

Coating construction and composition (1-layer coating system)

Topcoat	HP-HVOF	Cr ₂ C ₃ - NiCr	>= 100µm (max. 250µm)
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Key coating information

Description	International standard	Minimum value	Griekspoor Standard
Tensile Adhesive Strength	EN 582 or ISO 41916	>= 50 N/mm ²	>= 80 N/mm ²
Corrosion test	DNV-C2	No corrosion visible after 500h	>500h
Corrosion resistance	DIN 50021-ESS ASTM G85	No permeability after 1000h (ECP-test >-350mV) No corrosion (10) after 1000h	Not applicable (Better than galvanic chromium) Not applicable (Better than galvanic chromium)
Porosity		<1%	<0.7%
Chem. Resistance 1. H ₂ SO ₄ (acid) 2. HCL (acid) 3. NaOH (base)			1. Good 2. Fair 3. Excellent
Impact toughness test	DNV-M1 (0.3kpm)	No cracking outside the impact area, min. energy 0,3kpm (3J)	
Rockwell indication test	DNV-M2	No or negligible break-out or cracking	No break-out or cracking
Dynamic bending test 500 x / σ 300 N/mm ²	DNV-M3	No cracks after a minimum of 500 bending cycles	
Micro hardness	HV0,3	950HV (DNV>500)	1150HV
Macro hardness	HR15N	>75	>90
Max. operating temp.	---	-40°C ≤ T ≤ 120 °C	-40°C ≤ T ≤ 870°C
Wear testing	ASTM G065	Approx. 50% better than galvanic chromium	
Surface finish	NEN-EN ISO4287	Ra <0.2µm Rz < 4.0µm Rpk < 0.1µm	Ra < 0.2µm Rz < 2.5µm Rpk < 0.1µm
Seal advice		1. Excellent sealing properties 2. Surface roughness and structure/texture can be adjusted for optimum seal lifetime. 3. Free choice of sealing constructions	
Possibility of integrated Linear Positioning Measuring (LPM-system)		<p align="center">No LPM-system possible Maximum coating specifications: Length 23 meters, Diameter approx. 1 meter, Weight 20 tons.</p>	

General information

TOPCOAT®-CCR is a chromium carbide coating in a nickel/chromium matrix as a binder for the carbides. TOPCOAT® CCR has very good corrosion resistance and oxidation resistance. This coating is specially designed as a better alternative for galvanic chromium. No construction changes are necessary when switching from galvanic chromium to TOPCOAT®-CCR.

Because of the high density (porosity <0.7%) finishing can be very smooth. Average roughness (Ra) can go as low as 0.03µm. Griekspoor can "adjust" the roughness between 0,05 and 0,6µm. This means that the roughness can be set on the optimum roughness for the chosen seals (translation as well as rotation), which gives maximum lifetime for the seals with optimum sealing properties; no leakage, no stick-slip, low friction etc.

This coating is specially designed as a galvanic chrome replacement. It has a longer lifetime than galvanic chromium in equal circumstances.

Typical uses and applications are hydraulic rods, engine valve spindles, liners/bushes, ball valves etc.