

**cardient®
tribo**

**The low
friction
coating for
special
applications.**

Properties

Friction consumes energy. Friction causes wear. Friction can be very expensive. Reducing friction can lead to better efficiency and lower energy costs as well as reduced emissions and waste.

Despite high-tech lubricants and advances in lubrication technology large amounts of energy are wasted due to friction in every transmission system. Using cardient® tribo a large amount of this valuable energy can be saved due to the low friction values. At the same time wear is reduced dramatically due to the extreme hardness.

Hardness (HV)	2500 - 3000
Friction coefficient against steel	< 0.09
Friction coefficient against cardient® tribo	< 0.05
Thickness	0.5 – 2.5 µm
Processing temperature	< 180 °C
Operating temperature	max. 600 °C

Usage

- Hard materials such as metals, ceramics and special plastics.
- Temperature sensitive materials such as hardened steel.

Application areas

- Motor parts (piston rings, valve components, big-end bearings, cam-followers).
- Gearbox parts (gears).
- Bearings.

Example

- A BMW R 1100 S motorcycle had several parts such as tappets, piston bolts, big-end bearings and gearbox parts coated with cardient® tribo and saw a 2.5 % power increase. In addition the coating led to a reduced wear of these parts. As a matter of interest, the engine ran for some time following a crash without any engine oil without any lasting damage.

Coating process

Initially the parts are cleaned using a plasma process. This removes oxides, water, and organic matter using ionic bombardment on the surface which facilitates a good adhesion of the coating. The next step is the application of a thin adhesion layer. The final coating layer is made up of a metal carbide layer with an increased carbon content in the outer layer.

The high hardness is caused by the ion bombardment (forging) during the build-up of the layers. The process parameters are optimised so that low friction is combined with a high wear resistance. The processing temperature is kept below 180 °C and can be as low as 150 °C for especially sensitive materials.

