

## Frictioncoefficient

	Non lubricated	Lubricated
Steel vs steel	galling	0,20
NiPtef vs steel	0,15	-
NiPtef vs Kanigen®	0,10	-
NiPtef vs NiPtef	0,05	-

## Hardness

The hardness of a NiPtef deposit is:

- Without heat treatment : 350 HV0,1\*
- After 11 hours at 280°C : 550 HV0,1\*

\*mixed hardness (Vickers and shore) measured in HV0,1 on a test plate with 50 µm deposited NiPtef.

## Anti-adhesive coating

The energy for physically separating those Nickel-PTFE layers with 20V% PTFE, is about 18.6 mN/m, meaning that surfaces coated with NiPtef have very low adhesion characteristics towards other materials.

## Other properties of electroless nickel deposits with PTFE

Polymers (like PTFE) have an elasticity modulus which is at least 2 orders of magnitude greater than that of metals, meaning that deformation under stress is mostly an elastic deformation.

PTFE is non-reactive material with a melting point of 325°C. PTFE has a very low friction-coefficient with values determined around 0,05. The low friction-coefficient of PTFE is explained by the structure of the polymer molecule, which enables polymer chains to glide over each other when subjected to a certain shear stress. This behaviour spreads the PTFE easily over the gliding surfaces, on which it will form a very thin lubricating film.

The Tabertest, which has been designed to determine the resistance of surfaces against wear by friction, has shown that the incorporation of 1% PTFE in the electroless nickel plating reduces the weight-reduction by half, compared to non-lubricated electroless nickel plating.

By the test of the crossed cylinders, the wear due to adhesion and the friction coefficient is determined. The results of these tests have shown that the composite coatings containing 20-30% of PTFE, show wear which is 3 orders of magnitude lower than an electroless nickel plating. The friction coefficient is maintained on a low level due to transition of PTFE on the opposing surface.

## Applications

- Dry lubrication
- Reduction of friction
- Reducing adhesive characteristics
- Improving wear- and durability
- Rejection of water and dirt

[www.kanigen.eu](http://www.kanigen.eu)

