

Technical Data Sheet

Electrical Insulation

CONATHANE® EN-21

Two-Component Polyurethane Potting Compound

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CONATHANE® EN-21

Product Description

CONATHANE® EN-21 is a two-component unfilled, low viscosity polyurethane system.

Areas of Application

Formulated specifically for the potting, casting, embedding, and encapsulation of electronic circuits, components and power devices.

Ideal for use in potting transformers, coils, reed and mercury switches, inductors, solid state ignition systems, voltage regulators, ballasts, micro-circuits, rectifiers and printed circuit assemblies.

Features and Benefits

- Excellent electrical properties
- Low viscosity
- Low exotherm and low shrinkage
- Thermal shock resistant
- Room temperature or low temperature cure
- Low stress build-up on embedded components
- Excellent moisture resistance

Application Methods

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

Transportation / Storage

Store at 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.

Health / Safety

Refer to the Safety Data Sheet.

Typical Properties of Material as Supplied

Property	Conditions	Value	
		CONATHANE® EN-21 Part A Urethane Prepolymer	CONATHANE® EN-21 Part B Curative
Viscosity	25°C / 77°F	6,000 cP	800 cP
Specific Gravity	25°C / 77°F	1.14	0.96
Appearance		Clear Amber	Clear Amber
Mix Ratio	Parts by weight	100	116
Flashpoint	ASTM D93	> 94°C > 201°F	> 94°C > 201°F

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Typical Properties of Mixed Materials

Property	Conditions	Value	Units
Viscosity (initial)	25°C / 77°F	2000	cP
Pot Life	25°C / 77°F	40	minutes
	60°C / 140°F	8	minutes
Gel Time	25°C / 77°F	90	minutes
	60°C / 140°F	20	minutes

Regulatory Information

RoHS Compliance	CONATHANE® EN-21 Part A Urethane Prepolymer and CONATHANE® EN-21 Part B Curative comply with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 (RoHS 2.0) as amended 31 March 2015.
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Application / Curing Schedule

Combine EN-21 Part A and EN-21 Part B in the ratio specified. The two components should be mixed thoroughly in metal or glass containers using metal or glass stirrers. Degassing of the mixed system should be accomplished at room temperature at >27 in. Hg vacuum. Containers should be large enough to allow for frothing during the degassing process.

Cure 7 days at 25°C / 77°F – **or** – 4 hours at 80°C / 176°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.

Primers are available if improved adhesion is required. For metals CONAP® AD-1146-C is recommended. For plastics CONAP® PR 1167 is recommended.

Electrical Properties

Property	Test Method	Conditions	Value	Units
Dielectric Strength	ASTM D149	25°C / 77°F – 1/16"	650	volts / mil
Dielectric Constant	ASTM D150	1 kHz - 25°C / 77°F	3.4	
		1 kHz - 105°C / 221°C	6.1	
Dissipation Factor	ASTM D150	1 kHz - 25°C / 77°F	0.02	
		1 kHz - 105°C / 221°C	0.03	
Insulation Resistance	MIL-M-24041C	25°C / 77°F	> 2.5 x 10 ¹³	ohms
		130°C / 266°F	1.4 x 10 ⁹	ohms
Volume Resistivity	ASTM D257	25°C / 77°F	7.2 x 10 ¹⁴	ohm-cm
		130°C / 266°F	1.8 x 10 ¹¹	ohm-cm
Surface Resistivity	ASTM D257	25°C / 77°F	> 1.0 x 10 ¹⁵	ohms
		130°C / 266°F	6.9 x 10 ¹²	ohms

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Typical Physical Properties

Property	Test Method	Conditions	Value	Units
Shore Hardness	ASTM D2240	25°C / 77°F	A 80	
Tensile Strength	ASTM D412	25°C / 77°F	2,000	psi
Ultimate Elongation	ASTM D412	25°C / 77°F	155	%
Tear Strength	ASTM D624	25°C / 77°F	120	pli
Linear Shrinkage		25°C / 77°F	1.4	%
Water Absorption	ASTM D570	24 h @ 25°C / 77°F	0.07	%
		7 d @ 25°C / 77°F	0.15	%
		28 d @ 25°C / 77°F	0.16	%
Compression Set	ASTM D395 Method B	25°C / 77°F	10	%
Specific Gravity		25°C / 77°F	1.07	
Coefficient of Thermal Expansion	ASTM D696	25°C / 77°F	210	ppm / °C
Hydrolytic Stability	MIL-M-24041C		pass	
Thermal Conductivity	ASTM C177	25°C / 77°F	0.3	W / m·K
Thermal Shock	MIL-I-16923E	-65°C to 130°C	pass 10	cycles
UL Flammability Rating	UL 94	25°C / 77°F	94 HB	

Heat Stability – After exposure at 130°C / 266°F

Property	Conditions	Before	After	Units
Weight Loss	500 hours	-	0.34	%
	1000 hours	-	0.48	%
Shore Hardness	500 hours	A 80	A 91	
	1000 hours	A 80	A 96	

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

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