

Press Release

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Robust and reliable bonding process for non-heat-treated light alloy castings

Henkel set to unleash the full potential of its casting value chain expertise

Henkel offers an especially high-performance portfolio for the casting value chain, with capabilities for both the powertrain and structural component segments. The company provides optimized chemicals for each step of its customers' manufacturing process: initial casting, machining, cleaning, impregnation, surface treatment and assembly.

With the acquisition of Acheson as part of the ICI National Starch business in 2008, Henkel has at its disposal decades of expertise in die-casting and service products for the die-caster. Its release agents are tailored to modern foundries' needs to enhance process management and stability, with further development and optimization ongoing. The subsequent machining and grinding operations are supported by Henkel's bio-stable cutting fluids. These require the lowest possible concentration, yet will also effectively preserve tools and lengthen die life. Complementing its cutting fluids, Henkel's cleaners will wash off any residues and prepare the surface for the subsequent process stages (e.g. pickling, passivation) as well as boosting corrosion protection.

Henkel Loctite Impregnation Systems provides porosity sealing products and services. In case porosity plays a role and sealing of the surface is required – Henkel offers impregnation services both off site in a Henkel service center or directly at the customer's site. Henkel also provides a wide range of functional coatings for surface



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treatment to enhance corrosion protection or prepare the casting for the next operation. Finally, for the assembly stage, Henkel offers adhesives, sealants and threadlockers as well as film lubricants to facilitate the integration process, whether by bolting or welding.

As a logical extension, Henkel also now sees a unique possibility of introducing its integrated product range for the body-in-white and chassis market where even more sophisticated requirements apply. This further leverages the potential of the company's diverse portfolio, with full integration geared to the final manufacturing process to ensure that the chemical formulations individually applied along each stage of the casting value chain are fully aligned to achieving the desired end result.

“It was obvious in hindsight,” says Bjoern Lorenz, Sales Manager Metal Forming, Henkel Adhesive Technologies, “to take our existing whole-process expertise to the next level of performance. With our understanding of the requirements inherent in each stage of the casting value chain, we realized how useful it would be to further interweave the disciplines involved for enhanced customer benefit.” Since Henkel is already able to offer extensive expertise in all three key areas – casting, surface treatment and (structural) adhesive bonding, the casting value chain has now also become a focus for its lubricant development work as well.

All process chemicals applied along the casting value chain are thus no longer developed in isolation, but rather strictly aligned to the subsequent steps and requirements of the process. With the support of its scientific research laboratory in Düsseldorf, Henkel is capable of analyzing cast parts and alloys to determine the most suitable casting lubricant and other chemicals so as to ensure, for example, bonding with maximum adhesion, or a smooth KTL coating.

This service is now available for customers that cast aluminum and magnesium parts. Typically, Henkel will first analyze the alloy and the specifications of the part that the customer intends to cast. A so-called small line audit offers the Henkel experts key insights in determining their approach to the analytical process, with the above disciplines being brought into play as the body of data grows. A concise report

is then submitted to the customer by those same Henkel experts so as to finally determine exactly what process chemicals are required and which parameters need to be applied in order to ensure the necessary process robustness.

Several customers have already benefited either directly or indirectly from this holistic concept – be it through a smoother KTL coating on their magnesium castings, be it through the elimination of prior non-compliance issues and improved corrosion protection thanks to precise definition of the requisite release agent, or be it in preparation of the cast aluminum parts to allow for subsequent bonding to a vehicle's frame. Especially in the case of components that are no longer heat-treated, a sound scientific understanding of all the process chemicals involved, from release agent to bonding adhesive, is essential if the customer is to be provided with a viable solution. Henkel's unique expertise in relation to casting, cleaning, surface treatment and adhesive bonding is further enhanced by its ability, as a worldwide supplier of several key process chemicals, to provide the requisite in-depth analytical skills along the value chain. Having its own central analytical department with the most modern of equipment for chemical, metallographic and metallurgical analysis enables Henkel to assess a part's macrostructure and even gain insights into a material's microstructure at nanometer to micrometer depths, making it the perfect partner for the die-casting industry.

As time goes on, moreover, the demand for bonding in particular is likely to soar. Edmund Hinkel, Casting Segment Sales Expert, Henkel Adhesive Technologies, explains: "Once heat treatment has been eliminated from the production process, having a reliable partner that understands the ins and outs of the entire value chain and has the strong support of an analytical department will become of key importance for business success. Without heat treatment, the process chemicals need to be perfectly matched right down the line, yet offer customizable modularity. Having one supplier able to offer all those process chemicals backed up by extensive in-house expertise simplifies the casting-to-bonding process while also ensuring effective process management."

Loctite is a registered trademark of Henkel and/or its affiliates in Germany and elsewhere.

Henkel operates worldwide with leading brands and technologies in three business units: Laundry & Home Care, Beauty Care and Adhesive Technologies. Founded in 1876, Henkel holds globally leading market positions, both in the consumer and in the industrial businesses, with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel employs almost 50,000 people and reported sales of 16.4 billion euros and adjusted operating profit of 2.6 billion euros in fiscal 2014. Henkel's preferred shares are listed in the German stock index DAX.

Photo material is available at <http://www.henkel.com/press>

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