

**CONATHANE® RN-3039**

CONATHANE® RN-3039 is a polyester-based urethane prepolymer capped with isocyanate chemical groups. Finished elastomers are formed by reacting these isocyanate groups with di- and multi functional amines or polyols to yield high molecular weight thermosetting polymers.

RN-3039 elastomers provide properties generally not available in rubber, plastic, or metal and have improved solvent and oil resistance and better thermal stability than most other "general purpose" rubbers and plastics. Other outstanding properties include high abrasion and tear resistance, excellent load-bearing capacity, toughness, and resiliency.

CONATHANE® RN-3039 is a unique engineering material that provides the materials engineer with the building blocks to enable him to meet specific requirements for his particular application. Through proper selection of a curative and a careful balancing of the stoichiometric ratio, the engineer can control such qualities as tensile and tear strength, abrasion resistance, oil and solvent resistance, load bearing and resiliency.

Typical applications include soft, solvent resistant printing rolls, industrial truck tires, metal forming pads, seals, gaskets, impellers, etc.

**TYPICAL PRODUCT CHARACTERISTICS**

	CONATHANE® RN-3039	CONACURE® AH-40	CONACURE® AH-50	MbOCA*
Color	Clear, Light Amber	Amber Liquid	Clear Liquid	Yellow Solid
Brookfield Viscosity, cps @ 25°C	Soft Solid	400	750	Solid
@ 70°C	3,000	---	---	Solid
@ 100°C	750	---	---	Liquid @ 120°C
Specific Gravity @ 100°C	1.16	---	---	1.26
NCO, %	4.3 ± 0.1	---	---	---
Equivalent Weight	---	133.3	90	133.3
Storage Stability (unopened container) (from date of manufacture)	12 Months	12 Months	12 Months	12 Months

\* MbOCA - 4,4'-Methylene-bis-(2-Chloroaniline)

**TYPICAL CURED PROPERTIES**

Properties presented below are average, based on several determinations and are not intended for specification purposes. For specification recommendations, please contact Cytec's Technical Service Department.

	RN-3039/AH-40	RN-3039/AH-50	RN-3039/MbOCA
Hardness, Shore A	90	60	90
Tensile Strength, psi	8000 (Die D)	6000 (Die C)	8500 (Die D)
100% Modulus, psi	1150	300	1400
300% Modulus, psi	1600	700	2600
Elongation, %	570	475	650
Tear Strength, pli (Die C)	570	175	600
Compression Set, % (Method B)	---	1	31
Cured Specific Gravity	1.24	1.24	1.27

**MIXING AND CURING RECOMMENDATIONS**

CONATHANE® RN-3039 (4.3% NCO), pbw	100.0	100.0	100.0
CONACURE® AH-40, pbw	12.4	--	--
CONACURE® AH-50, pbw	--	8.8	--
MbOCA, pbw	--	--	12.4
% Theory	90	95	90
Polymer Temperature, °C	60	80	80
Curative Temperature, °C	25	25	25
Initial Mixed Viscosity @ Mix Temp, cps	4500	3500	2500
Working Life, minutes	1	0.5	220
Approx. Demold Time @ 100°C hours	0.5	0.5	5
Post Cure (optimum properties) hours @ 100°C	16	16	16

**RECOMMENDED PROCESSING PROCEDURE**

- Heat pre-weighed amounts of RN-3039 to 80-100°C and degas at 1-5mm of vacuum for at least 5 minutes or until excessive bubbling stops. Containers should be unlined metal, plastic, or glass and should be large enough to allow for foaming during degassing.
- When adding MbOCA to RN-3039, the MbOCA must be melted at 120°C prior to mixing. CONACURES® AH-40 and AH-50 are liquids at room temperature and do not require preheating prior to mixing with RN-3039. After adding curative, mix thoroughly and degas at 1-5mm for 1 to 2 minutes. Please be advised that the RN-3039/AH-40 is not designed for hand batching.
- Pour mixed system into molds, preheated to 80-100°C, that have been coated with a CONAP® mold release or equivalent.
- Cure in accordance with above recommendations.
- Automatic metering and mixing equipment can be used with all the RN-3039 systems and is required with the RN-3039 / AH-40 system.

**USE OF DIFFERENT CURATIVES**

BULLETIN: R-118(d)

Page 1 of 2

Revised 12/7/01 – Supersedes R-118(c)

©2001 Cytec Industries Inc. All rights reserved.

Several other commercially available curatives can be used with RN-3039 polymer. Following are some of those curatives and their equivalent weights.

	<u>Equivalent Weight</u>
1,4 Butanediol	45
Trimethylol Propane	45
Triethylene Glycol	75
<b>CONACURE® AH-50 (Isonol 93)</b>	90
<b>CONACURE® AH-40</b>	133.3
MBOCA	133.3

To CALCULATE specific mix ratios or variations in stoichiometric ratios, the following formulation can be used.

$$\text{Example: } \frac{(\% \text{NCO of RN-3039}) \times (\text{Equivalent weight of Curative})}{42 \times \text{NCO/OH Ratio}}$$

% NCO RN-3039	- 4.3
Equivalent Weight CONACURE® AH-50	- 90
Desired NCO/OH Ratio	- 1.05 / 1.0 (95% Theory)

$$\frac{(4.3) (90)}{42 \times 1.05} = \frac{387}{44.1} = 8.775 = 8.8 \text{ parts by weight}$$

Mix Ratio (parts by weight) - RN-3039 / AH-50 - 100.0/8.8

### ADHESION

The adhesion of elastomers produced from RN-3039 polymer to various substrates may be marginal. Cytec has a complete line of primers for improving adhesion to specific substrates. Please contact our Technical Service Department for recommendations.

### COLORING

**CONAP® DS-1830** Series of four color concentrates have been specifically formulated for coloring urethane elastomers. Please request Technical Bulletin AC-112.

### HANDLING PRECAUTIONS

**CAUTION: FOR INDUSTRIAL USE ONLY!**

Use only with adequate ventilation. Avoid breathing of vapors and fumes. Prevent skin and eye contact. Curing ovens should be vented to the atmosphere.

If skin contact occurs, wash immediately with soap and warm water. In case of eye contact, flush immediately with copious amounts of water - obtain medical attention. Contaminated clothing should be removed and washed prior to re-use.

For additional information, please request MATERIAL SAFETY DATA SHEETS on RN-3039, AH-40, and AH-50 from Cytec. For curatives other than those supplied by Cytec, follow handling precautions recommended by the manufacturer.

### AVAILABILITY

CONATHANE® RN-3039 is available in 5-gallon pails (50 lbs.) and 55-gallon drums (500 lbs.). An evaluation sample is available for a nominal fee.

“CONATHANE”, “CONACURE”, and “CONAP” are registered trademarks of Cytec Industries Inc.

The information presented here is based on carefully conducted laboratory tests and is believed to be accurate. However, results cannot be guaranteed and it is suggested that customers confirm results in their own laboratory before plant tests are made. Nothing contained in this bulletin shall be construed as a recommendation to use any product or process in violation of the claims of any patent now in effect.

NOTICE: Precautionary labels and Materials Safety Data Sheet(s) for all materials referred to, whether the materials are produced by CYTEC INDUSTRIES, INC. or other manufacturers, should be fully read and understood by all supervisory personnel and employees before using. For additional safety and health information, contact CYTEC INDUSTRIES INC. Purchaser has the responsibility for determining any applicability of and compliance with federal, state, and local laws and/or regulations involving labeling, use, and waste disposal, particularly in making consumer products.