New energy with HiPIMS for the drive technology

Joint research project at Bosch

Optimizing components for combustion engines is part of Robert Bosch GmbH's daily bread. In particular, the company focuses on injectors to further reduce pollutant emissions and fuel consumption. Bosch has launched a research project for the efficient machining of common rail injectors. On board: CemeCon – pioneer and technology leader in HiPIMS coating technology.

With HiPIMS Bosch was able to achieve higher component quality with increased process reliability in the production of common rail injectors.

Whether for passenger cars, commercial vehicles, two-wheelers, off-highway applications or ship and rail transport – Robert Bosch GmbH develops intelligent mobility solutions. At the Bamberg location, the experts set the standards for modern diesel technology in the manufacture of common rail injectors and nozzles as the lead plant in the international manufacturing network, and continue to develop these standards consistently.

Two years ago, a strategic research project began there to investigate the surface properties of cutting tools in order to optimize the machining of common rail injectors. The aim was to analyse the residual stresses of the substrate (carbide) and the influence of a suitable coating on it. In addition to the Institute for Production Technology and Machine Tools of Leibniz University of Hanover, Bosch Bamberg also brought CemeCon AG on board as a project partner, with whom Bosch had already worked successfully on other tool projects. A decisive factor for CemeCon's participation was, among other things, its extensive experience in the application of HiPIMS coating technology.

HiPIMS improves machining

CemeCon has consistently further developed the HiPIMS process to market maturity and high cost-effectiveness. HiPIMS produces smooth, droplet-free and low-stress coatings that are simultaneously hard and tough in an almost unlimited variety. In addition, HiPIMS ensures excellent adhesion and an even coating thickness distribution around the tool cutting edge.

FerroCon® – the HiPIMS coating material developed by CemeCon for the machining of unalloyed, alloyed and high-speed steels – was the focus of the research project and the results confirm its superior properties: With FerroCon®, Bosch was able to achieve considerable tool life and cost savings in the series production of common rail injectors. "The extensive coating knowhow makes CemeCon a competent partner in our research project. The cooperation, also with regard to cost reduction in production, was very successful," says Sebastian Glossner, Project Manager Machining for Common Rail Injectors at Bosch Bamberg.

Robert Bosch GmbH

Robert Bosch founded the Workshop for Precision Mechanics and Electrical Engineering in Stuttgart in 1886. Today, the Bosch Group is a leading international technology and service company with some 403,000 associates worldwide. With its four business sectors Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology, Bosch offers intelligent solutions for many facets of daily life. Its strategic goal is to provide solutions for connected life, with products and services that improve the quality of life of people worldwide.

Injection technology and auxiliary units for internal-combustion engines, as well as a wide range of solutions for drive electrification, steering systems, safety and driver assistance systems, technology for user-friendly infotainment and cross-vehicle communication, workshop concepts, and technology and services for the automotive aftermarket are all part of the Mobility Solutions division. The vision: to make mobility as emission-free, stress-free and accident-free as possible, and to make it multimodal and personalized.

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