

Resistance Tests

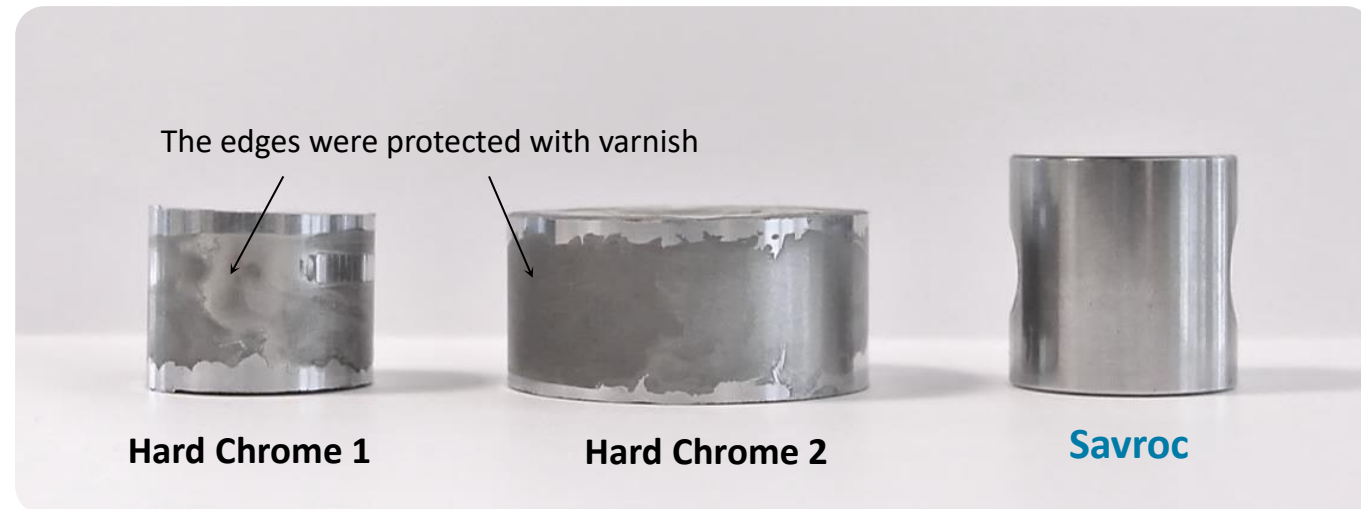
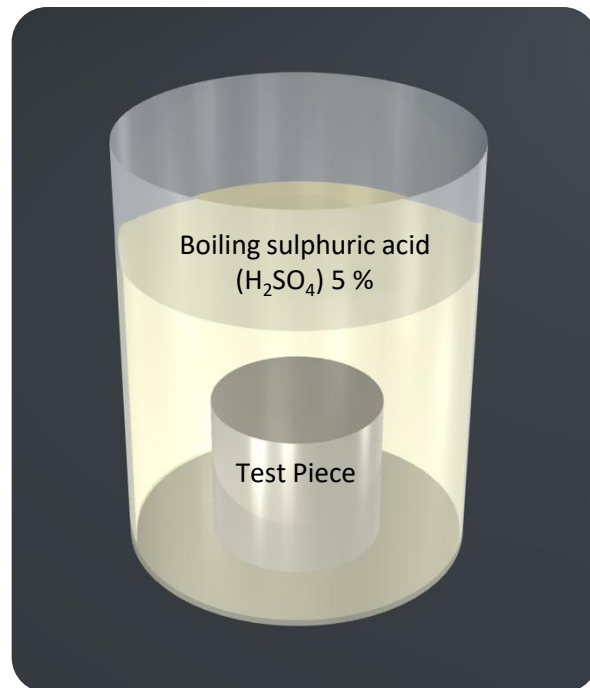
Acid, Corrosion, Wear & Friction

SAURQOC

Case / Acid Resistance (H_2SO_4)

Savroc TripleHard coating's acid resistance was compared with two types of hard chrome coatings. The test pieces were dipped into sulphuric acid (H_2SO_4) 5% in 100 °C temperature.

The results show that Savroc TripleHard resists sulphuric acid significantly better than hard chrome.



Test duration 22 min
Mass loss 0,15 g
Corrosion 22 μ m

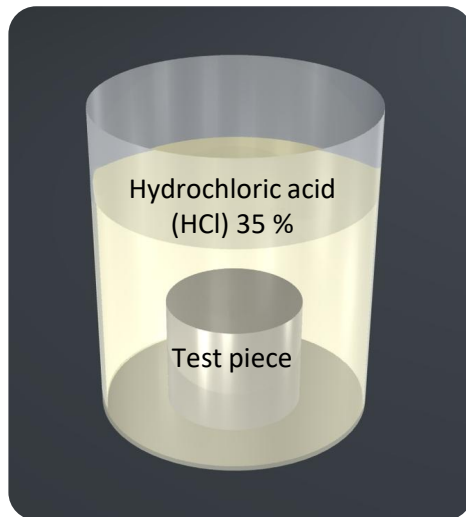
Test duration 2 min
Mass loss 0,18 g
Corrosion 7 μ m

Test duration 23 min
Mass loss 0 g
Corrosion 0 μ m

Case / Acid Resistance (HCl)

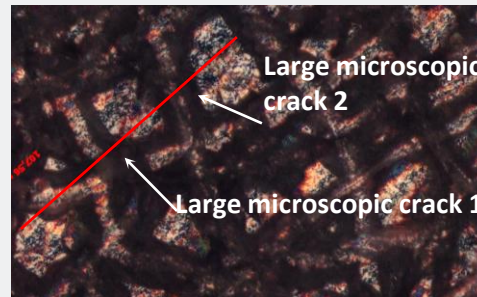
Savroc TripleHard coating's acid resistance was compared with hard a chrome coating. The test pieces were dipped into hydrochloric acid (HCl) 35 % in 20 °C temperature for 1 hour.

The results indicate that Savroc TripleHard resists hydrochloric acid significantly better than hard chrome.



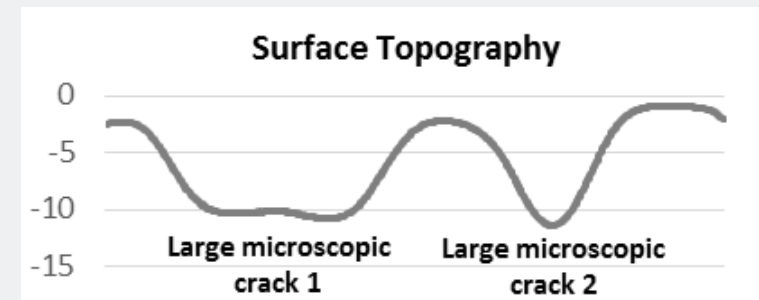
Dipping time:
1 hour

Results after 1 hour acid dip

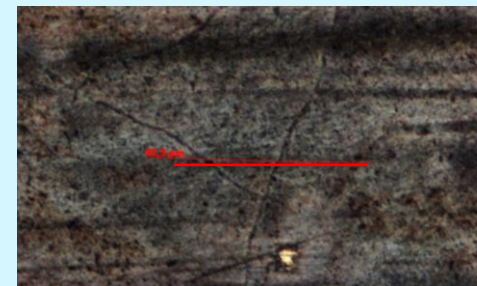


Microscopic image (1000x) of test piece surface

HARD CHROME

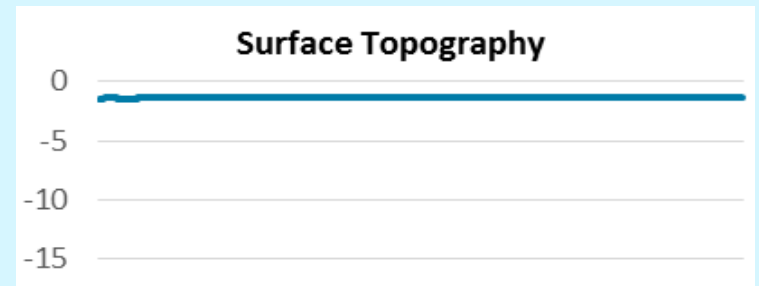


➔ Large microscopic cracks



Microscopic image (1000x) of test piece surface

SAVROC



➔ Normal microscopic cracks

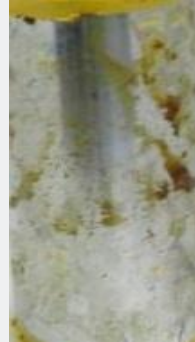
Case / Corrosion Resistance on Steel

AASS, Acetic Acid Salt Spray test according standard ISO 9227

Existing Hard Chromium



48 h
After



48 h
After

Coating thickness 20 µm

Nitriding

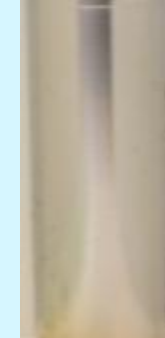


48 h
After

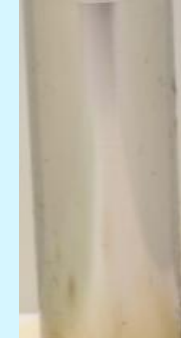
Savroc TripleHard



48 h
After



360 h After



456 h After

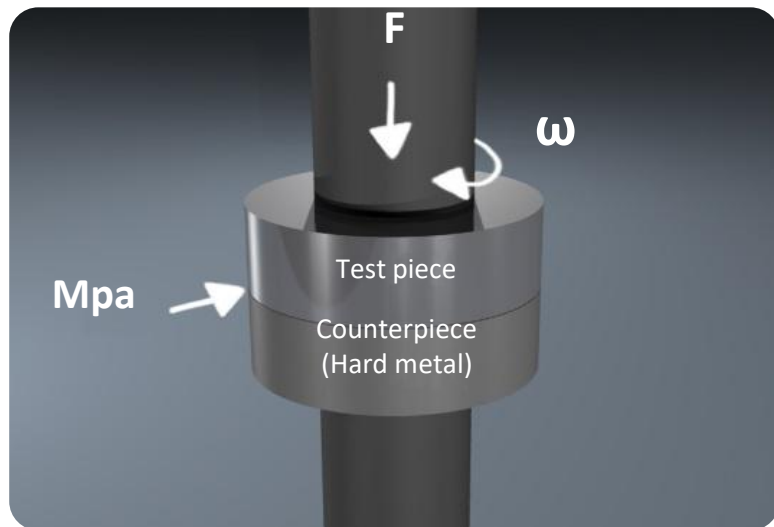
Coating thickness 20 µm

→ Savroc TripleHard coating is significantly more corrosion resistant than existing hard chromium or nitriding based coatings

Case / Wear Resistance

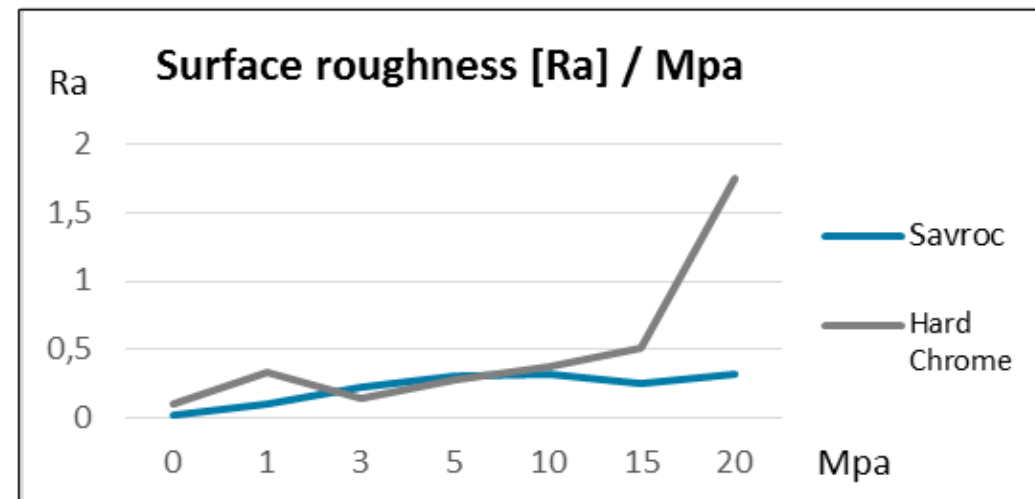
Sliding wear test* was done to compare Savroc's TripleHard coating's (40 μm) sliding wear resistance with a hard chrome coating (80 μm).

Results show that Savroc's coating resists wear better than hard chrome even with a thinner coating surface.



*Sliding wear test with 600 cycles , max. 20 Mpa

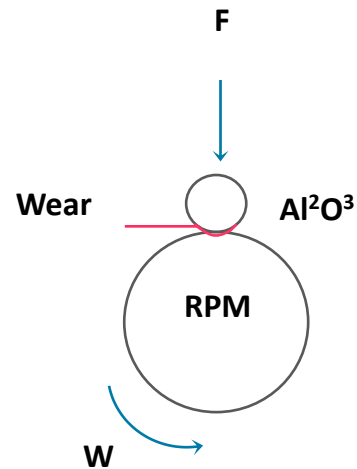
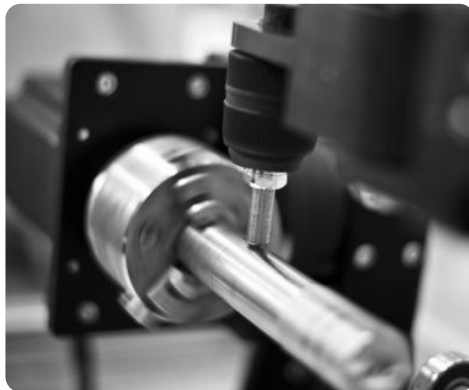
RESULTS



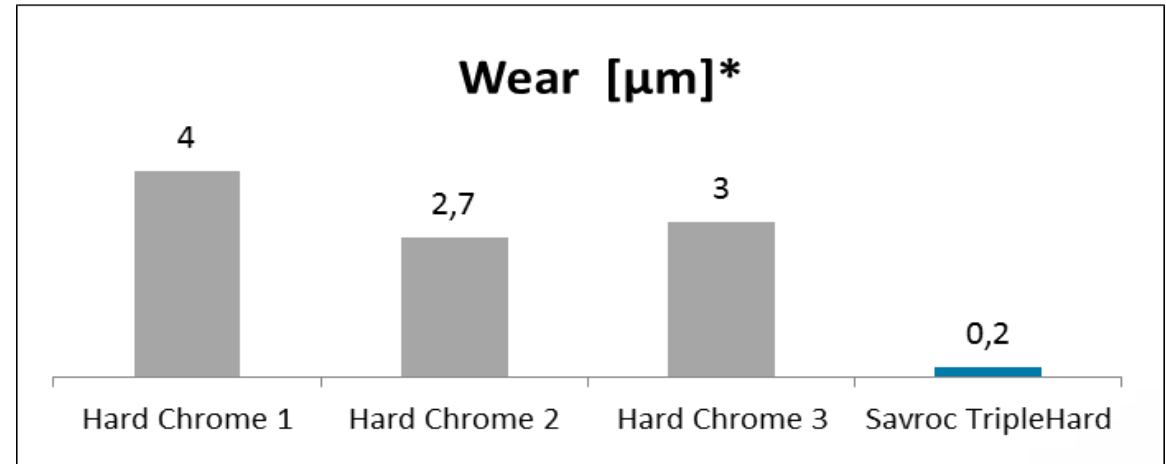
Case / Wear Resistance

A POD (Pin On Disk) type of wear test was done with a shaft to compare Savroc's coatings adhesive wear resistance with three types of hard chrome coatings.

The test indicated that Savroc's coating resists adhesive wear significantly better than hard chrome.



RESULTS

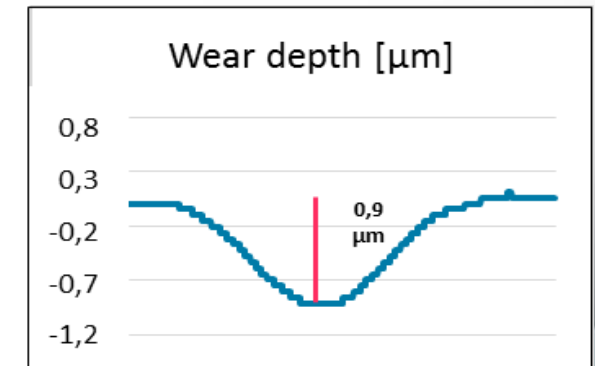


*POD type of test with 6mm Al_2O_3 ball, $m=500g$, $RPM=300$, duration 30 min

Microscopic image

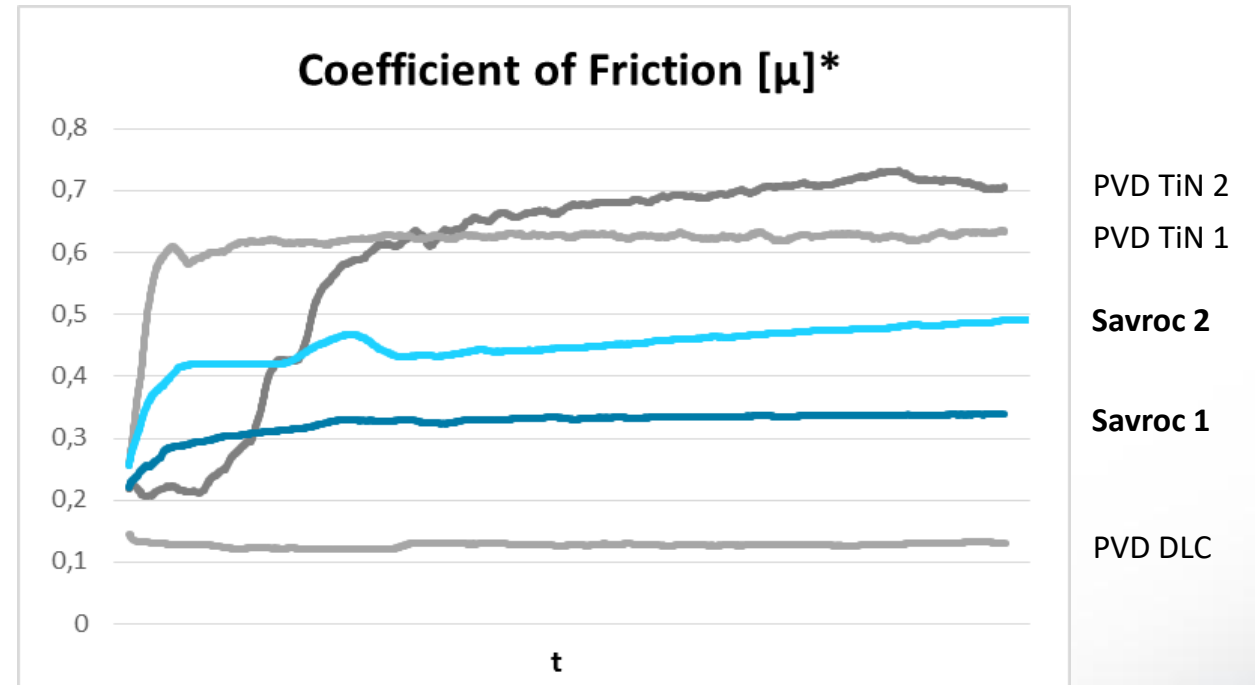
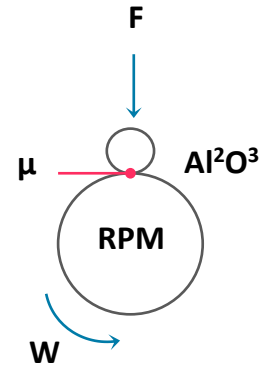


Graph



Case / Friction Properties

A POD (Pin-on-Disc) type of friction test was done with a shaft to compare Savroc's coatings friction properties with different types of PVD coatings.



*POD type of test with 6mm Al_2O_3 ball, $m=500g$, $RPM=300$, duration 30 min

- Both Savroc's coatings friction properties were better than PVD TiN coatings
- Smooth coating enables more efficient function of sliding surfaces for example in engine parts, shock absorbers and cutting tools