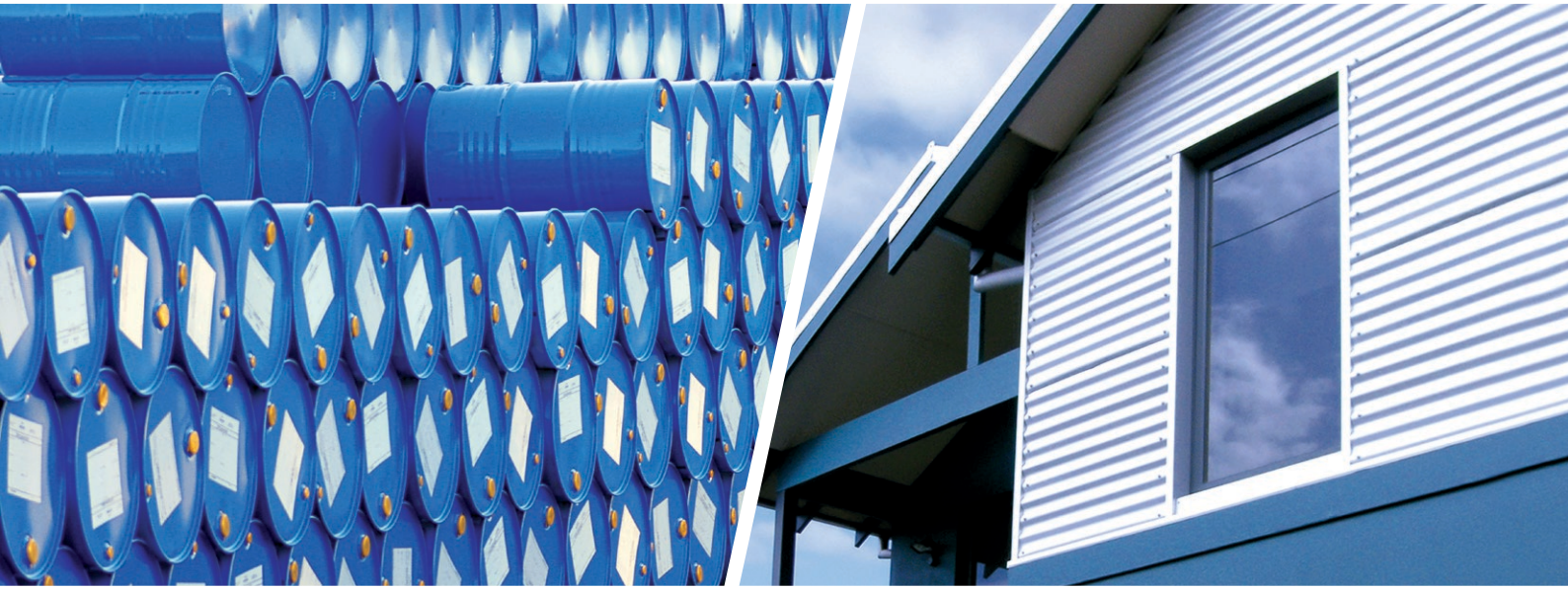


Aluminium and steel coil finishing is Chemetall's focus. For both materials, we offer a strong portfolio of pretreatment processes, thin organic coatings and coil coating technologies, which meet today's and tomorrow's market needs. An additional plus for our customers: our well-equipped laboratories, a wide range of services, and extensive expertise.

Recent decades have seen remarkable advances in the pretreatment, coating and painting technologies, all aimed at enhancing performance, simplifying process flows and achieving greater process cost savings. Major efforts have also been made to meet increasingly stringent health, safety and environmental standards. The wide use of chrome-free technologies clearly demonstrates that high quality and environmental properties can go hand in hand.

Long-term protection and aesthetics

Our main activities in the coil industry focus on an effective pretreatment and the enhancement of thin organic coatings and coil coating technologies. Whether it is for appliances, building products, garage doors, car bodies or can-end stock – our efficient technologies are used to provide a high-quality, durable and long lasting protective coating. Our specialty technologies allow for excellent corrosion protection, very good metal forming and outstanding paint adhesion. Whether it is aluminium, cold-rolled steel, galvanized steel or stainless steel – metals pretreated with our technologies are used in the automotive, appliances, building, electrical and packaging industries.



Comprehensive technical services

With up-to-date application processes, drying technologies and analytical facilities, Chemetall provides a comprehensive range of technical support services for customers' processes. In our coil coating laboratory, we offer high-tech equipment for near infrared (NIR) or UV curing. Highly qualified laboratory technicians are available to help our customers optimize their processes.

Cooperate to innovate

As a leading coil coating supplier, Chemetall focuses on the development of sustainable solutions – with regard to ecologically sound processes as well as enhanced technologies that are viable for the future. Close cooperation with customers, universities, external research institutes, and plant engineering companies forms an integral part of our research and development work for coil coating applications. This enables us to work on tomorrow's challenges today, such as a completely metal-free process.

Broad portfolio

Many leading companies have been relying on Chemetall's broad range of high-performance technologies and technical services for many years – and this is for a good reason: our premium surface treatment technologies allow quality standards to be raised while meeting customers' manufacturing objectives, legal requirements and environmental targets.

Technologies at a glance	
Gardobond®	Pretreatment and Phosphating Processes
Gardobond® PC	Permanent Coatings, Pretreatment Primers
Gardoclean®	Cleaners
Gardolene®	Activating and Passivating Agents
Gardolube®	Skin Pass Fluids
Gardorol®	Corrosion Protection Oils
Gardo® Protect	Corrosion Protection Primers, Pretreatment Primers, Electrial Insulating Coatings, Primers, Topcoats
Oxsilan®	Multi-Metal Pretreatment, Passivating Agents
Permatreat®	Pretreatment Agents for Aluminium and Galvanized Steel

Excellence in chrome-free pretreatment
Permatreat® 1903

Chrome-free aluminium pretreatment

Permatreat® 1903 was one of the first chrome-free pretreatments for can-end stock and food container applications to be used in the marketplace. Today, even after so many years, it is still used in the manufacture of a significant proportion of the total global aluminium can-end stock. All major can manufacturers have globally approved Permatreat® 1903, and also key lacquer manufacturers support the innovative process.

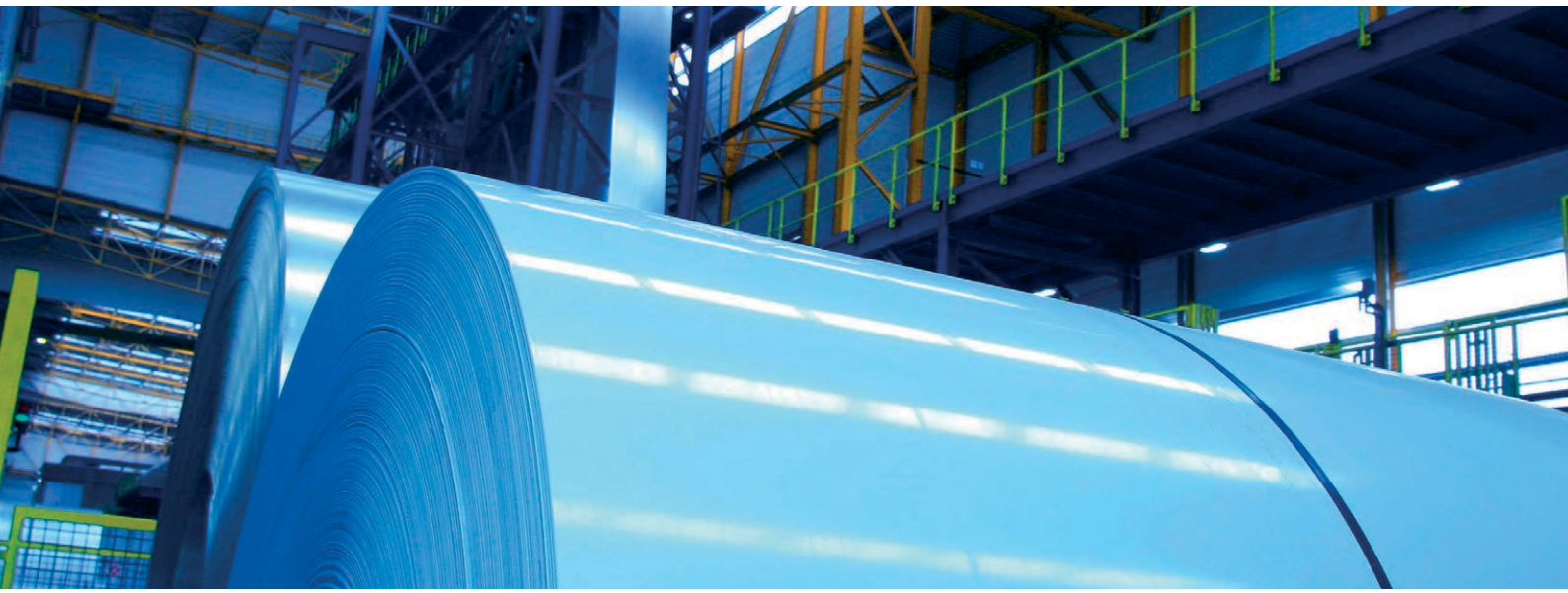
The process demonstrates outstanding performance with regard to adhesion and corrosion protection and shows similar or even better quality results than the conventional chrome phosphate. These excellent results have repeatedly been confirmed across a wide variety of lacquers (both solvent-based and water-based) in many detailed studies carried out by our customers.

Your Plus:

- Chrome-free technology
- No-rinse and conventional pretreatment process
- Performance equivalent to chrome-based applications
- Successful with a broad range of lacquers
- Can be applied by spray, immersion or roll-coat
- Fits into existing lines with only minor system modifications
- Approved by all major can manufacturers
- Approved by Nehring Institute (leaching test)

- More to read on www.chemetall.com/permatreat

Pretreatment prior to painting



Eco-friendly coil coating pretreatment

The pretreatment for coil coating is always performed in a number of steps. The first one is the cleaning of the metallic surface in order to remove grease, oil, and metal fines.
To reinforce the adhesion of the paint and hence improve corrosion resistance, the surface treatment consists of either a phosphating, chromating or an eco-friendly, chrome-free pretreatment process.

For all stages, Chemetall offers an extensive portfolio of high-performance technologies. We help our customers select the optimum process from our portfolio to suit their substrate and application technology as well as their intended use of the pretreated coil material.

Your Plus:

- Complete range of pretreatment technologies
- Eco-friendly, chrome-free and robust processes
- Conventional and no-rinse processes
- Enhanced corrosion protection and increased adhesion
- Easy control of coating weights
- Low chemical consumption
- Decrease in waste water treatment cost

- More to read on www.chemetall.com/pretreatment

Pretreatment Primer

To carry out high-quality application, Chemetall has invested in advanced laboratory equipment, such as the NIR curing device.

Two-in-one technology with clear advantages

A pretreatment primer, as the name implies, combines two technologies into one single application step. Without the need for additional primer paint and with only a low dry film coating weight, our pretreatment primers offer excellent corrosion resistance. The Gardobond® PC and Gardo® Protect processes also show very good adhesion to PUR foams and might therefore possibly replace the back-coat. The end results are significant process cost savings and overall process simplification.

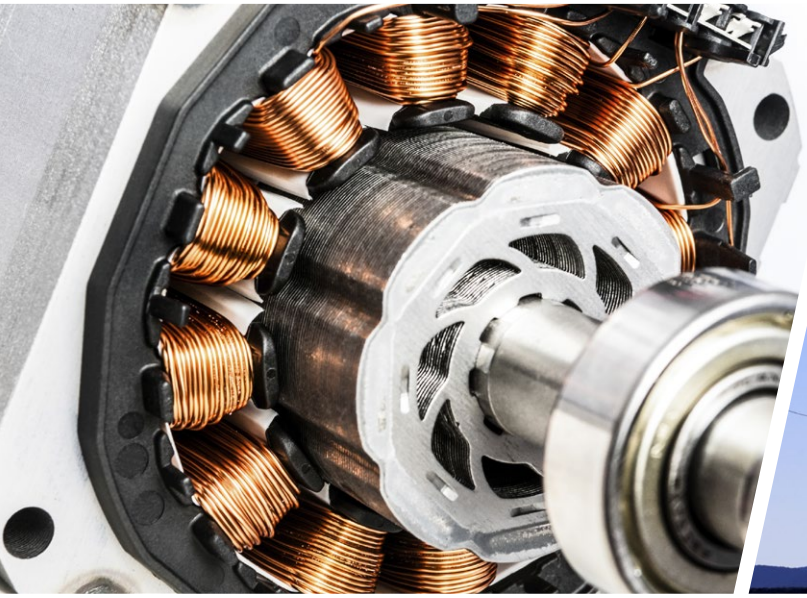
Chemetall's innovative pretreatment primer technologies are ideally suited for a variety of metal substrates and are compatible with common paints, such as polyester, polyurethanes, PVDF, and epoxy, for two or three layer designs.

Your Plus:

- Pretreatment and primer in one single technology
- Excellent corrosion resistance without primer paint
- Very good adhesion with PUR foams (sandwich panels)
- Significant process cost savings achievable
- Compatible with a range of paint systems
- Available in colored and pigmented versions
- Water-based (no organic solvent)
- Chrome-free and chrome-containing formulations available

- More to read on www.chemetall.com/pretreatmentprimer

Electrical Insulating Coating



Eco-sound one-component technology

With Gardo® Protect EC Hydro Chemetall has developed high-performing VOC-free and non-chrome insulating coatings for electrical steel. Designed to meet the non-grain oriented steel C3/C5 requirements, our one-component products provide excellent corrosion protection properties, a good abrasion resistance and high electrical resistance.

Electrical steel is a speciality steel which has excellent magnetic properties, high permeability and a small hysteresis area. The material is usually manufactured in the form of cold-rolled strips less than two millimeter thickness. These strips are stacked together and form the laminated core of transformers or the stator and rotor part of electric motors.

Laminations are cut to their finished shape by a punch and die. Our Gardo® Protect insulating technologies offer excellent adhesion during this process.

Your Plus:

- Designed for non-grain oriented steel C3/C5
- Water-based (upon request solvent-based)
- High corrosion protection
- Good abrasion resistance
- Annealing resistance (Gardo® Protect EC Hydro 500)
- Excellent adhesion during punching
- Color upon request
- Chrome-free one-component electro insulating coatings to meet C3/C5 requirements

- More to read on www.chemetall.com/electricalinsulatingcoating

Coil Coatings

"Finish first, fabricate later"

This statement describes in simple words the coil coating technology.

Nowadays, coil coated products are used in many industries. The largest market for coil coated steel and aluminum is the construction and architectural industry, where prepainted metal is used for roofs, facades, ceiling systems, gutters and a variety of ancillary components. Outside the building industry, coil coated metals are used in the transport sector and domestic appliance industry, as well as for furniture, doors and shutters.

Maximum performance

The use of prepainted metals is increasing daily. The coated coils offer excellent exterior durability: the complete system from substrate, pretreatment, primer and topcoat, is optimized for maximum performance. On top of that, the prepainted metals are equipped with an increasing number of long lasting special properties, which add functionality.

Chemetall's primer and topcoat processes play a major role in achieving high-class and durable coil coatings with a range of different properties.

Primer

The primer is applied as a first organic layer after the pretreatment. It assumes a protective function with regard to corrosion protection and acts as an adhesion promoter between the pretreated metal and the topcoat. The product is applied with a paint coater, while at the same time a back-coat is applied.

Topcoat

After the primer film has cooled down, the topcoat is applied in a process similar to the primer. The topcoat protects the metal strip against damage from external influences and provides the coil with certain characteristics.

High-class coatings to meet different requirements

Chemetall offers a wide specialized variety of coatings in a selection of colors which are resistant against corrosion, chemicals and weathering and offer good forming properties, elasticity, and scratch resistance. A required weldability is ensured by means of conductive pigments in the coating.

Chemetall coatings are based on a variety of polymers and can therefore meet the highest level of quality and durability required for coatings used in the architectural and domestic appliance market.

Your Plus:

- PE (polyester)
- PUR (polyurethane)
- PUR-PA (polyurethane-polyamid)
- PVDF (polyvinylidenefluoride)
- FP (fluoropolymer)

- More to read on www.chemetall.com/coilcoatings

Passivation

Excellent temporary corrosion protection

During transport and storage it is essential that the metal surface is protected from corrosion. The passivation technologies from Chemetall make an important contribution to effective corrosion protection between the manufacturing of the coils and their further processing. Our processes show very good resistance with regard to salt spray, humidity and stack tests and allow a good formability and post-painting.

The corrosion protection performance of the treated galvanized material depends on the passivation film thickness, the reactivity of the galvanized alloy and the application conditions in the galvanizing line. In recent years we have introduced hexavalent chrome-free formulations to the market, whilst at the same time still offering the more traditional passivation technologies based on chromates.

For special requirements such as high alkaline resistance (alkaline forming emulsions) combined with forming processes, adhesive bonding or post-painting, we can offer a tailored product portfolio.

Your Plus:

- Excellent corrosion protection during transport and storage
- Chrome-free and chrome-containing technologies
- Transparent passivation layer
- Salt spray resistance from 48 to < 120 h
- Resistance against forming emulsions
- Good post paintability

- More to read on www.chemetall.com/passivation

Permanent Coating

Chemetall operates laboratories that are excellently equipped, e.g. with a paint coater technology.

Colorful and eco-friendly solutions

Chemetall's thin organic Permanent Coatings improve the formability of metal sheets without the use of additional lubricating oils. The technology is designed for zinc-coated substrates like hot-dip galvanized steel, zinc-aluminium, aluminium-zinc and zinc-magnesium, but is also suitable for other substrates, such as cold-rolled steel, aluminium, and pure zinc.

Compared to conventional passivation technologies, our Gardobond® PC Permanent Coating technology offers significantly better corrosion resistance, shows good anti-fingerprint performance and excellent adhesion to PUR foams (sandwich panels). The Gardobond® PC product line offers both chrome and non-chrome technologies with color options available.

Your Plus:

- Chrome-free and chrome-containing technologies
- Water-based (no organic solvent)
- Different colors available
- Transparent, oil-free organic layer
- Excellent corrosion protection
- Anti-fingerprint properties (AFP)
- Resistance to mild alkaline cleaners
- Paintability (powder and liquid)

- More to read on www.chemetall.com/permanentcoating

New European regulations on chemicals
The impact of REACH and CLP

REACH is the European Community Regulation on chemicals and their safe use, which came into force on June 1, 2007. It applies directly and uniformly throughout the European Union and makes great demands on manufacturers, importers and users of chemicals. In order to meet the regulations of REACH and CLP, Chemetall has established a dedicated team.

To comply with the REACH initiative (**R**egistration, **E**valuation, **A**uthorization and Restriction of **Ch**emical Substances), we have established a central REACH group in Frankfurt/Germany. For Chemetall companies located outside the EU and exporting directly to the EU, Chemetall GmbH was appointed as the „Only Representative" to fulfill the REACH requirements. Therefore, customers of Chemetall are not importers under the regulation, but instead are regarded as downstream users.

To ensure continuity of delivery to our customers, we pre-registered all relevant substances that require registration at the European Chemical Agency (ECHA). Building on these pre-registrations, we intend to register all relevant substances by 2018. As part of the registration process, the uses for chemical substances must be identified and detailed according to ECHA Guidance. We are working closely with our customers and associations to ensure all uses for our chemistries are registered and detailed.

The goal of REACH is to ensure a higher level of protection of human health and the environment, and to establish an extensive risk assessment for the complete life-cycle of chemicals, involving the complete value chain. With REACH a uniform system is established providing information on registration of new notified substances and risk assessment for existing substances.

GHS – Globally Harmonized System

GHS provides a unified system to identify and to communicate hazards related to transporting and supplying chemicals across the world. The regulation describes criteria for the classification and labeling of substances and mixtures, its goals being the following:

- to ensure a higher level of protection of human health and the environment,
- to enhance free trade, competitiveness and innovation.

The more countries all over the world implement the GHS criteria in their legal system, the more valuable it becomes for all companies.

CLP – Implementation throughout the EU

The CLP Regulation will ultimately replace the current rules on **C**lassification, **L**abeling and **P**ackaging of Substances (Directive 67/548/EEC) and Preparations (Directive 1999/45/EC) after the transitional periods given in the regulation, and Chemetall will meet the deadlines for classification and labeling described in it. Several substances have already been classified and labeled according to the CLP regulation by December 1, 2010. The transitional period for mixtures ends on June 1, 2015.

Chemetall's Product Safety group, which is supported by EHS responsible persons in every legal entity, is intensively working on implementing the requirements resulting from the REACH and CLP regulations.

Expect more working with a leading supplier of surface treatment technologies. Chemetall is familiar with the legal, quality and environmental requirements and globally coordinates all its activities. Working with Chemetall, you can rely on a reliable, strong and innovative partner for sustainable success.

- More to read in our GHS brochure or on www.chemetall.com

Chemetall at a glance

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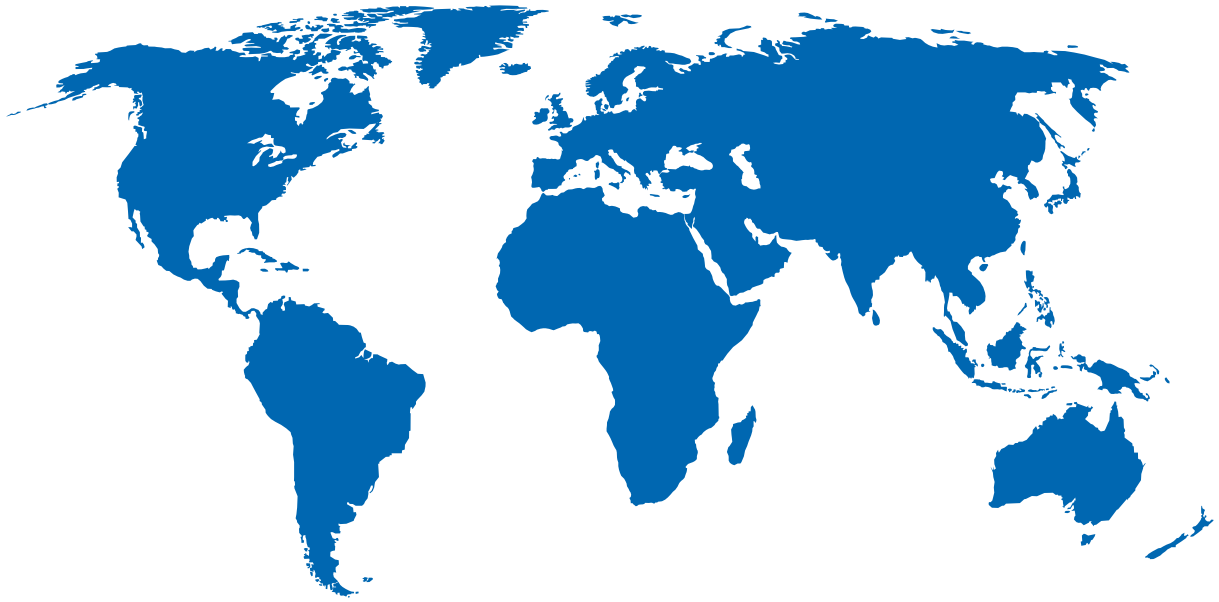

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