

## Advanced Materials

# HYPRO® 1300X45 ATBN<sup>#</sup>

### Reactive Toughener and flexibilizer

### DATA SHEET

#### Amine Terminated copoly(Butadiene-Acrylonitrile)

#### Product 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.

HYPRO® 1300X45 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 amine structure of HYPRO® 1300X45 ATBN is based on N-aminoethylpiperazine (N-AEP) - minimal source of excess amine.

#### Applications

- Adhesives
- Coatings and linings for corrosion resistance
- Construction joint sealers and mastics
- End uses include automotive, construction, electrical and industrial applications

#### Benefits

- Enhances the Toughness/Flexibility of Thermoset Resins
- Improves Adhesion to Substrates which are difficult to Bond
- Minimal Amount of Excess Amine (improved Tox profile)
- Ideal for Chain Extending Epoxies
- Provides Hydrophobicity
- Increases Low Temperature Mechanical Properties
- Increases Impact/Crack Resistance

#### Key data

#### Specified key data

Viscosity at 27 °C (Brookfield)	300 000 – 450 000	[mPa s]
Amine Equivalent weight (titration)	1750 - 1950	[g/Eq]

Specified key data are individually checked throughout and guaranteed.

#### Typical key data

Appearance	Liquid polymer, amber in color
Gardner colour	3 - 8

Data which is described in this document as 'typical' is not analyzed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

<sup>#</sup> In addition to the brand name product denomination may show different appendices, which allows us to differentiate between our production sites: e.g. BD = Germany, US = United States, IN = India, CI = China, etc. These appendices are in use on packaging, transport and invoicing documents. Generally, the same specifications apply for all versions. Please address any additional need for clarification to the appropriate Huntsman contact.

## 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), g/eq*	950	1,200	900	1,850	700	450
Amine Value	59	47	62	30	80	125
Brookfield Viscosity, mPa.s or cP @ 27 °C (81°F)	180,000	160,000	200,000	375,000	500,000	100,000
Specific Gravity @ 25/25 (77 °F)	—	0.938	0.956	—	0.978	0.942
Glass Transition Temp., °C**	—	-65	-51	—	-38	-594
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 for HYPRO 1300X42 ATBN, a primary amine-terminated material, Weight per Active Hydrogen is AEW/2.

\*\*Measured via DSC (differential scanning calorimeter).

### Typical Epoxy Formulation Using HYPRO® 1300X16 ATBN

Formulation	1	2
ARALDITE® GY 250	100	100
ARADUR® 140	60	56.4
Calcium Carbonate	30	30
HYPRO® 1300X16 ATBN	—	30

### Cured Properties

Substrate: sandblasted steel		
Cure: 2 weeks at room temperature	1	2
Lap shear strength, psi (MPa)		
@ -40 °C	1,370 (9.45)	2,260 (15.58)
@ R.T.	1,600 (11.03)	2,500 (17.24)
T-peel strength, pli (N/mm)		
@ R.T.	3.3 (0.579)	35.0 (6.14)

Cure: 2 hours @ 60 °C plus 1 hour @ 100°C		
Lap shear strength, psi, (MPa)	1	2
@ -40 °C	2,148 (14.81)	3,128 (21.57)
@ R.T.	2,550 (17.58)	2,612 (18.01)
T-peel strength, pli (N/mm)		
@ R.T.	4.2 (0.736)	40.0 (7.02)

<b>Storage</b>	<p>HYPRO® 1300X45 ATBN should be stored in a dry place, preferably in the sealed original container, at temperatures between 2 and 40 °C. The product should not be stored exposed to direct sunlight.</p> <p>Keep away from food, drink and animal feeding stuff.</p>
<b>Handling precautions</b>	<p>HYPRO® 1300X45 ATBN is amine functional material, irritation can result from repeated or prolonged contact. The symptoms of this irritation may appear as a mild reddening or a more pronounced rash. It is, therefore, important to avoid skin contact where possible. Butyl rubber gloves, full eye protection and protective clothing are recommended.</p> <p>Skin contact: Wash well with soap and water. Remove contaminated clothing and wash thoroughly before reusing. It is recommended that resin not be removed from skin with solvents since solvents increase contact and encourage penetration. Moreover, solvents of themselves dry and crack the skin.</p> <p>Eye contact: Flush immediately with large quantities of water. Contact a physician.</p> <p>Refer to the Safety Data Sheet on HYPRO® 1300X45 ATBN for additional safety and health information. The SDS is revised as new data becomes available.</p>

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