

Tips & Technology

For Bosch business partners

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Brake Technology



BOSCH
Invented for life

Bosch brake-pad prototyping

Prototyping at the Bosch laboratory

Knowing the requirements placed on brake pads is a prerequisite for a successful development. Prototyping aims at finding the optimum solution for safety, comfort and economic efficiency. Safe brake pads feature both high shear strength and a high stability of their friction coefficient. Low noise levels, minimum vibration and a safe feeling at the brake pedal make brake pads highly comfortable. At the same time, the wear of both brake pads and brake discs are to be minimized as well in order to ensure economic efficiency. At the prototyping, the backplates are shot blasted, roller coated and selected material mixtures are pressed onto it prior to the curing of the brake pad. This is followed by chamfering, scorching and powder coating of the brake pad. Only if the prototypes have been tested successfully, they go into series production.



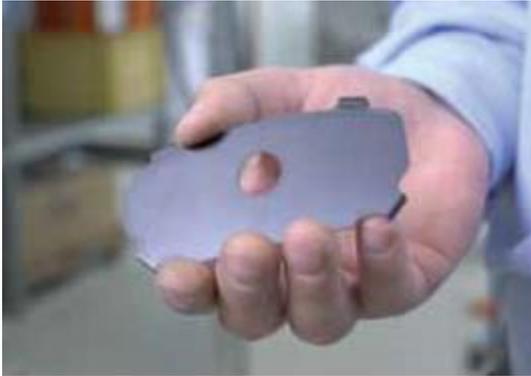
Shot blasting the backplate

The basis: mixture and backplate

A decisive factor for optimum quality is the homogeneity of the individual components of the brake-pad mixture. A reliable and safe connection between brake pad and backplate is yet another one. Therefore, a clean and thoroughly roughened surface is required. To increase the adhesion of the glue onto the backplate, the later one's surface is shot blasted in order to achieve a precisely defined roughness of its surface. Afterwards, the pad mixture is pressed onto the backplate with a pressure of 250 – 400 bars. At 230 °C, the new part is then unified permanently at a curing furnace. In order to ensure an accurate fit on the brake disc installed at the vehicle, an optimum surface is created grinding off excessive material.

Braking performance and comfort

But then, of course, the brake pad is to slide smoothly, safely and with low noise across the brake disc as well. This is achieved by chamfering its edges. Optimum braking performance even under rainy conditions is ensured by a rain slot also minimizing the vibrations on the pad surface. Afterwards, the brake pads are subject to so-called “scorching”, a special high-temperature treatment at 600 °C ensuring safe and reliable braking with new brake pads and without further bedding-in. A powder coating prevents corrosion and noises that might arise as a consequence. In order to reduce the noise levels and for the decoupling of brake caliper and brake pad, even the shims on the pad’s backplate are modified.



Attaching the shims

At the final step of prototyping, clips are attached. Locked into its retainer in this manner, the brake pads brake safely and without any noises.

Performance-Test



At the performance test at the test bench, the friction coefficient and the brake pad’s bedding-in at different pressures are measured thus simulating years of use in vehicles.