

An Emerald Performance Materials Company

## Hypro<sup>®</sup> Reactive Liquid Polymers 1300X42 ATBN Amine Terminated Butadiene-Acrylonitrile CAS #118578-02-2/15520-10-2

### DESCRIPTION

Hypro Reactive Liquid Polymers (RLP) are 100% solids liquid rubbers used to improve the toughness, flexibility, adhesion and impact resistance of thermoset resin systems including epoxies, vinyl esters, unsaturated polyesters, acrylics and urethanes. These materials are a family of butadiene homopolymers and butadiene-acrylonitrile copolymers with functionality at the chain ends. Functional groups are carboxyl (COOH), amine (NH or NH<sub>2</sub>), methacrylate or epoxy. The acrylonitrile content varies in these polymers from zero to 26% which directly affects the solubility and glass transition temperature (T<sub>g</sub>) of the materials.

Hypro 1300X42 ATBN is an amine terminated butadiene-acrylonitrile copolymer used predominately with other amine functional compounds to improve product performance when added to thermoset resin systems. The primary amine end functionality is based on -methylpentamethylenediamine.

### BENEFITS/FEATURES

- Enhances the Toughness/Flexibility of Thermoset Resins
- Adhesion Promoter for Elastomers and Fluorocarbon Rubbers
- Increases Low Temperature Mechanical Properties
- Increases Impact/Crack Resistance
- Primary Amine Group Functionality

### TYPICAL USES

- Paste Adhesives
- Rubber Compounding Additive
- Coatings
- End uses include Automotive, Electrical, Construction and Industrial Applications

### TYPICAL PROPERTIES

Appearance	Liquid polymer, amber in color (3-8 on the Gardner Color Scale)
Actives Level	100%
2 Brookfield Viscosity, mPa.s or cP @ 27° C	75,000 -125,000
Amine Equivalent Weight	375 - 525

\*To determine Weight Per Active Hydrogen, divide AEW value by 2.

### STORAGE & HANDLING

To ensure optimal product performance, store material in original unopened containers at or below 50°C.

Hypro ATBN Standard Line of Products —Typical Properties						
Hypro Polymers	2000X173 ATB	1300X21 ATBN	1300X16 ATBN	1300X45 ATBN	1300X35 ATBN	1300X42 ATBN
Acrylonitrile Content, %	0	10	18	18	26	18
Amine Equivalent Weight (AEW)*	950	1,200	900	1,850	700	450
Amine Value	59	47	62	30	80	125
Brookfield Visc., mPa.s or cP @ 27°C (81°F)	180,000	160,000	200,000	375,000	500,000	100,000
Specific Gravity, 25°/25°C (77°F)	-	0.938	0.956	-	0.978	0.942
Glass Transition Temp., Tg°C**	-	-65	-51	-	-38.	-59
Free Amine Level, %	4	2	5	<0.1	7	10

\*For secondary amine terminated polymers, AEW value may be used as Amine Hydrogen Equivalent Weight, whereas Hypro 1300X42 ATBN, a primary amine terminated material, Weight per Active Hydrogen is AEW/2.

\*\*Measured via DSC (Differential Scanning Calorimeter).

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The following Table shows some of the benefits that can be obtained when using Hypro 1300X42 ATBN in a typical formulation. Hypro 1300X42 ATBN is a primary amine terminated butadiene-acrylonitrile copolymer. It performs similarly to secondary amine terminated liquid polymers as an epoxy toughener/flexibilizer.

Typical Epoxy Formulation Using Hypro 1300X42 ATBN

Recipes	1	2
DGEBA Liquid Epoxy (EEW-190)	100	100
Tabular Alumina	40	40
Amido-Amine (Ancamide 501)*	35.8	31.5
Hypro 1300X42 ATBN	--	15
Cure: 1 Hour at 125°C		
Tensile Strength, psi (Mpa)	6,713 (46.3)	6,351 (43.8)
Tensile Elongation, %	1.70	1.97
Tensile Modulus, psi X 10 <sup>-3</sup> (Gpa)	465 (3.21)	406 (2.80)
Fracture Energy G <sub>1c</sub> ** in. lbs./in. <sup>2</sup> (J/m <sup>2</sup> )	1.67 (292)	3.55 (622)

\*Air Products

\*\*G<sub>1c</sub> is measure of the energy needed to fracture a material.

**PACKAGING & AVAILABILITY**

Hypro 1300X42 ATBN is available in 55 gal. non-returnable steel drums (net weight 400 lbs.) and 5 gal. metal pails (35 lbs. net). For further information regarding this material or any other CVC Thermoset Specialties product, please contact your local Sales Representative or our Customer Service Department at 800-296-0040.



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**Hypro® 1300X42 ATBN**

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