

INSIGHT



TAKE A LOOK INTO THE WORKINGS OF FASTENER COMPANIES

Full coating service from Growermetal



From mechanical zinc plating to zinc flake coatings, Growermetal can offer customised solutions suitable for the needs of different industries – supported by in-house facilities that create new opportunities of personalisation for customers worldwide.

When it comes to safety washers, details count, which is why Italian washer manufacturer Growermetal SpA ensures it studies, designs and tests the most suitable solutions for every application – taking into account every aspect of production. A key point in this process is choosing the right surface treatment, which can determine the effective performance of the safety washer in the most challenging conditions. At the same time, the most suitable coating is essential in creating long-lasting products, protecting them from corrosion and boosting fastener quality.

For a leading manufacturer of safety washers, spring washers, and bended parts, like Growermetal, every surface treatment or coating plays an essential role in many different fields – including automotive, railway, aerospace, construction, electromechanics, power generation, and many others, each of which have different needs or application conditions.

“Technical know-how, quality control, and a deep knowledge of materials, have to be aligned to provide the best solutions and punctual, flexible and efficient answers to customers’ requests,” states Paolo Cattaneo, CEO of Growermetal. “Since Growermetal was established in 1950 we have been committed to creating a completely in-house manufacturing process, focusing our energies and resources in creating an internal system able to offer a full spectrum service to local and international partners.”

In addition to outsourced processes such as galvanic zinc plating, zinc-nickel plating, nickel plating, copper plating and phosphating, Growermetal provides two extra in-house coatings – mechanical zinc plating and zinc flake coating, with two production lines specifically designed to process washers and flat parts.

Mechanical zinc plating

The mechanical zinc plating is a high-quality and high performance anticorrosive coating, free from hydrogen embrittlement risks. Zinc powder is applied on the surface of the

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pieces through a process made in the presence of glass spheres and in an appropriate chemical environment, without the utilisation of electric power or further heat induction.

“Since 2009 Growermetal has been carrying out the mechanical zinc plating internally, inside its modern plant and using exclusively original MacDermid® chemicals, which have been studied on purpose to get an excellent coating,” mentions Paolo. “This process earned Growermetal the ‘Technology and Innovation’ award at the Surface Expo in 2010 – the Italian trade fair dedicated to surface finishing and treatments.”

After winning this award, and being included among the homologated platers for the Zinklاد 250M surface treatment, in 2016 the process received another acknowledgement and Growermetal was approved for the mechanical zinc plating process according to the automotive standard FCA PS.50042 – as a unique plater in the Europe, Middle East and Africa (EMEA) markets. This allows Growermetal to add a superior quality to its range of washers, and also to meet the needs of third parties – making the treatment available for its products.

All the benefits of mechanical zinc plating

So what is the added value of Growermetal’s mechanical zinc coatings? The answer is multifaceted and ranges from the uniformity and absence of flaws at the structural and physical level, to the quality of the actual performance and its durability. Benefits include:

- + **Absence of hydrogen embrittlement:** The process eliminates the risks of breaking and is extremely effective in preventing hydrogen embrittlement.
- + **Elimination of sticking pieces:** Thanks to the nature of the mechanical zinc plating, during the process there is no risk of sticking parts.
- + **Coating thickness uniformity:** Mechanical zinc plating is applied with coverage of all parts and surfaces of the washers, obtaining a uniform coating without any build-up thickness even on protruding points. »

EVOLVING TECHNOLOGIES FOR IMPROVED FASTENING SOLUTIONS



going ahead.

Expertise, innovation and research are essential to realize cutting-edge fastening systems.

Thanks to our R&D laboratory, we bring new technologies to life, studying the most suitable designs and improved characteristics for your applications.

Special shaped blanked and bended parts, high thickness and precision flat washers, EPDM moulded part projects and parts with glued EPDM inserts are the latest fastening technologies introduced in the range.

Discover what's next.



- » **+ No de-tempering:** The process is carried out at room temperature, therefore mechanical zinc plating does not de-temper heat treated parts, avoiding modifications of the hardness during the process.
- + Excellent corrosion resistance:** The mechanical zinc plating offers an outstanding corrosion protection with an excellent coating adhesion – providing a superior resistance in comparison with other surface coatings.
- + Electrical conductivity:** The mechanical zinc plating guarantees a very good electrical conductivity, making the coating perfectly suitable for electromechanical applications.
- + Environmentally friendly process:** Thanks to its low energy consumption process, and to Growermetal's modern water depuration and recycling system, mechanical zinc plating guarantees a low environmental impact – in compliance with the ISO 14001 standard specifications.

Zinc flake coatings

In 2016 Growermetal installed a new and fully automatic coating line, which boosted the flexibility of the company in supplying products with zinc flake coatings. The coating line for zinc flake surface treatments has been designed for carrying out the surface coating on washers, with many benefits both from the aesthetic point of view and the performance.

In addition, this investment has enabled Growermetal to reach the best results and make its services more competitive, merging a versatile range of high-quality coatings with the ability to accomplish the requests of customers in shorter times, thanks to the in-house processes.

Today the company uses exclusively original DÖRKEN products, which ensure high-quality and high performance coatings, by providing a choice of different solutions of basecoat (e.g. Delta-Protect® and DELTA®-TONE range) and top coat (e.g. Delta-Protect® VH range).

“Among the many results reached by the partnership between Growermetal and DÖRKEN, in 2020 the German Railway (Deutsche Bahn) approved the Delta-Protect® KL100 coating on Growermetal's double coiled spring washers, produced according to UIC 864-3,” points out Paolo. “Widely used for railway applications, these washers are usually exposed to challenging weather conditions and extreme vibrations. The zinc flake coating system of Delta-Protect® KL100 offers a superior corrosion resistance, without adhesion issues during stress or reduction in anti-loosening performance.”

The main benefits of a zinc flake system

The application of a zinc flake coating is carried out through immersion, centrifugation followed by polymerisation. The excellent corrosion resistance is achieved by the mechanisms of cathodic protection; the wall-effect generated by the flakes of zinc and aluminium; and the reaction of the binders with the base metal.

This leads to a coating characterised by:

- + High cathodic protection level** – thanks to zinc flake coating acting like a barrier.
- + Long-term corrosion resistance** – with delayed formation of rust.
- + Extremely thin and uniform surface layer thickness** (8µm – 12µm) with the maximum protective effect.
- + High resistance to chemical products, environmental influences and mechanical impacts** – protecting the component.
- + No presence of hydrogen embrittlement** – during the coating process no hydrogen is generated, so no stress corrosion cracking occurs.
- + Keeping the electric conductivity** – and full respect of the mechanical features of the base material.
- + Possibility to modify the friction coefficient** – according to the requirements.
- + Cr6 free – RoHS/ELV and Reach compliant** – meeting the highest quality standards.

A network of services and experienced professionals

The positive results reached by Growermetal are boosted by its in-house surface treatments, with a synergy between the different departments involved in the manufacturing process. Among them, the heat treatment process allows the company to change and transform the microstructure of raw materials, improving their characteristics and ensuring the maximum control of the parts. This aspect helps Growermetal to reach higher safety performance against loosening of the washers produced and provide a customised process to all its partners.

“Thanks to the in-house structure, customers are involved in the different stages of the manufacturing, working side by side with the company's technicians and engineers. The latter are essential in selecting the best raw materials and suggesting the most recommended and functional treatments for every application,” concludes Paolo. “In order to maintain a truly competitive service, cooperation and dialogue are essential values at every step in the manufacturing. Following the path of innovation, expertise, and efficiency, we wish to build a more functional system, giving attention to every detail.”

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