

## Product Specification Sheet

### TOPCOAT® +

**300µm 2-layer Ni based superalloy / Al<sub>2</sub>O<sub>3</sub> + Ti<sub>2</sub>O<sub>3</sub>**

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

|                      |         |   |                       |
|----------------------|---------|---|-----------------------|
| Intermediate coating | HP-HVOF | TOPCOAT® 177 (Ni-superalloy)                    | ≥ 100µm (max. 3000µm) |
| Topcoat              | Plasma  | Al <sub>2</sub> O <sub>3</sub> TiO <sub>2</sub> | ≥ 200µm (max. 600µm)  |

### Key coating information

| Description  | International standard       | Minimum value  | Griekspoor Standard  |
|--|------------------------------|--|--|
| Tensile Adhesive Strength                            | ISO 14916                    | ≥ 40 N/mm <sup>2</sup>                                       | ≥ 50 N/mm <sup>2</sup>                                       |
| Corrosion test                                       | NOV/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                                 | ISO 9227 AASS<br>ASTM G85    | No corrosion after 1000h                                     | >2000h   |
| Porosity   |                              | <4%  | <3%  |
| Chem. Resistance                                     |                              |  |  |
| 1. NaCl (acid)                                       |                              | 1. Very good   |  |
| 2. H <sub>2</sub> SO <sub>4</sub> (acid)             |                              | 2. Very good   |  |
| 3. HCl (acid)  |                              | 3. Very good   |  |
| 4. NaOH (base)                                       |                              | 4. Fair/good   |  |
| 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 or negligible break-out or cracking                       |
| Dynamic bending test 500 x / σ 300 N/mm <sup>2</sup> | NOV/DNV-M3                   | No cracks after bending of minimum of 500 cycles             | No cracks after bending of minimum of 500 cycles             |
| Micro hardness                                       | HV0.3                        | 950HV (NOV/DNV>600)  | 900-1000HV   |
| Macro hardness                                       | HR15N                        | >75  | >85  |
| Operating temp.                                      | ---                          | -40°C ≤ T ≤ 120°C  | 40°C ≤ T <540°C  |
| Wear testing   | ASTM G065B                   |  |  |
| Surface finish                                       | NEN-EN<br>ISO4287            | Ra <0.5µm<br>Rz < 5.0µm<br>Rpk < 0.2µm                       | Ra < 0.35µm<br>Rz < 4.0µm<br>Rpk < 0.1µm                     |

|   |  |   |
|---|--|---|
| Seal advice   |  | <ol style="list-style-type: none"> <li>1. Good sealing properties (sealing advice on Griekspoor.com)</li> <li>2. Advised choice of sealing constructions</li> </ol> |
| Possibility of integrated Linear Positioning Measuring (LPM-system) |  | Yes, over full capacity<br><b>Length 23 meters, Diameter approx. 1 meter, Weight 20 tons.</b>   |
| Elasticity  |  | Good  |

### General information

The bond/intermediate coating is a Griekspoor developed nickel based superalloy, designed to withstand the most severe environments in (chemical) corrosion.

TOPCOAT®+ is a very economic, wear resistant, and dense coating with very good corrosion and chemical resistance. TOPCOAT®+ can be ground to excellent finishes.

Finishing can be very smooth (Ra <0.15µm) however Griekspoor advises to use an Ra-roughness of 0.2-0.4µm. The advice is to use a "Stepseal" seal construction (see Griekspoor.com in TOPCOAT® section). This seal construction, together with the advised roughness, will guarantee maximum lifetime with optimal sealing properties (no leakage, no stick-slip, low friction, etc.).

This coating is designed to withstand maritime environments where very good wear resistance is required. In very severe environments it is advised to choose an intermediate coating of approx. 200µm to increase corrosion resistance.

Typical uses and applications are hydraulic rods/parts, plungers, automotive parts, components for the chemical industry (testing may be needed for the specific environment/situation), electrical insulation, and dielectric applications.