



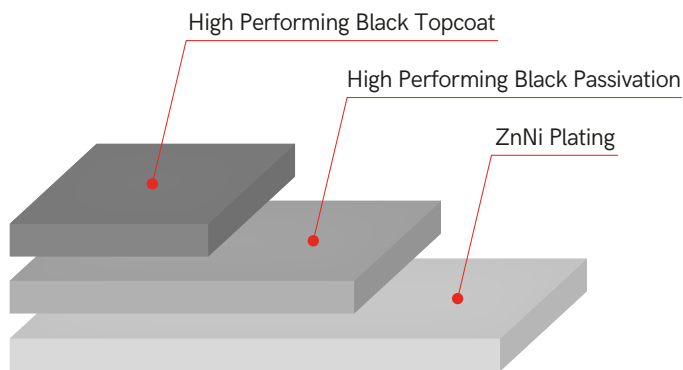
HIBLACK™

The high performing black zinc nickel coating:
ideal for wheel bolts and nuts

HI-BLACK™ is a special ZnNi coating system.

It can be defined as a Duplex coating due to its layer composition: alkaline ZnNi, high performing black passivation and high performing black topcoat. With its uniform matte black appearance, this coating has been specifically developed for applications with high demands both in mechanical and corrosion terms.

Layer



Performance

- Aesthetics: uniform matte black finish
- High stability during multiple subsequent tightenings (20+times)
- Prevents stick slip;
- Good untightening performance at high temperature.
- Cr(VI) and heavy metal free

Process

Suitable for barrel application processes.

Example of application

- High corrosion performance black bolts and nuts
- Bolts/nuts subjected to the action of acid/alkaline fluids
- Bolts/nuts that need to be tightened multiple times with stable performance
- Aesthetic black bolts

Coefficient of friction

- $\mu_{tot} = 0.09 \div 0.15$ according to ISO16047
- High friction stability against the main automotive tightening surface like steel, aluminium and KTL.

Mechanical resistance

Great strength in adhesion & cohesion of the coating suitable for multitightening even in harsh conditions, i.e. with a pneumatic wrench

High corrosion resistance

- Corrosion test: neutral sal spray test acc. to ISO9227
- $WR \geq 480h$; $RR \geq 1000h$
- Excellent performance in Corrosion Test also using acid or alkaline products (both before and after 10 tightenings of the screw).

ISO 9227*

As is Condition		After thermal conditioning (96h, 180°C)		After acid attack (with and without tightening)**		After alkaline attack (with and without tightening)***	
WR	RR	WR	RR	WR	RR	WR	RR
$\geq 480h$	$\geq 1000h$	$\geq 480h$	$\geq 1000h$	$\geq 2h$	$\geq 2h$	$\geq 2h$	$\geq 2h$

* Industrial test results ** Acid solution = 6% HCl ***Alkaline solution = 10 g/l NaOH + 20 g/l Na₂CO₃