

Another award for Kolbenschmidt

The market for steel passenger car pistons is growing in leaps and bounds

Neckarsulm-based company

KS Kolbenschmidt GmbH teamed up with its customer Daimler and cooperation partner Hirschvogel to develop a new steel piston for diesel car engines. The finished product has now won Germany's 2015 Steel Innovation prize. Dr Alexander Sagel, head of Hardparts at KSPG AG, Rheinmetall's automotive supplier subsidiary, joined representatives from the winning companies in Berlin to accept the award from Germany's Education and Research Minister, Prof. Johanna Wanka.

Already a feature of utility vehicles' and racing cars' engines, steel pistons have now made the transition to diesel engines for passenger cars. KS Kolbenschmidt GmbH's prize-winning piston was the first in the world to go into high-volume production in the V6 diesel engines in Mercedes-Benz's E-Class (E 350 BlueTEC). And that was just the beginning of its amazing success story. Dr Sagel: "We are currently seeing a great deal of interest from our customers in this technology. Around Europe, the concepts that companies are developing today for future generations of high-performance diesel engines feature steel pistons almost exclusively."

Steel pistons for diesel car engines are popular because of their high performance coupled with their remarkable potential for reducing CO₂ emissions. As is commonly known, pistons are among the hardest-working engine parts. New developments to reduce fuel consumption and thereby cut associated CO₂ emissions are based on reducing mechanical friction, optimising combustion processes and focusing on lightweight design.

In an engine, up to 50% of the mechanical friction is generated by the pistons and bearings. Concepts for downsizing, such as cutting displacement volume or reducing the number of cylinders, will only increase the mechanical and thermal requirements for engine parts.

Thanks to their innovative design and their intrinsic material qualities, steel pistons are virtually predestined for use in very compact engines that have the ability to deliver impressive power levels. Steel's extreme strength enables car makers to create pistons with much thinner walls and shorter heights than their aluminium counterparts. For example, a piston's compression height can be reduced by approx. 30%, a change that has advantages not only in terms of space requirements but also for total weight.

Other advantages that steel has over aluminium are its lower thermal expansion and its low thermal conductivity. These increase the engine's ignition performance and reduce the duration of its combustion process.



The results: improved thermodynamic efficiency cuts fuel consumption and so reduces the emission of pollutants.

And while the steel piston has just won a prize, it is not the first time that it has been a hit with the judges. Last autumn, its outstanding CO₂ efficiency won it the MATERIALICA Design + Technology "Best-of-Award".

New to the KSPG production range



Citroën C4 Picasso

Parts supplied by KSPG

- Water circulating pump
- Mechanical water pump



Porsche Macan

Parts supplied by KSPG

- Vacuum pump
- Crankcase



Mercedes-Benz S500 Plug-in-Hybrid

Parts supplied by KSPG

- Electric switchover valves



Fiat 500X

Parts supplied by KSPG

- Oil pump
- Vacuum pump
- Water pump