Technical Data Sheet

Electronic & Engineering Materials

# CONATHANE® EN-1556

## Two-Component Polyurethane Potting Compound & Encapsulant

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# CONATHANE® EN-1556

## Product Description

CONATHANE® EN-1556 is an unfilled, two-component, room temperature curing, 100%-solids polyurethane system.

It consists of CONATHANE® EN-1556 Part A Urethane Prepolymer and CONATHANE® EN-1556 Curative.

## Areas of Application

Polyether-based system primarily intended for use as a molding, encapsulating and potting compound for harness breakouts, watertight electrical connectors, cables and cable end seals.

Other applications include casting and molding of mechanical parts and lining material for pumps, chutes, and conveyors requiring outstanding abrasion resistance.

## Features and Benefits

- Conforms to MIL-M-24041C
- Excellent hydrolytic stability
- Thermal shock resistant
- Non-MbOCA curing system
- Excellent resistance to oils, gasoline, JP-4 fuel, and seawater
- Non-nutrient for fungus
- Cartridge friendly 3:1 volumetric ratio

## 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-1556 Part A and EN-1556 Part B 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-1556 Part A Urethane Prepolymer** | **CONATHANE® EN-1556 Part B Curative** | |
| Viscosity | 25°C / 77°F | 18,000 | 3,000 | cP |
| Specific Gravity | 25°C / 77°F | 1.05 | 1.03 | |
| Appearance | | Amber | Amber, Black | |
| Mix Ratio | Parts by weight<br>Parts by volume | 100<br>100 | 33<br>33 | |

# CONATHANE® EN-1556

## Typical Properties of Mixed Materials

| Property | Conditions | Value | Units |
|---|---|---|---|
| Viscosity (initial) | 25°C / 77°F | 10,040 | cP |
| Work Life (250,000 cP) | 2 lbs. @ 25°C / 77°F<br>2 lbs. @ 60°C / 140°F | 60 – 70<br>15 – 20 | minutes<br>minutes |

## Regulatory Information

| Property | |
|---|---|
| RoHS Compliance | CONATHANE® EN-1556 Part A Urethane Prepolymer and CONATHANE® EN-1556 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. |

## Application / Curing Schedule

Mix the EN-1556 Part A and EN-1556 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.

EN-1556 potting compound and encapsulant may be applied by ordinary casting techniques or by injection molding techniques. For most injection molding applications, injection pressures of 40 – 120 psi are generally used. If molding compound is injected at elevated temperatures (60°C / 140°F to 82°C / 180°F), lower injection pressures (10 – 30 psi) should be used to prevent air from being entrapped in the compound.

Best results are obtained when the part being molded and the mold itself are approximately 10 - 20°F (5 – 10°C) warmer than the compound being injected. It is recommended that injection holes be located in the bottom of the mold and air bleed holes located in the top of prevent air pockets in the mold.

Cure 10–14 days at 25°C / 77°F **– or –** 16 hours at 82°C / 180°F **– or –** 8-10 hours at 100°C / 212°F

Demold after 24 hours at 25°C / 77°F **– or –** 60 minutes at 80°C / 176°F **– or –** 30 minutes 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.

To approve adhesion, three primers have been developed for use with the EN-1556. CONAP® AD-1146 is recommended for metals, CONAP® PR-1167 for neoprene, and CONAP® AD-1161 for polyvinyl chloride.

Molds may be coated with CONAP® MR-5002 Mold Release to ensure easy removal of cast parts.

# CONATHANE® EN-1556

## Typical Mechanical Properties

| Property | Test Method | Conditions | Value | Units |
|---|---|---|---|---|
| Appearance | Visual | 25°C / 77°F | amber or black | |
| Specific Gravity | ASTM D792 | 25°C / 77°F | 1.05 | |
| Shore Hardness | ASTM D2240 | 25°C / 77°F<br>After 24 h @ 135°C / 275°F | A 80<br>A 74 | |
| Compression Set | ASTM D395 | Method B | 35 | % |
| Tensile Strength | ASTM D412 | 25°C / 77°F<br>300% modulus | 5,000<br>1,400 | psi<br>psi |
| Ultimate Elongation | ASTM D412 | 25°C / 77°F | 400 | % |
| Tear Strength | ASTM D624 | 25°C / 77°F | 200 | pli |
| Volumetric Shrinkage | MIL-M-24041C | | 3.6 | % |
| Moisture Absorption | MIL-M-24041C | 24 h @ 93°C / 200°F | 2.1 | % |
| Fungus Resistance | MIL-E-5272C | | non-nutrient | |
| Low Temperature Flexibility | MIL-M-24041C | -54°C / -65°F | No blistering, cracking or loss of adhesion cycles | |
| Property degradation | Tensile strength after 2 weeks immersion in water @ 70°C / 158°F | | 28.6 | % loss |
| Peel Strength | Type 316 CRES primed with CONAP® AD-1146<br>Monel primed with CONAP® AD-1146<br>Neoprene primed with CONAP® PR-11167<br>PVC Primed with CONAP® AD-1161 | | > 150<br>> 145<br>> 30<br>> 200 | piw<br>piw<br>piw<br>piw |

# CONATHANE® EN-1556

## Typical Electrical Properties

| Property | Test Method | Conditions | Value | Units |
|---|---|---|---|---|
| Dielectric Strength | ASTM D149 | 1/8" @ 25°C / 77°F | 350 | volts / mil |
| Dielectric Constant | ASTM D150 | 1 kHz @ 25°C / 77°F<br>1 MHz @ 25°C / 77°F | 6.1<br>5.1 | |
| Dissipation Factor | ASTM D150 | 1 kHz @ 25°C / 77°F<br>1 MHz @ 25°C / 77°F | 0.03<br>0.06 | |
| Volume Resistivity | ASTM D257 | 25°C / 77°F<br>121°C / 250°F | $2.4 \times 10^{12}$<br>$9.6 \times 10^{10}$ | ohm-cm<br>ohm-cm |
| Surface Resistivity | ASTM D257 | 25°C / 77°F<br>121°C / 250°F | $5.2 \times 10^{13}$<br>$3.5 \times 10^{10}$ | ohms / sq.<br>ohms / sq. |
| Insulation Resistance | MIL-M-24041C | 25°C / 77°F<br>121°C / 250°F<br>10 d @ 95% RH | 900,000<br>4,200<br>35,000 | megohms<br>megohms<br>megohms |
| Arc Resistance | MIL-M-24041C | 25°C / 77°F | > 120 | seconds |
| High Potential Resistance | MIL-M-24041C | 2,000 volts RMS @ 60 Hz | No breakdown | |
| Flame Resistance | MIL-M-24041C | 55 amps DC | No ignition | |

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.