



**Product Specification Sheet**  
**TOPCOAT□ ULTRA**  
**300µm, 2-layer,**  
**UHCR / Cr<sub>2</sub>O<sub>3</sub> ceramic coating**

**Coating construction and composition (2-layer coating system)**

Bond/intermediate coating	Plasma	Nickel/Chromium	>= 100µm (max. 900µm)
Topcoat□	Plasma	Cr <sub>2</sub> O <sub>3</sub> SiO <sub>2</sub> TiO <sub>2</sub>	>= 200µm (max. 600µm)

**Key coating information**

Description	International standard	Minimum value	Griekspoor Standard
Tensile Adhesive Strength	EN 582 or ISO 41916	>= 35 N/mm <sup>2</sup>	>= 50 N/mm <sup>2</sup>
Corrosion test	DNV-C2	No corrosion visible after 500h	>1000h
	Endurance test acc. NBD10300	No permeability after 1000h (ECP-test >-350mV)	>1000h (ECP-test >-150mV)
Corrosion resistance	DIN 50021-ESS ASTM G85	No corrosion (10) after 1000h	>1000h
Porosity		<4%	<3,0%
Chem. Resistance 1. NaCl (acid) 2. H <sub>2</sub> SO <sub>4</sub> (acid) 3. HCl (acid) 4. NaOH (base)		1. Very good - Excellent 2. Very good - Excellent 3. Very good - Excellent 4. Very good - 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, negligible cracking
Dynamic bending test 500 x / σ 300 N/mm <sup>2</sup>	DNV-M3	No cracks after a minimum of 500 bending cycles	
Micro hardness	HV0,3	850HV (DNV>500)	1000-1100HV
Macro hardness	HR15N	>75	>87
Max. operating temp.	---	-40°C ≤ T ≤ 120 °C	-40°C ≤ T ≤ 540°C
Wear testing	ASTM G065B		
Surface finish	NEN-EN ISO4287	Ra <0,5µm Rz < 5,0µm Rpk < 0,2µm	Ra < 0,35µm Rz < 4,0µm Rpk < 0,1µm
Seal advice		1. Good sealing properties 2. Advised choice of <u>sealing construction</u>	
Possibility of integrated Linear Positioning Measuring (LPM-system)		Yes, over full capacity <b>Length 23 meters, Diameter approx. 1 meter, Weight 20 tons.</b>	
Elasticity			Good

**General information**

The bond is a high corrosion resistant nickel/chromium blend. This coating creates a very good bonding with the ceramic TOPCOAT□ and improves and secures the corrosion resistance of TOPCOAT□.

TOPCOAT□ ULTRA+ is our most wear resistant and dense ceramic coating with very good to excellent corrosion resistance and chemical resistance. TOPCOAT□ UTLRA can be ground to excellent finishes .

Finishing can be very smooth (Ra <0,15µm) however Griekspoor advises to choose a Ra-roughness of approx. 0,2-0,3µm. Griekspoor's seal advice is to use a Stepseal seal construction. This seal construction, together with the advised roughness, will guarantee maximum lifetime with optimum sealing properties; no leakage, no stick-slip, low friction etc.

This coating is especially designed to withstand severe chemical and corrosive environments. In extremely severe environments is better to choose an intermediate coating of approx. 200µm or to choose our "+"-version.

Typical uses and applications are; hydraulic rods/parts, plungers, automotive parts, components for the (petro) chemical industry (test is needed for your specific environment/situation), electrical insulation and dielectric applications, pump seals wear rings, casing rings, down hole plungers in petrochemical industry.