



ŠKODA
SIMPLY CLEVER

PRESS RELEASE

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ŠKODA AUTO introduces plasma-coated cylinder blocks

- › New EA211-series 1.0 TSI petrol engines now feature an ultra-thin plasma coating instead of cast-iron cylinder liners
- › Low-friction coating reduces fuel consumption, emissions and weight in the new EVO-generation three-cylinder engines
- › 28.8 million euros invested in plasma coating equipment at the Mladá Boleslav plant

Mladá Boleslav, 16 September 2020 – ŠKODA AUTO has put a new processing line for plasma coating into operation. This technically innovative concept allows conventional cylinder liners to be replaced with a powder coating that measures just 150 µm (0.15 mm). This will now be used when producing the new EVO three-cylinder engines from the EA211 series and will reduce internal friction. As a result, the 1.0 TSI EVO petrol engines will be even more efficient and boast even lower emissions. ŠKODA has invested a total of around 29 million euros in preparing and converting its Mladá Boleslav-based headquarters.

Christian Bleiel, Head of Component Production at ŠKODA AUTO, highlighted, “The technically highly innovative plasma coating makes our EA211 TSI EVO engines even more efficient. It reduces friction losses and thus also fuel consumption. What’s more, this type of coating also allows heat to be more evenly distributed within the cylinders and helps it to dissipate more efficiently, thus optimising the thermal load. We produce the plasma-coated engines at Mladá Boleslav in three shifts and are installing them in the FABIA, SCALA, OCTAVIA, KAMIQ and KAROQ.”

This means that the engines featuring plasma coating are also used in the ŠKODA OCTAVIA e-TEC mild hybrids. The Czech car manufacturer has added an assembly line with two special fixtures for plasma coating at its main plant. Both of these include two torches. ŠKODA AUTO has invested a total of 28.8 million euros in upgrading the plant in this way; overall, the carmaker has spent 69.1 million euros on modernising engine production.

During the production process, the cylinders are first bored on the machining line. A 1,500-watt laser then abrades the cylinder bores to ensure that the plasma layer will optimally adhere to the surface. This involves the laser beam creating ten grooves per millimetre, each measuring an average depth of 40 µm. This production step takes place in a controlled atmosphere filled with nitrogen to keep the laser’s optics free from contamination and to ensure the necessary level of accuracy.

A mixture of hydrogen and argon is used to create plasma gas, requiring 4.5 l of hydrogen per minute during the process. The plasma reaches a temperature of 15,000° Celsius and is then mixed with various types of steel that have been ground into fine powder. This powder is made up of iron, carbon, silicon and manganese as well as other necessary elements. The individual powder grains measure no more than 50 µm. When sprayed onto the cylinder walls, the molten powder forms a layer measuring approximately 250 µm. During final processing, this layer is honed out, so that it measures just 150 µm. To put all of this in perspective: the wall of a conventional cylinder liner is 4 mm thick.

Each cylinder is automatically measured at several stages throughout the process to assess its quality. Optical measuring instruments first record the surface abraded by the laser, before a second measurement is taken once the plasma has been applied. Finally, the structure of the plasma layer is tested using turbulent flow.



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Further information:

Tomáš Kotera
Head of Corporate Communications
tomas.kotera@skoda-auto.cz
T +420 326 811 773

Kamila Biddle
Spokesperson – Production, HR and
Environment
kamila.biddle@skoda-auto.cz
T +420 730 862 599

Media images:



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Source: ŠKODA AUTO



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The new equipment in Mladá Boleslav applies a powder mixture of aluminium, steel, carbon, manganese, silicon and other elements to the cylinder walls at 15,000° Celsius. The coating reduces internal friction compared to conventional cylinder liners and increases the efficiency of 1.0 TSI EVO petrol engines.

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Source: ŠKODA AUTO

ŠKODA AUTO

- › is this year celebrating 125 years since the company was founded during the pioneering era of the automobile in 1895, making it one of the longest-established car manufacturers in the world.
- › currently offers its customers nine passenger-car series: the CITIGO, FABIA, RAPID, SCALA, OCTAVIA and SUPERB as well as the KAMIQ, KAROQ and KODIAQ.
- › delivered 1.24 million vehicles to customers around the world in 2019.
- › has been part of Volkswagen Group since 1991. Volkswagen Group is one of the most successful vehicle manufacturers in the world. In association with the Group, ŠKODA AUTO independently develops and manufactures vehicles, as well as components such as engines and transmissions.
- › operates at three locations in the Czech Republic; manufactures in China, Russia, Slovakia and India mainly through Group partnerships, as well as in Ukraine and Kazakhstan with local partners.
- › employs approximately 42,000 people globally and is active in more than 100 markets.
- › is pressing ahead with the transformation from a traditional car manufacturer into the 'Simply Clever company for the best mobility solutions' as part of the ŠKODA 2025 Strategy.