



Gardo®Flex:
The advanced zinc-phosphate technology
for the automotive industry.

Chemetall
expect more⁺

Flexibility perfected

Customized zinc-phosphate technology



The Gardo®Flex pretreatment technology offers many advantages for the automotive industry: it combines the traditional benefits of a conventional zinc-phosphate technology with today's demands for a multi-metal process with unlimited throughput of aluminium substrates. Easy to implement, Gardo®Flex ensures a high cost efficiency in production.

The increasing mix of metal substrates used in automotive manufacturing, notably the use of lightweight construction materials such as aluminium and also increasing volumes of high-strength steels and zinc-magnesium, is imposing new challenges on the traditional pretreatment process. Furthermore this is compounded by demands to meet ever more stringent environmental requirements, increasing pressure on costs and the need to comply with the specific quality standards of the global automotive industry.

Modules allow for process economics

Gardo®Flex combines the traditional benefits of a conventional zinc-phosphate technology with enhanced process components. The significant advantage of the new system lies in the large number of high-performance modules available for the pretreatment process. The combination of the modules depends on the substrate throughput, the plant technology available, local market conditions and legal regulations.



Reduced minimum
phosphate time

Less waste
water

Meet challenging
customer specs

No limitation in
Al throughput

Low
temperature

Silane-based
passivation

Low coating
weights

Less
maintenance

Reduced
etching rate on Al

Customized pretreatment

Choosing and combining the optimal modules for each production line is key to meeting the high quality demands of the global automotive industry. Thus, for every step in the zinc-phosphate process, Chemetall offers effective technologies – from cleaning and degreasing (i.e. demulsifying operations) to activation and phosphating through to the final rinse.

High-quality multi-metal pretreatment

The Gardo®Flex technology is suitable for any multi-metal applications. It can be used for the processing of all standard metal substrates in the automotive industry. There are no limits with regard to the throughput of aluminium substrates. And on high-strength steel it can significantly improve the resistance to corrosion.

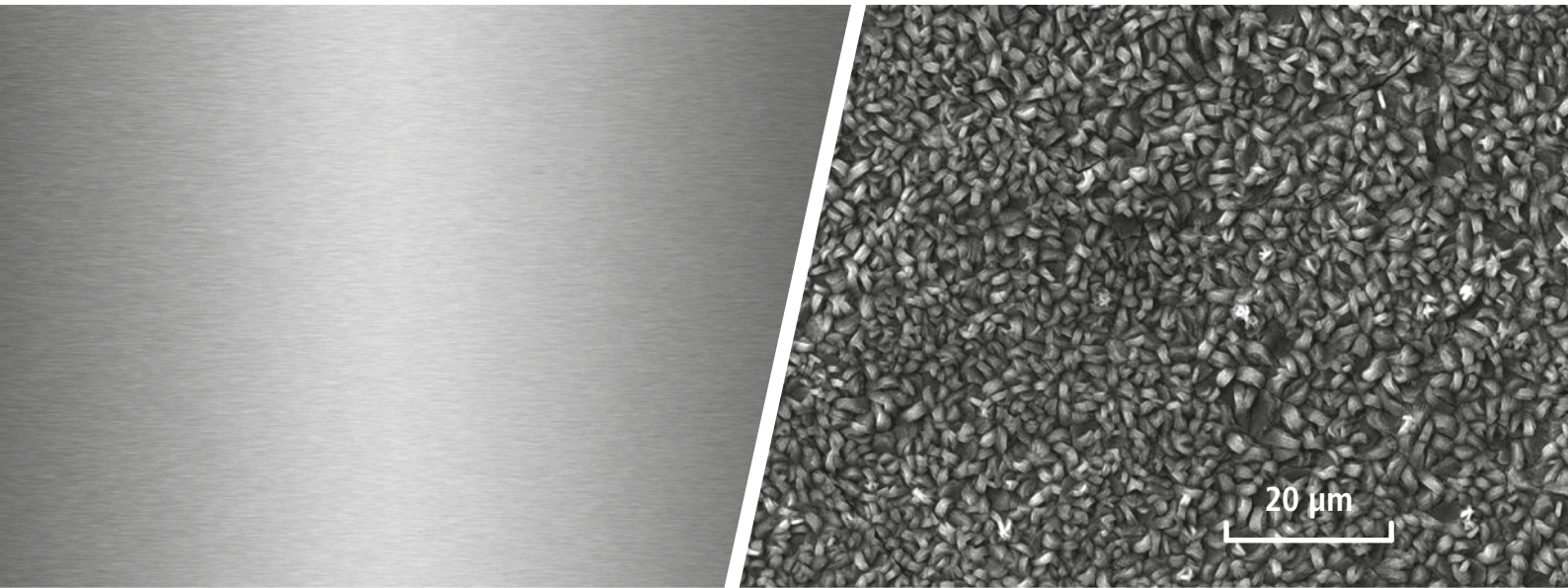
Approved flexibility

Gardo®Flex meets today's market requirements, including even the most challenging test specifications of the leading car manufacturers. As the technology is easy to implement in existing production lines, many automotive customers have already benefited from the high flexibility and quality of Gardo®Flex.

➤ Read more about it at:
www.chemetall.com/gardoflex

Multi-metal pretreatment

Unlimited aluminium throughput



6014 substrate without zinc-phosphate coating ...

... and protected by fine-crystalline Gardo®Flex Technology (SEM image)

The increasing amount of aluminium substrates used in automotive production requires adapted pretreatment systems which ensure a high-quality coating before painting. Gardo®Flex is designed for high-quality multi-metal applications with no limitation on the treatment of aluminium substrates.

In some cases up to 70 percent of lightweight aluminium is pretreated in the automotive production plants – a fact that may lead to the technically most demanding application when using a conventional zinc-phosphate process. The modern Gardo®Flex zinc-phosphate technology is, by contrast, suitable for multi-metal applications including unlimited throughput of aluminium substrates.

Less fluoride, less sludge

On aluminium substrates, Gardo®Flex ensures a reduced pickling loss on the metal surface. This significantly minimizes the consumption of fluoride-containing additives by up to 40 percent. Also the phosphate sludge volume is dramatically reduced, which leads to less maintenance work and less disposal costs.



Thin phosphate layer on aluminium

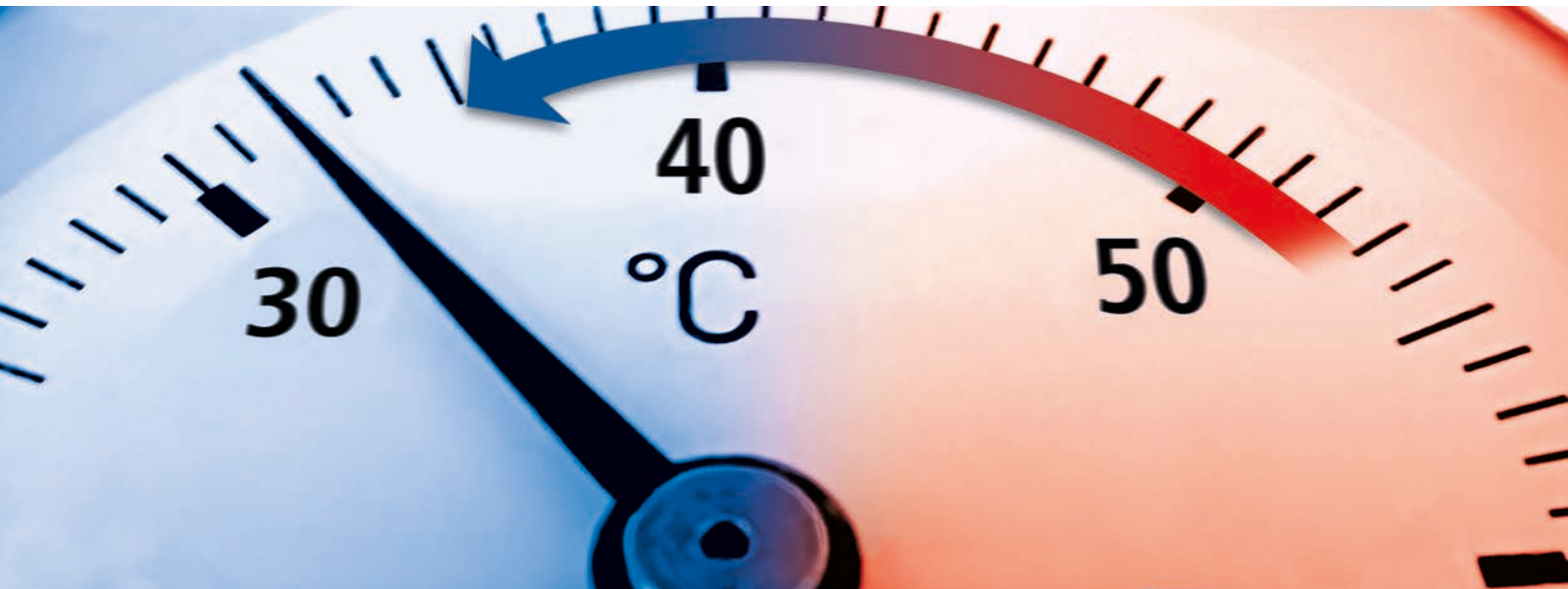
One of the strengths of Gardo®Flex is the deposition on a uniform thin phosphate coating on the aluminium substrate, regardless of the percentage of aluminium in a car body. This phosphate coating smoothens out minor irregularities from previous process steps and thereby supports an even deposition of the e-coat.

As the formation of a phosphate coating on aluminium substrates is specifically desired, there is no need for expensive cooling of the activation or rinsing tanks, in order to suppress the formation of phosphate crystals. An additional passivation step is optional, but in most cases not required to fulfill automotive specifications.

With only a zirconium passivation on aluminium, surface defects resulting from car body construction or pressing, such as for example scrub marks, scratches or impressions from the vacuum cups of the robots, can lead to visible problems in the cathoretic paint layer. As a consequence, extra sanding operations may be required. These inconveniences can be reduced with the Gardo®Flex technology.

Cost-efficient process

Less energy, less chemicals, less phosphate sludge



No matter whether the target is an improved performance of the phosphate coating, an increased throughput of aluminium substrates or simply significant process cost savings of up to several Euros per car body, with Gardo®Flex and its wide choice of process modules, all customers can benefit from a tailor-made, flexible and easy-to-operate pretreatment system.

Besides its multi-metal capability, Gardo®Flex offers additional advantages with regard to process cost optimization. This includes energy and chemical consumption savings, and also reduced maintenance and phosphate sludge disposal costs. A distinctly longer bath life, meaning lower water consumption and smaller effluent volumes, contributes to the resource-saving aspect of this technology.

Lower energy consumption

Field experiences have shown that savings in energy costs in the six digit range can be gained by using the Gardo®Flex technology. Running the pretreatment at a lower temperature is not only possible for steel substrates, but also for multi-metal processes including aluminium. Several automotive manufacturers are already running their zinc-phosphate process at 35°C or even less.



Faster quality coating

Even with a shorter phosphate time, the system generates fine-crystalline, high quality phosphate layers, avoiding any flash corrosion. The reduced coating weight on the metal surface requires less replenishment solution and leads to a lower amount of chemical consumption.

Less and easy-to-remove sludge

Gardo®Flex produces less sludge than a conventional zinc-phosphate process, and not only that, but the sludge is soft and therefore easy to remove. Clogged pipes, extensive maintenance work and tons of sludge are now things of the past.

Proven multi-metal pretreatment

Working closely with our automotive customers, Chemetall's technical experts around the world have determined the optimal Gardo®Flex solution for each individual pretreatment process. More and more car manufacturers worldwide now rely on the Gardo®Flex technology, which offers them a high level of flexibility in their pretreatment process, excellent quality and reduced process costs.

Expect more with less...

- + tank make-ups
- + waste water
- + chemical consumption
- + phosphate sludge
- + line descaling and maintenance
- + process costs

- + Read more about it at:
www.chemetall.com/gardoflex

Chemetall at a glance

Chemetall is a leading global surface treatment company, headquartered in Frankfurt, Germany. With our 2,100 employees, 40 subsidiaries and 22 production sites, we are a financially strong and fast growing company with a long-term orientation. Our aim is to further strengthen our quality and innovation leadership. With our own sales offices, production facilities, service teams, laboratories and warehouses at locations all around the world, we are operating in close proximity to our customers.

The chemical treatment of metal surfaces is our core competence: Our products are developed for cleaning, giving corrosion protection, sealing, improving paint adhesion, and facilitating the forming and treatment of metals. Our globally established technologies are used in the most diverse industry sectors and have played a leading role in shaping metal treatment.



**Headquarters and
Regional Head Office
Europe, Middle East, Africa,
South America**
Chemetall GmbH
Trakehner Straße 3
60487 Frankfurt am Main
Germany
Phone: +49 (0) 69 7165-0
surfacetreatment@chemetall.com

**Regional Head Office
North America**
Chemetall US, Inc.
675 Central Avenue
New Providence, NJ 07974
USA
Phone: +1 908 464 6900
chemetall.americas@chemetall.com

**Regional Head Office
Asia-Pacific**
Chemetall Asia Pte Ltd.
12 Loyang Crescent
Singapore 508980
Phone: +65 6885 7900
cm.asia@chemetall.com

www.chemetall.com

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