

Press Release

11 May 2016

Excellent forming behavior of phs-directform®

The voestalpine development of phs technology is in a class of its own. The press-hardened steel can be produced using both the indirect and direct hot-forming method and is becoming the innovation driver of the industry. The forming behavior of the material goes beyond expectation.

Prototyping and testing tools were used to produce a variety of different component geometries during the development of phs-directform®, including A and B pillars, cross members, side members and other stiffeners.

Many of these components pose big challenges in forming but have impressively proven that the formation of microcracks as described in the literature can be eliminated in hot-formed galvanized materials. phs-directform® also performed extremely well in all of the tests with respect to forming behavior when compared to the currently available standard hot-forming coatings.

Zinc coating with optimized tribological properties

The performance of the new phs technology was especially impressive with regard to avoidance of local expansion and crack initiation. The good tribological properties as well as the zinc coating are among the most important product advantages. When compared to standard hot-forming coatings, the phs-directform® coating features half as high a friction coefficient and substantially reduced coating hardness. This leads to significantly reduced tool wear. Tests conducted at universities have confirmed these observations.

Fewer maintenance downtimes and much more

Fewer maintenance downtimes, lower tool material requirements and greater freedom of design in component development are further phs technology advantages worthy of mention.

Hot forming processes

Direct hot forming process

Ultra-high-strength components with cathodic corrosion protection and highest dimensional accuracy can now be manufactured using the direct process. Blanks made of phs-directform® are heated to approximately 900 °C until the initial geometry has been achieved. They are then cooled in a precooling unit to below 600 °C. In the final forming and hardening process, the geometry of the blanks is finalized in a cooled tool in a single step. The direct method optimizes the amount of material required and is the suitable process for smaller numbers of pieces and more simplified component geometries.

Indirect hot forming process

In indirect processing, blanks made of phs-ultraform® are formed and cut to final geometry using conventional cold-forming technologies. The cold-formed components are then heated to approximately 900 °C. In hot condition, the component is hardened and the geometry finalized through cooling in the press in the so-called form-hardening process. The indirect press-hardening process is especially suitable for very large or complex components.

Steel Division

The Steel Division is the largest division in the voestalpine Group and employs roughly 11,000 staff members. It produces high-quality flat-steel products, which is the core business of voestalpine. The parent company is voestalpine Stahl GmbH in Linz, a leading steel producer in Europe. The Steel Division is one of the leading steel producers of Europe. The Steel Division delivers to and consults customers in the automotive, construction, mechanical engineering, household-appliance, tube, section and energy industries. The portfolio of the Steel Division covers the entire range of high-quality steel strips: hot-rolled and cold-rolled, electrogalvanized, hot-dip galvanized, organic-coated.

Metal Forming Division

The Metal Forming Division in the voestalpine Group generated revenue of 2.3 billion euros and an operating result (EBITDA) of 331 million euros in the 2014/15 fiscal year. The division employs roughly 10,500 staff members and supplies almost all European automotive manufacturers. It is the center of competence in the voestalpine Group for sophisticated section, tube and precision-strip steel products and for ready-to-install system components made of pressed, punched and roll-formed parts. With an industry-unique combination of material and processing expertise and worldwide presence, the division is the partner of choice for innovative and quality-oriented customers.

The voestalpine Group

The globally active voestalpine Group is a steel-based technology and industrial-goods enterprise. voestalpine is represented by roughly 500 Group companies and locations in more than 50 countries on five continents. It has been listed on the Vienna Stock Exchange since 1995. With its highest-quality products, the Group is one of Europe's leading suppliers to the automotive, household-appliance and oil and gas industries worldwide. voestalpine is also the world market leader in switch technology and special rails, tool steel, and special sections. In the 2014/15 financial year, the Group generated revenue of 11.2 billion euros and an operating result (EBITDA) of 1.5 million euros. The Group today employs roughly 47,500 staff members worldwide.

Please direct your questions and comments to

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