Corrosion-Resistant Alloy Now Set for Sand and Permanent Mold Casting

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Delphi advances its previous development to provide an option for wider adoption of lighter-weight castings.

Delphi Automotive LLP manufactures mobile electronics and transportation systems for cars, trucks, and commercial vehicles — and through its Delphi Technologies Inc., it develops new automotive materials. DTI is a wholly owned Delphi subsidiary responsible for licensing and commercializing products such as K-Alloy SP.

Specifically, DTI has developed an aluminum alloy with “designed-in” corrosion resistance. While KAlloy has been commercialized for diecasting for over five years, Delphi now offers K-Alloy SP for sand casting and permanent mold casting operations.

Salt-spray testing over 3,000 hours resulted in no metal loss on K-Alloy components, as seen in comparison here with a component cast from a standard aluminum alloy. The alloy originally commercialized for diecasting has been made available now for sand casting and permanent mold casting.

Aluminum alloys are an obvious advantage to automotive designers seeking to lighten their designs in the cause of greater fuel efficiency, and aluminum automotive components typically achieve significant weight savings for lighter vehicles. But, exposing aluminum or aluminum alloys to harsh environment conditions risks corrosion—which may lead to product or system failure.

K-Alloy was developed and patented to produce more robust, diecast aluminum components for under-hood applications where salt corrosion, heat, vibration, and shock often degrade material, increasing warranty costs for the manufacturer. Delphi has described the alloy as having “designed-in corrosion resistance,” millions of K-Alloy parts have been produced and installed since 2003.

“The original K-Alloy continues to provide aluminum diecasting with exceptional corrosion resistance results in vehicle engine electronics, sporting goods, outdoor lighting, furniture and mail boxes, just to name a few. But K-Alloy SP allows us to work with an expanded set of users that utilize permanent molds and sand casting in their process,” according to Delphi Technologies Inc. director Timothy Forbes.

The new alloy is said to proved the same benefits as the original K-Alloy, not only resisting corrosion but also eliminating expensive post-production treatments like anodizing, chromating, powder coating, or painting, which might be necessary to slow corrosion.

Like the original development K-Alloy SP will withstand extreme salt corrosion and temperatures, vibration, and shock. DTI said the new alloy has been tested to withstand 3,000 hours of salt spray testing, exceeding the performance of other commercially available alloys.

As with the original product, Delphi licensed Beck Aluminum to produce and market K-Alloy SP, in addition to the original patented product. Cleveland-based Beck Aluminum supplies aluminum alloys for more than 700 customer locations in the U.S., Canada, and Mexico. Delphi also established an agreement with a Chinese smelter to produce K-Alloy and K-Alloy SP for that market.

http://www.foundrymag.com/frontpage/feature/85621/corrosionresistant_alloy_now_set_for_sand_and_permant_mold_casting