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Friction reduction in the automotive industry, present situation and future trends.

André Hieke, Gerrit Jan van der Kolk

Ionbond Netherlands b.v., Venlo, Netherlands

andre.hieke@ionbond.com

The reduction of CO2 emissions is one of the global challenges of our modern industrialized society. The automobile industry is proceeding further to develop engine technology that is even more energy and fuel efficient than today. Initially the fuel efficiency has been increased by raising the fuel injection pressure. PVD coating technologies have facilitated this step. The present trend is a downsizing of the engines, resulting in higher surface loads. Here PVD coatings have stepped in to increase the load carrying capacity and reduce typical abrasive wear linked with the increase of mechanical stresses. The next step now is to improve the thermal efficiency by increasing the combustion temperature. Here we are confronted with limitations of the present generations of coatings. Typical hydrogenated Diamond Like Carbon coatings are limited in maximum operational temperature to ~300 °C. New coatings have been developed and are in development linked with non-hydrogenated DLC mainly. Furthermore there is an increased focus to reduce friction under normal lubrication conditions. Coating systems are being developed to interact with specific lubricants including dopants. A small overview will be given of present examples and an introduction to developments ongoing.

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Friction reduction