

The general purpose low friction coating for increased wear resistance.



Properties

cardient® resist is a corrosion resistant, chemically inert metallic layered coating based on carbon. The main characteristic is its extreme hardness plus a very good wear resistance coupled with unusual tribological properties. Another great advantage is that contamination and wear materials do not adhere to the surface.

Hardness (HV)	3200 - 4000
Friction against steel	0.15
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

- Cutting tools.
- Easily smeared tooling (milling tools for aluminium, copper, polymers and optical surfaces).
- Applications demonstrating high cutting friction (valves, cam shafts, bearings).



Examples

- Cutting tools used for the machining of non-ferrous metals or plastics get a build-up of material on the cutting edges which then leads to an early failure of the tool. With a coating of cardient® resist this is often eliminated and leads to a considerable increase in the life of the tooling.
- More than 50 % of IOLs (intra ocular lenses) are machined from acrylic or PMMA blanks. In order to achieve the best surface to reduce glare in the lens very high quality milling tools are used. Normally, these have to be replaced after approximately 50 lenses. Using cardient® resist the life of the tooling can be extended by a factor of 5 to 8.
- In the medical and food industry, bearings are used which are not lubricated due to the potential of contamination from lubricants. As a result only dry bearings can be used. Using cardient® resist, friction is reduced, ensuring among other benefits a longer life.

Coating process

The coating deposition is made in a low pressure plasma. Usually the processing temperature will not exceed 180 °C and can often be kept below 150 °C for temperature sensitive materials.

The first process step is to use a plasma to remove and clean the surface from contaminants such as oxides, water and residual organic matter to ensure maximal adhesion. A special bonding layer is then added to ensure good adhesion between the substrate and the functional layer. The functional layer is a metal carbide layer which contains a higher percentage of carbon in the upper layer.

A continuing bombardment of ions during the coating process raises the hardness of the final layer. The final surface properties can be varied by controlling the ionic bombardment. In the surface the carbon content is raised which ensures tribological properties similar to pure DLC (diamond like carbon).

