



Press Release

November 30, 2017

The turning of the screw in metal pretreatment for cold forming operations

One-step Bonderite L-FM FL polymer-based coating process changes the game in metal pretreatment for demanding automotive bolts

Düsseldorf, Germany – Henkel Adhesive Technologies has sharpened the market fit of its Bonderite L-FM FL portfolio of polymeric coatings for the surface conversion of metals used in cold forming operations. The optimized Bonderite L-FM FL process reduces the number of treatment steps from as much as ten to one or two and is fast emerging as an attractive alternative in the production of high-performance automotive bolts and screws.

Medium carbon or alloy steel grades designed for cold formed threaded fasteners in property classes such as 8.8., 9.8, 10.9 and 12.9 to require a prior surface conversion process to create a thin, adherent coating that will facilitate deformation and ensure the high quality of the final products. In automotive industry, these cold formed screws and bolts are used in a wide range of engine, powertrain, suspension, wells and other demanding applications.

Traditional zinc phosphating and reactive soap processes, although well established in metal pretreatment for cold deformation, are associated with a number of potential drawbacks, including high acidity as well as high energy consumption and phosphate sludge. Moreover, they can involve up to ten individual steps, from initial degreasing and pickling to activation, phosphating and soaping with frequent intermediate rinsing.

“With Bonderite L-FM FL, Henkel has developed an innovative solution to all these challenges that provides a flexible one-step process with superior cost performances, reduced CO₂ impact and a much smaller water footprint,” says Emilio Bucci, Henkel’s Business Development Manager for Cold Forming in Europe.



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Inherently more sustainable

Bonderite L-FM FL is a non-reactive, water-based polymeric coating that enables a sustainable surface conversion process. Since the coating adheres to the surface physically without any reaction, the only evaporates produced in the subsequent drying step prior to cold deformation are aqueous. As a one-step process, Bonderite L-FM FL eliminates all rinsing steps, which saves water, and also has a reduced energy demand with appropriately lower CO₂ emissions. Furthermore, when the cold formed screws are dephosphatized for final heat treatment, the polymeric coating is easier to remove, which permits the use of a dephosphating cleaner in much lower concentration, which means less consumption.

Significantly more cost-efficient

In addition to these environmental benefits, the Bonderite L-FM FL technology is characterized by its greatly reduced complexity over zinc phosphating. As a single-bath process, it minimizes equipment footprint and maintenance. Raw material surface properties require initial sand blasting or pickling and neutralizing, but the conversion cycle is essentially simplified to one single step and operates at a temperature between 40°C and 50°C, providing significant time and energy cost savings. Overall productivity is also enhanced by the excellent lubricity and pressure resistance of Bonderite L-FM FL in comparison with traditional zinc phosphating processes, which results in longer extrusion die life and has been confirmed in numerous industrial-scale applications.

Easily integrated in any production line

“With its proven cost advantages and sustainability, Bonderite L-FM FL is considered the single most efficient and responsible surface pretreatment process in metal cold forming and is fast emerging as the industry’s preferred technology especially in the global market segment of demanding automotive bolts,” Bucci notes and adds: “The simplicity of the process also means that it can easily be integrated in in-line as well as in batch production lines.”

To help cold forming manufacturers maximize the productivity of their Bonderite processes, Henkel recommends the use of its dedicated Lineguard Automatic Line Control system. Lineguard is available in modular hardware and software configurations that enable precise and efficient bath management up to fully automated pretreatment control. It features state-of-the-art PLC, sensor and HMI technology that is seamlessly integrated by the company’s specialists to provide a total system solution tailored to each customer’s individual needs, including process data acquisition and comprehensive documentation.

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About Henkel

Henkel operates globally with a well-balanced and diversified portfolio. The company holds leading positions with its three business units in both industrial and consumer businesses thanks to strong brands, innovations and technologies. Henkel Adhesive Technologies is the global leader in the adhesives market – across all industry segments worldwide. In its Laundry & Home Care and Beauty Care businesses, Henkel holds leading positions in many markets and categories around the world. Founded in 1876, Henkel looks back on more than 140 years of success. In 2016, Henkel reported sales of 18.7 billion euros, adjusted operating profit of 3.2 billion euros. Its three top brands, Persil (detergent), Schwarzkopf (hair care) and Loctite (adhesive) generated more than 6 billion euros in combined sales. Henkel employs more than 50,000 people globally – a passionate and highly diverse team, united by a strong company culture, a common purpose to create sustainable value, and shared values. As a recognized leader in sustainability, Henkel holds top positions in many international indices and rankings. Henkel's preferred shares are listed in the German stock index DAX. For more information, please visit www.henkel.com.

Photo material is available at www.henkel.com/press.

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The following material is available:

Cold Forming



According to this treatment line configuration the maximum benefits of Bonderite L-FM FL process are achieved: less complexity, no disposal, no water consumption, minimal maintenance and competitive process cost.

Cold Forming



Bonderite L-FM FL technology is designed also for existing acid pickling line, in this case process steps reduced from 5 to 3 while retaining all other benefits such as no disposal, less energy consumption, less water consumption, competitive process cost.



With Bonderite L-FM FL, Henkel has developed an innovative solution with superior cost performances, reduced CO2 impact and a much smaller water footprint.



Bonderite L-FM FL is a water- based polymeric coating that enables a sustainable surface conversion process.



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The simplicity of the process also means that it can easily be integrated in in-line as well as in batch production lines.



Bonderite L-FM FL portfolio of polymeric coatings is used for the production of metal working parts such as screws.