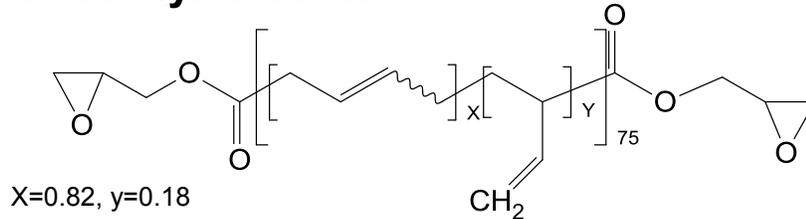


An Emerald Performance Materials Company

## Hypro<sup>®</sup> 2000X174 ETB Diglycidyl Ester of Polybutadiene



### DESCRIPTION

Hypro (f.k.a. Hycar<sup>®</sup>) 2000X174 ETB is an epoxy-functional synthetic rubber. It is the reaction product of epichlorohydrin and Hypro 2000X162 Carboxyl-Terminated polybutadiene (CTB).

It is a 100%-solids, reactive polymer designed to incorporate synthetic rubber into a thermoset matrix by reacting it with conventional epoxy hardeners.

### FEATURES & BENEFITS

Hypro Reactive Liquid Polymers set the industry standard for rubber-toughening epoxy, acrylic, vinyl ester and unsaturated polyester in neat resins, adhesives, coatings and composites.

Hypro 2000X174 ETB differs from typical epoxy-functional elastomeric tougheners. The typical products consist of 50%-to-95% epoxy resin reacted onto the rubber. Hypro 2000X174 ETB is free of epoxy resin. It is 100% reactive rubber.

Hypro 2000X174 ETB is designed for epoxy adhesives and coatings. The polybutadiene backbone provides toughness, flexibility, low-temperature properties, and impact resistance to the cured formulation. It also contributes excellent resistance to moisture, acids and bases.

Hypro 2000X174 ETB is the glycidyl ester of polybutadiene. It has the least polarity of the family of rubber tougheners. It is the least miscible with the cured epoxy resin matrix, so it provides the highest level of particulate separation and the highest level of toughness improvement with the least decline in glass transition temperature.

### TYPICAL PROPERTIES

Hypro 2000X174 ETB has the lowest viscosity of the Hypro ETB(N) polymers, and it yields a lower mixed viscosity than the epoxy-rubber adducts in the uncured system.

<b>Hypro 2000X174 ETB Typical Properties &amp; Characteristics</b>	
Molecular weight	4350
% Butadiene	100%
% Acrylonitrile	0%
Viscosity, cps @ 27 °C	15k-30k
Viscosity, cps @ 52 °C	2k-4k
Epoxy equiv weight, g/eq	2200-3200
Functionality	1.9
Gardner color	≤7
Non volatile, %	>99
Acid number, mgKOH/g	<0.1

### PACKAGING & AVAILABILITY

Hypro 2000X174 ETB is available in 55-gallon, non-returnable, open-head steel drums (400 lb net) and 5-gallon plastic pails (40 lb net).

Please contact your sales representative or our customer service (CTS.customerservice@emeraldmaterials.com or 800-296-0400) for more information.

An Emerald Performance Materials Company

## APPLICATIONS

Hypro 2000X174 ETB acts as an effective toughener at 5-to-20 parts per hundred epoxy resin. It has limited solubility/miscibility in standard liquid Bis-A and Bis-F resins. It will separate over time, so it must be cured soon after mixing in unfilled systems.

It can be effective and more stable in filled and highly compounded epoxy systems in which it is compatible with the fillers, thixotropic additives, and other components. It is miscible with these pre-reacted systems, and it forms distinct rubber domains when cured. These micron-size rubber particles provide the key performance benefits.

The key property improvements in epoxy adhesives, sealants, coatings:

- Low-temperature properties
- Impact and crack resistance
- T-Peel and Lap Shear adhesion
- Durability (fatigue resistance)
- Thermal-cycling tolerance
- Chip resistance and fracture toughness

The insolubility in standard liquid resins ensures that Hypro 2000X174 ETB has very little solubility in the cured system. It does not act a flexibilizer, so it does not significantly reduce the epoxy strength and lower the glass transition temperature.

## DISCLAIMER

The information contained here in 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 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 OF 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.

## HANDLING & SAFETY

The standard shelf life is 12 months in unopened container stored at temperatures below 35°C. Store Hypro 2000X174 ETB at room temperature to ensure optimal product performance. Store this away from incompatible substances—epoxy hardeners and chemical cross-linkers.

Use good laboratory/workplace procedures as you would with any industrial chemical. Refer to the CVC Thermoset Specialties MSDS for additional safety and handling information.

Hypro 2000X174 ETB is not a primary skin irritant or sensitizer. However, as with any epoxy 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 important to avoid skin contact. We recommend butyl rubber gloves, full eye protection and protective clothing.