

CONATHANE® EN-21

UL RECOGNIZED

CONATHANE EN-21 is a two-component, liquid, low viscosity, low toxicity, room temperature curing polyurethane resin system. This system was formulated specifically for the potting, casting, embedding, and encapsulation of electronic circuits, components, and power devices.

CONATHANE EN-21 is an easy-to-use, non-TDI, non-MBOCA system. It can be hand mixed or machine dispensed and cured at room or elevated temperatures. CONATHANE EN-21 cures to yield an 80 Shore A elastomer and has the following outstanding characteristics:

- Excellent Electrical Properties
- Low Toxicity
- Low Viscosity
- Low Exotherm and Low Shrinkage
- Easy Handling
- Low Stress Build-up on Embedded Components
- Reversion Resistance
- Excellent Moisture Resistance

CONATHANE EN-21 is 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.

TYPICAL PRODUCT CHARACTERISTICS

	Prepolymer Part A	Curative Part B
Color	Clear Amber	Clear Amber
Viscosity @ 25°C	6,000 cps	800 cps
Specific Gravity @ 25°C	1.14	0.96
NCO Content	16.0	---

TYPICAL CURED PROPERTIES Physical Properties

Hardness, Shore A (±5)	80
Tensile Strength, psi	2,000
Elongation, %	155
Tear Strength, psi	119
Linear Shrinkage, in./in.	0.014
Water Absorption @ 25°C, %	
24 Hours	0.07
1 Week	0.15
4 Weeks	0.16
Compression Set (Method B), %	10
Specific Gravity @ 25°C	1.07
Linear Thermal Expansion, in./in., °C	2.10 x 10 ⁻⁴
Hydrolytic Stability	Passes
Thermal Conductivity (cal/sec/cm ² /°C/cm)	7.1 x 10 ⁻⁴
Thermal Shock	Passed Olyphant Washer Test per MIL-I-16923E (-65°C to +130°C)
Heat Stability @ 130°C	
500 Hours:	
Shore Hardness	91A
% Weight Loss	0.34
1000 Hours:	
Shore Hardness	96A
% Weight Loss	0.48
Flammability (UL 94)	94HB

Electrical Properties

Dielectric Strength, vpm (1/16")	650
Volume Resistivity, ohm-cm @ 25°C	7.2 x 10 ¹⁴
@ 130°C	1.8 x 10 ¹¹
Surface Resistivity, ohms @ 25°C	>1.0 x 10 ¹⁵
@ 130°C	6.9 x 10 ¹²
Dielectric Constant @ 1 KHz	
@ 25°C	3.4
@ 105°C	6.1
Dissipation Factor @ 1 KHz	
@ 25°C	0.017
@ 105°C	0.030
Insulation Resistance, ohms	
@ 25°C	>2.5 x 10 ¹³
@ 130°C	1.4 x 10 ⁹

RECOMMENDED PROCESSING PARAMETERS

Mix Ratio by Weight, Part A/Part B	100 / 116
Mixed Viscosity, cps @ 25°C	2000
@ 60°C	320
Pot Life @ 25°C, 250 gms, minutes	40
@ 60°C, minutes	8
Gel Time @ 25°C, 250 gms, minutes	90
@ 60°C, minutes	20
Peak Exotherm, Mixed @ 25°C, °C	69
Recommended Cure	7 Days @ 25°C or 4 hours @ 80°C

The following procedure is suggested for hand processing:

1. Mix the two components together thoroughly at room temperature in metal, plastic, or glass containers, using a metal spatula. **DO NOT** use paper containers or wooden sticks. Any moisture introduced into the system will cause bubbling and/or foaming during curing.
2. If void-free castings are required for the particular application, degas the mixed system at 1-5 mm of mercury vacuum. Allow froth to rise and collapse; continue vacuum for 2-5 minutes. Containers should generally have twice the volume of mixed material to allow for frothing.
3. Pour into dry preheated units. Best results are generally obtained when the unit is at least 10°C warmer than the mixed material. Pour down the side of the unit to be potted to avoid air entrapment.
4. If the potted device is to be heat cured, it is best to allow the device to sit at room temperature for 1-2 hours to permit air bubbles, entrapped during pouring, to dissipate.
5. When containers are opened and the contents only partially used, be certain to flush them with dry nitrogen or CONAP® Dri-Purge (Request Technical Bulletin AC-105) to prevent moisture contamination and subsequent waste of material.

Mold Release Agents

If the potted device is to be removed from a mold, apply a quality CONAP® mold release to ensure proper release.

Primers

If improved adhesion is required, use one of the following recommended primers:

1. To Metals - Heat Curing - CONAP® AD-1146-C (Bulletin A-143)
2. To Plastics and Rubber - CONAP® PR-1167 (Bulletin A-144)

HANDLING PRECAUTIONS

Although the very low vapor pressure of CONATHANE EN-21 greatly reduces the vapor hazard as compared to TDI-based systems, careless handling of any isocyanate should be avoided. The user is cautioned to avoid contact with the resin and hardener. The use of protective clothing is recommended. Should contact occur, the skin should be washed immediately with mild soap and water. In case of eye contact, flush eyes immediately with water and obtain medical attention.

Use in well-ventilated areas and avoid prolonged or repeated breathing of vapors. Accidental spills in the work area should be wiped up right away. (For additional information, request Bulletin GI-4).

STORAGE

CONATHANE EN-21 Part A and Part B components are storage stable in their original, unopened containers for 18 months from date of manufacture when stored at 65°F-85°F.

AVAILABILITY

CONATHANE EN-21 is available in quart, gallon, 5-gallon, and 55-gallon units. Each unit consists of pre-weighed quantities of Part A and Part B components.

CAUTION

Responsible handling of Cytec Industries Inc. products requires a thorough preview of safety, health, and environmental issues prior to use. Review the Material Safety Data Sheets(s) for the specific Cytec Industries Inc. product(s) and container label information before opening containers. Ensure that employee exposure issues are understood, communicated to all workers, and controls are in place to prevent exposures above Permissible Exposure Limits (P.E.L.'s). Review safety and environmental issues to be certain controls are in place to prevent injury to employees, the community, or the environment, and ensure compliance with all applicable Federal, State, and Local laws and regulations. For assistance in this review process, please call your Cytec Industries Inc. representative or our office noted below.

• Email: custinfo@cytec.com Worldwide Contact Info: www.cytec.com/conap Tel: 716.372.9650 Fax: 716.372-1594 •