Nap-Gard®

7-2514EN Series Fusion Bonded Epoxy

Revised: October 5, 2022

DESCRIPTION

Nap-Gard® Product No. 7-2514EN Series is a family of thermosetting epoxy powders designed for corrosion protection of pipes for underground and subsea pipelines. In buried service, the coating is capable of withstanding continuous operating temperatures of 107°C (225°F). The 7-2514EN Series has been certified to meet the requirements of CSA Z245.20-22 and NACE SP0394-13. This product is offered in different gel times and colors.

TYPICAL POWDER PROPERTIES

Color:		**Theoretical Coverage:**	
7-2514EN	Reddish Brown	Based on Powder	134 Ft^2/lb/mil
72514ENV	Green	Based on Film	143 Ft^2/lb/mil
Specific Gravity:		**Density:**	
Powder	1.44 ± .05	CSA Z245.20	1440 ± 50 g/L
Cured Film	1.35 ± .05	(Section 12.6.2.3)	
Typical Gel Time:	**@204°C (400°F)**	**@232°C (450°F)**	
7-2514FGEN/(V)	8 ± 2 Sec.	5 ± 2 Sec	
7-2514EN/(V)	16 ± 3 Sec.	10 ± 3 Sec.	
7-2514LGEN/(V)	22 ± 4 Sec.	13 ± 4 Sec.	
Shelf Life*:	12 months		
@ 25°C (77°F)			
@ 50% RH			

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

TYPICAL PROPERTIES OF APPLIED FILM†

TEST / REQUIREMENT	METHOD	CRITERIA	RESULT
Recommended Film Thickness		Average Minimum	350µm (14 mils) 300µm (12 mils)
Impact Resistance	CSA Z245.20	@-30°C (-22°F) > 1.5 J	Pass
Bending	CSA Z245.20	@-30°C (-22°F)3.0°/PD	Pass
Shear Adhesion	ASTM D1002	Average	5025 psi
Compressive Strength	ASTM D695	Average	10760 psi (± 20%)
Water Permeability	ASTM D 1653	Average	0.22 g.mm/m^2
Thermal Conductivity	ASTM C177	Average	0.156 ± 0.02 BTU/(hr·ft^2·ft·°F)
Cathodic Disbondment	CSA Z245.20	24 hours, 3.5 V_{dc}, 65°C 28 days, 1.5 V_{dc}., 23°C 28 days, 1.5 V_{dc}., 65°C	1.2 mm radius 2.3 mm radius 6.3 mm radius
Hot Water Resistance	CSA Z245.20	75°C, 24 hours 75°C, 28 days	Rating 1-2 Rating 1-2

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

TYPICAL ELECTRICAL PROPERTIES OF FILM

Dielectric Strength ASTM D149-97	1210 volts/mil @ 250µm (10 mils)		
Dielectric Constant ASTM D150	3.48 @ 1 MHz	**Volume Resistivity** ASTM D257@50% humidity	5.23 x 10^{15} ohm-cm

GEL TIME & CURE† SCHEDULE GUIDELINES

The cure profile and schedule for Nap-Gard® 7-2514EN Series shown below, outlines the minimum time at temperature required to achieve the typical performance properties of the coating. Recommended powder application temperature range is 204°C (401°F) to 239°C (463°F) and post heating is not a normal requirement on many pipe sizes with 0.25 inch wall thickness or above. The minimum post application curing temperature (as measured on the coated pipe), and the time to quench may conform to the following cure schedule:

7-2514FGEN		7-2514EN		7-2514LGEN	
Application Temperature	**Min Time to Quench‡**	**Application Temperature**	**Min Time to Quench‡**	**Application Temperature**	**Min Time to Quench‡**
204°C (400°F)	80 seconds	204°C (400°F)	100 seconds	204°C (400°F)	200 seconds
218°C (425°F)	70 seconds	218°C (425°F)	90 seconds	218°C (425°F)	150 seconds
232°C (450°F)	60 seconds	232°C (450°F)	80 seconds	232°C (450°F)	130 seconds
239°C (463°F)	50 seconds	239°C (463°F)	60 seconds	239°C (463°F)	110 seconds

† Cure is by residual heat in the pipe, therefore very light wall pipe may require additional post heat to complete cure.

‡ 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 three 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.**

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