GRIEKSPOOR THERMAL COATINGS

Product Specification Sheet TOPCOAT CCR

150µm 1-layer

Chromium-carbide coating

Coating construction and composition (1-layer coating system)

Topcoat	HP-HVOF	Cr_2C_3 - NiCr	≥ 100µm (typically 150µm, max. 250µm)

Key coating information

Description	International standard	Minimum value	Griekspoor Standard
Tensile Adhesive Strength	ISO 14916	≥ 50 N/mm^2	≥ 80 N/mm^2
Corrosion test	NOV/DNV-C2 Endurance test acc. NBD10300	No corrosion visible after 500h No permeability after 1000h (ECP-test > -350mV)	>500h Not applicable (Better than galvanic chromium)
Corrosion resistance	ISO 9227 AASS ASTM G85	No corrosion after 1000h	Not applicable (Better than galvanic chromium)
Porosity		<1%	<0.7%
Chemical Resistance 1. H2SO4 (acid) 2. HCL (acid) 3. NaOH (base)		1. Good 2. Fair 3. Excellent	
Impact toughness test	NOV/DNV-M1 (0.8kpm)	No cracking outside the impact area, min. energy 0.8kpm (8J)	No cracking outside the impact area, min. energy 0.8kpm (8J)
Rockwell indentation test	NOV/DNV-M2	No or negligible break-out or cracking	No break-out or cracking
Dynamic bending test 500 x / σ 300 N/mm^2	NOV/DNV-M3	No cracks after a minimum of 500 bending cycles	No cracks after a minimum of 500 bending cycles
Micro hardness	HV0.3	950HV (NOV/DNV>600)	1150HV
Macro hardness	HR15N	>75	>90
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 <0.25µm Rz < 4.0µm Rpk < 0.1µm	Ra < 0.25µm 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)		**No LPM-system possible** **Length 23 meters, Diameter approx. 1 meter, Weight 20 tons.**	
Elasticity			Fair

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 designed as an improved alternative for galvanic (nickel-)chromium. No construction changes are necessary when switching from galvanic (nickel-) chromium to TOPCOAT CCR.

Because of the high density (porosity <0.7%) finishing can be very smooth. Average roughness (Ra) can be as low as 0.03µm. Griekspoor can "adjust" the roughness between 0.03µm and 0.6µm depending on the optimum roughness required for the chosen seals (translation as well as rotation). This combination leads to maximum seal life time and optimal sealing properties: no leakage, no stick-slip, low friction etc.

This coating is 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.