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Recent Progress in Tribological Coatings at Continental Automotive GmbH

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Continental Automotive was founded in 1871 in Hannover and is now with over 200000 employees one of the biggest OEM suppliers in the world. Within the Powertrain Division it is producing solutions for engine systems, hybrid electrical vehicles, exhaust management and transmission.

Due to legal obligation to CO₂ reduction, developments such as increasing of fuel injection pressure and downsizing of the engines for improving of combustion efficiency are more in focus of the development, which increases the challenges for automotive components in terms of wear and friction reduction. Recently Continental started its own production and development of coatings in its new Technology Center in Limbach-Oberfrohna (Saxony).

One of the key process challenges is robust and stable process control. At Continental this is achieved by introduction of new quality methods, so called House of Quality. More than 100 equipment parameters have been continuously tracked and its influence on key coating parameters evaluated. Additionally, some of the parameters have been varied in a DoE. By implementation of this method a transfer function for coating properties could be developed and thus production stability and coating homogeneity could be strongly improved.

Another challenge for coating development are long testing cycles for durability runs of up to 6 months. For the acceleration of the testing a fast testing bench has been developed. It is capable of testing with high loads and frequencies, which can accelerate the testing process by a factor of 4000, thus reducing the testing time of new coatings from 3 months to 30 min. By the implementation of these tests our coating development cycles times could be dramatically improved and additionally the statistical significance of the tests was elevated by the increase of the number of parts used for each test.

Keywords

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