

Technical Data Sheet

Electrical Insulation

CONATHANE® EN-9

Two-Component Polyurethane Potting Compound & Encapsulant

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CONATHANE® EN-9

Product Description

CONATHANE® EN-9 is an unfilled, two-component, room temperature curing, 100%-solids polyurethane system.

It consists of CONATHANE® EN-4 Part A Urethane Prepolymer and CONATHANE® EN-9 Curative.

Areas of Application

Highly recommended for cable and connector potting and molding, both military and commercial watertight electrical connectors, harness break-outs and cables.

Other applications include potting and encapsulation of modules, wire wound devices and strain sensitive components as well as 100% solids and solvent-based coatings for printed circuitry and components.

Features and Benefits

- Superior hydrolytic stability
- Good handling properties
- Thermal shock resistant
- Non-MbOCA curing system
- High dielectric strength
- Low dielectric constant
- Low dissipation factor
- Non-nutrient for fungus

Application Methods

- Hand-mix Bench Potting / Casting
- Meter-mix Bench Potting / Casting
- Meter-mix Vacuum Potting / Casting

Transportation / Storage

Store below 25°C / 77°F in a dry controlled environment out of direct sunlight. This material should be suitable for use stored under these conditions in the original sealed containers for twelve (12) months from the date of shipment.

Failure to store the product as recommended above may lead to deterioration in product performance.

This product is sensitive to moisture and atmospheric humidity. Containers, once opened, should be used immediately or blanketed with dry air or nitrogen (CONAP® Dri-Purge) before resealing.

Mix individual components thoroughly before use.

CONATHANE® EN-4 Part A may crystallize upon storage or during shipment. If this has occurred, heat to 60°C, mix thoroughly, and cool to room temperature before processing.

Health / Safety

Refer to the Safety Data Sheet.

Typical Properties of Material as Supplied

Property	Conditions	Value		Units
		CONATHANE® EN-4 Part A Urethane Prepolymer	CONATHANE® EN-9 Part B Curative	
Viscosity	25°C / 77°F	7,500	950	cP
Specific Gravity	25°C / 77°F	0.97	1.00	
Appearance		Translucent Amber	Amber	
Mix Ratio	Parts by weight	100	17.5	
	Parts by volume	100	17	

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Typical Properties of Mixed Materials

Property	Conditions	Value	Units
Viscosity (initial)	25°C / 77°F	6,800	cP
Gel time (100,000 cP)	25°C / 77°F	80	minutes
Gel time (250,000 cP)	25°C / 77°F	120	minutes
Peak exotherm	2 lb. mass at 25°C / 77°F	55 / 130	°C / °F

Application / Curing Schedule

Mix the EN-4 Part A and EN-9 Part B in the ratio specified above until homogeneous. Components may be preheated up to 60°C if reduced viscosity is required. If hand mixing, degas at >27 in. Hg vacuum before use.

Cure 24 hours at 60°C / 140°F – or – 16 hours at 80°C / 176°F – or – 8 hours at 100°C / 212°F

Demold after 10 hours at 60°C / 140°F – or – 8 hours at 80°C / 176°F – or – 4 hours at 100°C / 212°F

The cure schedules above are based on time after the unit reaches the specified temperature and are recommendations only. The user is responsible for determining the optimum cure conditions for his application.

Typical Electrical Properties

Property	Test Method	Conditions	Value	Units
Dielectric Strength	ASTM D149	1/16" @ 25°C / 77°F	750	volts / mil
Dielectric Constant	ASTM D150	100 Hz @ 25°C / 77°F	3.0	
		1 kHz @ 25°C / 77°F	2.9	
		1 MHz @ 25°C / 77°F	2.8	
		100 Hz @ 130°C / 266°F	3.8	
		1 kHz @ 130°C / 266°F	3.8	
		1 MHz @ 130°C / 266°F	3.3	
Dissipation Factor	ASTM D150	100 Hz @ 25°C / 77°F	0.03	
		1 kHz @ 25°C / 77°F	0.03	
		1 MHz @ 25°C / 77°F	0.01	
		100 Hz @ 130°C / 266°F	0.03	
		1 kHz @ 130°C / 266°F	0.03	
		1 MHz @ 130°C / 266°F	0.04	
Volume Resistivity	ASTM D257	25°C / 77°F 130°C / 266°F	> 4.3 x 10 ¹⁵ 7.4 x 10 ¹¹	ohm-cm
Surface Resistivity	ASTM D257	25°C / 77°F 130°C / 266°F	> 1.0 x 10 ¹⁵ 1.6 x 10 ¹²	ohms / sq.

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Typical Electrical Properties (cont.)

Property	Test Method	Conditions	Value	Units
Insulation Resistance	MIL-M-24041C	25°C / 77°F 130°C / 266°F	>2.5 x 10 ¹³ 2.3 x 10 ¹⁰	ohms
Arc Resistance	MIL-M-24041C	25°C / 77°F	120	seconds
Flame Resistance	MIL-M-24041C	55 amps DC	No ignition	

Typical Mechanical Properties

Property	Test Method	Conditions	Value	Units
Appearance	Visual	25°C / 77°F	translucent amber	
Specific Gravity	ASTM D792	25°C / 77°F	1.01	
Shore Hardness	ASTM D2240	25°C / 77°F After 7 d @ 135°C / 275°F	A 90 A 98	
Tensile Strength	ASTM D412	25°C / 77°F 100% modulus 300% modulus	2,000 700 1,300	psi psi psi
Ultimate Elongation	ASTM D412	25°C / 77°F	450	%
Tear Strength	ASTM D624	25°C / 77°F	280	pli
Linear Shrinkage	MIL-M-24041C		1	%
Volumetric Shrinkage	MIL-M-24041C		4	%
Moisture Absorption	MIL-M-24041C	24 h @ 93°C / 200°F	0.5	%
Water Absorption	ASTM D570	24 h @ 25°C / 77°F 30 d @ 25°C / 77°F	0.2 0.4	%
Heat Aging (wt. loss)	MIL-M-24041C	7 d @ 135°C / 275°F	0.5	%
Fungus Resistance	MIL-E-5272C		non-nutrient	
Thermal Shock	MIL-I-16923E	-70°C to 130°C	pass 10	cycles
Compression Set	ASTM D395	Method B	44	%
Peel Strength	aluminum primed with CONAP® AD-1147-C stainless steel primed with CONAP® AD-1146-C neoprene primed with CONAP® PR-11167 PVC Primed with CONAP® AD-1161		>20 >20 >20 >20	piw piw piw piw

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Typical Hydrolytic Stability Properties (97°C / 95% RH)

Property	Conditions	Original	After 112 Days	Units
Shore Hardness		A 90	A 87	
Tensile Strength	300% modulus	2,000 1,700	775 700	psi psi
Ultimate Elongation		450	370	%
Tear Strength	Die C	280	190	pli
Dielectric Strength	25°C / 77°F	750	570	volts / mil
Dielectric Constant	1 kHz - 25°C / 77°F	2.9	3.0	
Dissipation Factor	1 kHz - 25°C / 77°F	0.03	0.03	
Volume Resistivity	25°C / 77°F	4.3 x 10 ¹⁵	2.8 x 10 ¹⁵	ohm-cm

The above properties are typical values and are not intended for specification use.

ELANTAS PDG, Inc. warrants the chemical composition of its products within stated tolerances, but does not guarantee that a product will be appropriate for any particular application. Any recommendation, performance of tests or suggestion is offered merely as a guide and is not a substitute for a thorough evaluation by the user. No representative of ELANTAS PDG, Inc. has the authority to offer a warranty that a product will perform satisfactorily in manufacturing an article and no such representation should be relied upon.

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