



Savroc - Advanced Coating Solutions

TripleHard® - Engine Part Protection

Savroc develops advanced coatings with superior wear resistance, corrosion protection, and sustainability. Our patented TripleHard® coating replaces Cr(VI) hard chrome in a Cr(III) hard-chrome process, meeting industry standards.

High hardness | Low friction | Cr(III)-based | Heat resistant | Corrosion resistant

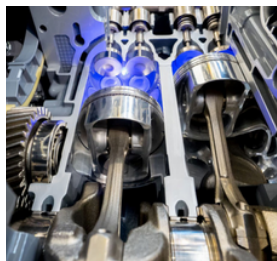
Why Choose TripleHard®

Future-proof chemistry: a Cr(III) hard-chrome process in place of Cr(VI) chemistry.

Outstanding performance: 900–1050 HV hardness without heat treatment, no measurable attack in hot acid, and hardness that rises after heat cycling to 500 °C.

Lower total cost: Converts existing Cr(VI) lines: the Cr(VI) bath is replaced and a nickel stage added where needed. Most of the infrastructure carries over.

Tested technology: TripleHard® has been tested for engine valves. Each customer application is engineered from the customer's drawings and verified during commissioning.



Contact us:

Jussi Räisä
CEO

+358443071409

✉ jussi.raisa@savroc.com

Schedule a meeting with our experts
or download more materials.

 [Savroc.com](https://www.savroc.com)

 [Savroc-ltd](#)



Increased lifespan of components



Reduced maintenance costs



Environmentally friendly alternative

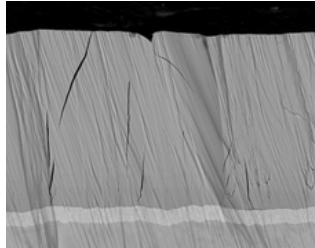
Comparative Coating Technologies Feature

Feature	Cr ⁶⁺ Coating	Nitriding	HVAF	Laser Cladding	TripleHard®
Hardness (HV)	800–1000	1000–1200	1100–1400	900–1300	900–1050
Friction Coefficient	0.2–0.3	0.2–0.3	0.2–0.25	0.2–0.3	0.15–0.2
Cost (€/unit)	Low	Moderate	High	High (energy use)	Low
Environmental Impact	Hazardous (Cr ⁶⁺)	↑ CO ₂ (high temp)	Medium	Very high (energy)	Safe (Cr ³⁺ , no Cr ⁶⁺)
Corrosion Resistance	Good	Moderate	Good	Very high	Excellent
Temperature Resistance (°C)	350–400	500–600	700–800	>800	>500
Impact Resistance	Moderate	Poor	Good	High	High
Coating Thickness (µm)	5–200	100–500	60–300	100–800	5–10 µm on the stem
Suitability for Sliding Parts	Limited	Limited	Good	Poor	Excellent
Process Complexity	Low	Moderate	High	Very high	Moderate

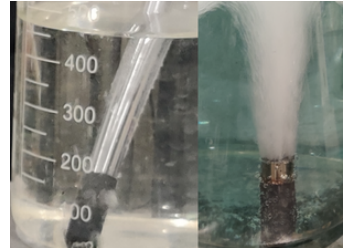
Analytical Evidence



Injector Pins



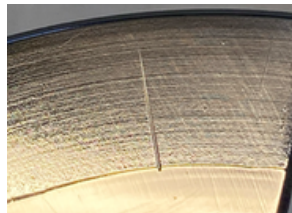
Cross-sectional image of typical TripleHard coating



High Corrosion Resistance

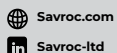


Bend test - No detachment, ensuring strong adhesion



Scratch test - No detachment or cracking, ensuring long-term durability

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