



PRODUCT NUMBER: 7-2500
APPLICATION: Pipe Coating

Introduction:

Nap-Gard[®] Product No. 7-2500 is a thermosetting epoxy powder designed as a coating for underground and subsea pipeline service. In buried service, the coating is capable of withstanding continuous operating temperatures of 107°C (225°F). This product has been certified to meet the requirements of CSA Z245.20-06, NACE RP-0394 and NSF 61 for Potable Water Services. This product is also recommended for valves and fittings at an average film thickness of 8 mils per the NSF requirement and for use as a primer on multi-layer systems at recommended 8 – 12 mils.

POWDER PROPERTIES

Color:	Reddish Brown	Theoretical Coverage:	134 Ft ² /lb/mil
Specific Gravity:	1.44 ± .05	Typical Gel Time: @ 205°C (401°F) CSA	22 ± 4 Sec.
Density: CSA Z245.20-06 (Section 12.6.2.3)	1440 ± 50 g/L	Shelf Life @ 25°C (77°F): @50% RH	12 months
Thermal Characteristics: CSA Z245.20-06	T _{g1} = 58 ± 5°C T _{g2} = 106 ± 6°C ΔH = 68 ± 10 (J/g)		

TYPICAL PROPERTIES OF APPLIED FILM

Recommended Film Thickness:	350µm (14 mils) Average 300µm (12 mils) Minimum	DSC – glass transition temperature T_{g3} = 110°C (230°F) CSA Z245.20-06
Impact Resistance: ASTM G14-72 1/8" X 5" X 8" Steel Panels CSA Z245.20-06	@ 25°C (77°F) 160 in.lbs. @-30°C (-22°F) > 1.5 J Pass	Hardness: Barcol, ASTM D2583 61 avg. Shore D, ASTM D2240-74 90 avg.
Elongation: Modified ASTM D2370-98	@23°C (73°F) 10.96%	Compressive Strength: ASTM D695-95 10230 psi (+/- 20%)
Bending: CSA-Z245.20-06 API-RP-5L7	@-30°C (-22°F) 3.0°/pipe dia. Passes all requirements	Pass
Tensile Strength: ASTM D2370-98/D882-91	9436 psi	

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

Revised 07/16/2007

DuPont Powder Coatings, U.S.A.
9800 Genard Rd.
Houston, TX 77041
Tel.: 713-939-4000
Fax: 713-939-4027
www.dupontpowder.com

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Shear Adhesion ASTM D1002-94:

Average	6555 psi
Minimum	5934 psi
Maximum	7865 psi

Hot Water Resistance CSA Z245.20-06:

75°C, 24 hr. 1 - 2

Rating

Pass

Thermal Conductivity:ASTM C177 0.19 ± 0.02 BTU/hr./ft²/ft./°F**Cathodic Disbondment:**

CSA Z245.20-06

24 hr., 3.5 volts, 65°C (150°F)	2 - 4 mm radius	Pass
28 days, 1.5 volts, 25°C (77°F)	3 - 5 mm radius	Pass
Strained C.D.	No Cracking	Pass

TYPICAL ELECTRICAL PROPERTIES

Dielectric Strength: ASTM D149-97	1500 volts/mil @ 250µm (10 mils)	Breakdown voltage: ASTM D149-97	20000 volts @ 450 µm (18 mils)
Dielectric Constant: ASTM D150	2.15 at 1 MHz	Volume Resistivity: ASTM D257	3.3 X 10 ¹⁵ ohm-cm.

CHEMICAL RESISTANCE TESTS *

90-Day Immersion per CSA Z245.20-98

HCl in H₂O**, 10% NaCl, H₂SO₄ in H₂O**, 10% NaCl in H₂O, Distilled Water, 5% NaOH in H₂O**, MgCO₃/CaCO₃ in H₂O** No Blistering

* For additional information refer to Nap-Gard Products Catalog Chemical Resistance Chart.

**Distilled Water

GENERAL APPLICATION PARAMETERS

1. Grit blast to NACE Near-White specifications (Swedish Standard #Sa 2½) and profile between 50µm (2 mils) and 112µm (4.5 mils).
2. Use phosphoric acid/deionized water rinse if water soluble salt contamination is suspected.
3. Preheat pipe to approximately 240°C (464°F).
4. Apply Nap-Gard® 7-2500 powder to meet customer thickness specifications.
5. Follow recommended cure schedule (see below).
6. Electrically inspect for holidays and repair all found with Nap-Gard® 7-1631S, 7-1847, or 7-1861.

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GEL TIME & CURE SCHEDULE GUIDELINES

The cure schedule for **Nap-Gard® Product No. 7-2500** shows the minimum time at temperature required to achieve the typical performance properties of the coating. Because pipe cooling rates vary so widely with pipe wall thickness, no allowance has been made for heat loss from the pipe but this can be easily measured on the coating line and allowance made.

Recommended powder application temperature range is 226°C (438°F) to 253°C (488°F) for single/dual layer FBE and post heating is not a normal requirement. The minimum post application curing temperature (as measured on the coated pipe), and the time to quench may conform to the following cure schedule:

Gel Time (CSA Method)

Temperature	Time (Seconds)	Cure Schedule	Time to Quench**
205°C (401°F) *	20	226°C (438°F)	120 Seconds
220°C (428°F) *	12	232°C (450°F)	80 Seconds
226°C (438°F)	10	239°C (462°F)	60 Seconds
232°C (450°F)	9		

* For three layer primer applications only

****CAUTION**** Recommended time to quench is based on the assumption that the listed temperature is maintained without any cool down rate. Time to quench 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 time to quench. Cure should be verified by DSC or other methods. For multi-layer, the optimum time for adhesive application is between 30-70% cure of the FBE. This has to be developed by the applicator based on the plant layout.***

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