# Nap-Gard®

# 7-2504 Gold-Dual Powder System

Revised: 7 October 2022

## DESCRIPTION

Nap-Gard® Product No. 7-2504 is a thermosetting epoxy powder designed for use as a moisture barrier coating for underground and sub-sea pipelines that operate in high temperature service. This Dual Powder System consists of a thermoset topcoat, Nap-Gard® 7-2504, designed to be applied directly to one of the Nap-Gard® corrosion protection Fusion Bonded Epoxy Systems, 7-2500, 7-2501, 7-2508 Series, 7-2514EN Series and 7-2525 Series.
This dual layer system is capable of withstanding continuous operating temperatures of 130°C (265°F). This product has been certified to meet the requirements of CSA Z245.20-22.

## TYPICAL POWDER PROPERTIES

| | | | |
|---|---|---|---|
| **Color:** | Golden Yellow | **Theoretical Coverage:** | 139 $Ft^2$/lb/mil |
| **Specific Gravity:** | 1.38 ± .05 | **Shelf Life @ 25°C (77°F):** | ***9 months** |
| **Density:**<br>CSA Z245.20-22<br>Clause 12.6 | 1380 ± 50 g/L | **Typical Gel Time:**<br>CSA Z245.20-22<br>Clause 12.2 @ 205°C (400°F) | 15 ± 3 Sec. |

* Transportation: The material is stable during transportation at temperatures below 25°C (77°F) and 50% RH.

## TYPICAL PROPERTIES OF APPLIED FILM†

**Recommended Film Thickness**

| | | |
|---|---|---|
| **Base Coat**:<br>7-2500,7-2501,7-2508 series, 7-2514EN series and 7-2525 series | **For service temperature up to 110°C**<br>200µm (8 mils) Average<br>[This can vary from 6 mils to 12 mils] | **For service temperature above 110°C to 130°C**<br>300µm (12 mils) Average<br>[This can vary from 10 mils to 16 mils] |
| **Top Coat**:<br>7-2504 | 400µm (16 mils) Average<br>[This can vary from 14 mils to 18 mils] | 550µm (22 mils) Average<br>[This can vary from 20 mils to 24 mils] |
| **Minimal Total System Thickness** | 600µm (24 mils) | 800µm (32 mils) |

| TEST / REQUIREMENT | METHOD | CRITERIA | RESULT |
|---|---|---|---|
| **Heat Distortion Resistance** | CSA Z245.20-22<br>Clause 12.7 | Tg3 = 94°C to 104°C<br>(201°F to 219°F) | 101°C |
| **Hardness** | ASTM D2240 | Shore D | 90 Average |
| **Impact Resistance** | ASTM G14 | 3/16" X 1" X 8" Steel Panels | 120 in.lbs |
| **Tensile Strength** | ASTM D2370 | 11,600 psi avg. | |
| **Bending** | CSA Z245.20-22<br>Clause 12.11 | 2.0°/pipe dia.<br>@-30°C (-22°F) | Pass |

Note: Flexibility will be lower at higher film thickness.

| | | | |
|---|---|---|---|
| **Shear Adhesion** | ASTM D1002 | > 6200 psi | |
| **Compressive Strength** | ASTM D695 | 9040 psi (+/- 20%) | |
| **Thermal Conductivity** | ASTM C177 | 0.15 ± 0.02 BTU/hr./ft$^2$/ft./°F | |
| **Cathodic Disbondment** | Modified ASTM G-42<br>1.5 volts, 3% NaCl solution | 14 days @ 113°C (235°F)<br>30 days @ 113°C (235°F)<br>30 days @ 130°C (265°F) | 3.5 mm radius<br>6.6 mm radius<br>10.0 mm radius |
| | Modified ASTM G-95<br>3.0 volts, 3% NaCl solution | 24Hrs. @ 65°C (150°F)<br>7 days @ 85°C (185°F) | 0.5-1.0 mm radius<br>4.0 mm radius |
| | CSA Z245.20-22<br>Clause 12.8:<br>3.0 volts, 3%NaCl solution | 28 days @ 20°C | 2.5 mm radius |

| **CHEMICAL RESISTANCE TESTS** | **MEDIUM** | **TEST DURATION** | **RESULTS** |
|---|---|---|---|
| | Synthetic Seawater @ 25°C | 6 Months | No Effect |
| | Distilled Water @ 80°C | 30 Days | No Cracking,<br>No Disbondment,<br>No Blisters |
| | 5% NaCl @ 80ºC | 90 Days | No Cracking,<br>No Disbondment,<br>No Blisters |
| | 5% Sodium Hydroxide | 30 Days | No Cracking,<br>No Disbondment,<br>No Blisters |

Per CSA Z245-20-98, following solutions tested and passed at 23°C (75°F) for 90 days. Hydrochloric acid (pH 2.5-3.0), 10% Sodium Chloride and Sulfuric Acid (pH 2.5-3.0), 10% Sodium Chloride, Distilled Water, 5% Sodium Hydroxide, Saturated Solution mixture of Magnesium Carbonate and Calcium Carbonate in distilled water.

† Performance depends on film thickness. Consult Nap-Gard® Specialist for specific recommendations.

## TYPICAL ELECTRICAL PROPERTIES OF FILM

| | | | |
|---|---|---|---|
| **Dielectric Strength**<br>ASTM D149-97 | 1050 volts/mil @ 250µm (10 mils) | **Volume Resistivity**<br>ASTM D257 | 3.1 x $10^{15}$ ohm-cm |
| **Dielectric Constant**<br>ASTM D150 | 3.32 @ 1 MHz | | |

## GENERAL APPLICATION PARAMETERS

- Base coat must be at or above 218°C (425ºF) to apply 7-2504. The use of a separate reclaim system is recommended.
- Apply Nap-Gard® base coat followed by Nap-Gard® 7-2504 using electrostatic spray or flocking application.
- Water quench after allowing sufficient time for proper cure. For line pipe, apply 7-2504 in-line before base coat has gelled.
- Follow recommended cure schedule (see below)
- Cure should be verified by DSC or other methods.
- Electrically inspect for holidays. Repair with Nap-Gard® 7-1854
- If girth welds are being coated, refer to Axalta's "Nap-Gard® Field Girth Weld Application Procedure".

**Always consult product Material Safety Data Sheet (SDS) prior to handling.**

## CURE† SCHEDULE GUIDELINES

The minimum post application curing temperature (as measured on the pipe) shall conform to the cure schedule of the base coat. (Refer to Nap-Gard® 7-2500, 7-2501, 7-2508 series, 7-2514EN series technical data sheets). However, a minimum 90 seconds at 218°C (425°F) or higher is needed for proper cure.

**CAUTION** Recommended quench time is based on the assumption that the listed temperature is maintained without any cool down rate. Quench time will vary with application parameters and pipe sizes. Therefore, the above information shall be used only as a guideline by the applicator to develop proper quench time. Cure should be verified by DSC or other methods

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