

An Emerald Performance Materials Company

Hypro[®] Reactive Liquid Polymers 1300X9 CTBNX Carboxyl Terminated Butadiene-Acrylonitrile with Pendent Carboxyl Functionality CAS #68891-50-9

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 NH₂), methacrylate or epoxy. The acrylonitrile content varies in these polymers from zero to 26% which directly affects the solubility and glass transition temperature (T_g) of the materials.

Hypro 1300X9 CTBNX is a carboxyl terminated butadiene-acrylonitrile copolymer containing pendent carboxyl functionality and is used predominately as a reactant with a base thermoset resin to gain product performance improvements. These resultant pre-reacts (adducts) can be incorporated at various levels to suit the needs of your specific formulation.

BENEFITS/FEATURES

- Enhances the Toughness/Flexibility of Thermoset Resins
- Greater Functionality than Standard CTBN Polymers
- Increases Low Temperature Mechanical Properties
- Improves Durability (Fatigue Resistance)
- Improves Adhesion to Difficult to Bond to Substrates
- Increases Impact/Crack Resistance

TYPICAL USES

- Film and Paste Adhesives (Structural and Semi-Structural Applications)
- Composites
- Polymeric Intermediate for Epoxies
- Radiation Curable Oligomers
- End uses include Aerospace, Automotive, Electrical/Electronics and Industrial Applications

TYPICAL PROPERTIES

Appearance	Liquid polymer, amber in color (2 - 7 on the Gardner Color Scale)
Actives Level	100%
Brookfield Viscosity, mPa.s or cP @ 27°C	135,000 - 185,000
Bound Acrylonitrile Content, %	15.5 - 19.5
Carboxyl Content (Equivalent Per Hundred)	0.061 - 0.073
Other:	Functionality of the material is estimated at 2.4

STORAGE & HANDLING

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

Hypro CTB, CTBN and CTBNX Standard Line of Products —Typical Properties						
Hypro Polymers	2000X162 CTB	1300X31 CTBN	1300X8* CTBN	1300X13* CTBN	1300X9 CTBNX	1300X18 CTBNX
Acrylonitrile Content, %	0	10	18	26	18	21.5
<u>Carboxyl Content:</u>						
-Acid Number	25	28	29	32	38	39
-EPhR**	0.045	0.050	0.052	0.057	0.067	0.070
Brookfield Visc. mPa.s or cP @ 27°C (81°F)	60,000	60,000	135,000	500,000	160,000	350,000
Solubility Parameter (cal/cm ³) ^{1/2} ***	8.14	8.46	8.82	9.15	8.87	8.99
Specific Gravity 25°/25° (77°F)	0.907	0.924	0.948	0.960	0.955	0.961
Functionality	1.9	1.9	1.8	1.8	2.4	2.4
Molecular Weight, Mn	4,200	3,800	3,550	3,150	3,600	3,400
Glass Transition Temp., Tg, °C****	-77	-66	-52	-39	-52	-46

* An FDA version of this polymer is also available.

** Equivalents per hundred rubber. *** Calculations based on molar attraction constants.

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



An Emerald Performance Materials Company

Hypro[®] 1300X9 CTBNX

PACKAGING & AVAILABILITY

Hypro 1300X9 CTBNX is available in 55 gal. non-returnable steel drums (net weight 425 lbs.) and 5 gal. plastic 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.

DISCLAIMER

The information contained herein is believed to be reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or the results to be obtained there from. The information is based on laboratory work with small-scale equipment and does not necessarily indicate end product performance. Because of the variations in methods, conditions, and equipment used commercially in processing these materials, no warranties or guarantees are made as to the suitability of the products for the applications disclosed. Full-scale testing and end product performance are the responsibility of the user. CVC Thermoset Specialties shall not be liable for and the customer assumes all risk and liability of any use or handling of any material beyond CVC's direct control. THE SELLER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Nothing contained herein is to be considered permission, recommendation, nor as an inducement to practice any patented invention without permission of the patent owner. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

CVC Thermoset Specialties—844 N. Lenola Road/Moorestown, NJ 08057
An Emerald Performance Materials Company

© Copyright 2006 Emerald Performance Materials LLC. 6/2006

CVC Thermoset Specialties

844 North Lenola Road / Moorestown, NJ 08057 / Phone: 856-533-3000 / Fax: 856-533-3003 / www.cvcthermoset.com