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KS Kolbenschmidt GmbH

New alloy for compression ignition engines

KS Kolbenschmidt GmbH has adapted the alloy KS 309 used for gasoline pistons for application in diesel pistons. The development focused on improved thermal fatigue strength while at the same time improving high cycle fatigue strength. This high performance alloy is moreover distinctive due to its outstanding casting and flow characteristics as well as the formation of a fine micro structure in the temperature-critical bowl rim area. Given the high demands that modern diesel engines place on pistons, this alloy promises even higher durability strength and thus a longer product life time for the piston. The new alloy is currently undergoing numerous test procedures; at the end of the year it is to be utilized in series developments in automotive and commercial vehicle segments.

The results of comprehensive rig tests have already shown that the diesel piston alloy significantly improved the long-term fatigue strength of the piston: there was an increased high cycle fatigue strength of almost 10% compared to currently available series production alloys at a component temperature of 300°C. It was also possible to increase the thermal fatigue strength by more than 30%. The increases achieved in thermal fatigue strength and high cycle strength considerably enhance the durability of the piston. This is currently being verified in engine tests.

This new high-performance aluminum alloy for diesel applications presents a piston material that can fulfil very strict requirements both now and in the future.