HEXION

Technical Data Sheet

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HELOXY™ Modifier 48

Product Description

HELOXY™ Modifier 48 is a low viscosity aliphatic triglycidyl ether useful in the viscosity, reactivity, and performance modification of epoxy resin systems.

Application Areas/Suggested Uses

- Fast setting adhesives
- Low temperature curing floor surfacing and concrete patching compounds
- Hard, abrasion resistant clear castings and decoupage systems

Benefits

- Reduces viscosity but retains reactivity of conventional and polyfunctional epoxy resins
- Imparts hardness and toughness to epoxy systems cured with low functionality curing agents
- Improves solubility/compatibility characteristics of highly aromatic epoxy resins without reducing functionality

Sales Specification

Property	Units	Value	Test Method/Standard
Weight per Epoxide	g/eq	138-154	ASTM D1652
Viscosity at 25°C	cP	120-180	ASTM D445
Color	Gardner	2	ASTM D1544

Typical Properties

Property	Units	Value	Test Method/Standard
Density	lbs/gal	9.55-9.70	ASTM D1475

General Information

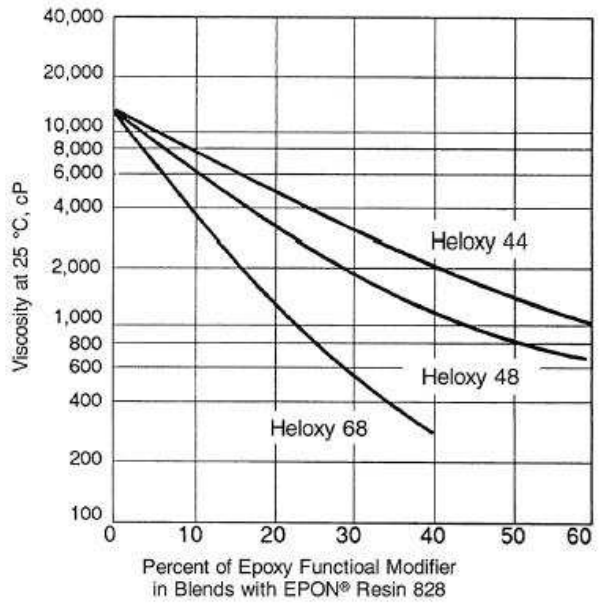
HELOXY Modifier 48 is compatible with all types of epoxy resins and serves to reduce viscosity while preserving reactivity and physical strength. Figure 1 plots the viscosity reduction efficiency of HELOXY Modifier 48. Data listed in Table 1 reflect the effect on reactivity, mechanical, electrical and chemical resistance properties and modifications with this resin.

HELOXY Modifier 48 is an effective modifier for liquid polyfunctional epoxy resins, as viscosity is reduced with a minimal reduction in resin functionality.

In blends with basic liquid epoxy resin, HELOXY Modifier 48 improves the toughness of formulations utilizing low functionality curing agents such as EPIKURE™ Curing Agents 3270 and 3274 by providing a higher cross-link density.

HELOXY Modifier 48 may be used with all classes of curing agents, including aliphatic amines, mercaptans, polysulfides, aromatic amines, and anhydrides. As previously mentioned, this triepoxide is particularly useful in epoxy resin systems cured with low functionality curing agents such as EPIKURE 3270 and EPIKURE 3274.

Figure 1 / **Viscosity reduction with HELOXY Modifiers**



Performance Properties

Table 1 / **Typical Properties of epoxy resin systems modified with HELOXY Modifier 48**

	Method	Units	A	B	C	D
Composition (parts by wt)						
EPON™ Resin 828		pbw	100	60	60	60
HELOXY Modifer 48		pbw	---	40	40	40
EPIKURE Curing Agent 3072		pbw	35	38	---	38
EPIKURE Curing Agent 3071		pbw	---	---	19	---

Handling Properties at 25°C

Viscosity, Resin Portion		cP	10,000	1,420	1,420	1,420
Viscosity, Total System		cP	4,000	1,070	---	1,070
Gel time, 100 gram mass @ 25°C		minutes	40	45	10	45
Peak Exotherm, 100 gram mass		°C	157	168	Decomposed	168
Cured State Properties [1]						
Heat Deflection Temperature	ASTM D648	°C	75	62	89	56
Tensile strength	ASTM D638	psi	9,900	8,200	10,900	8,300
Tensile elongation at Break		%	6.5	12	4.8	10
Flexural Strength	ASTM D790	psi	15,300	13,300	18,700	---
Initial Flexural Modulus		ksi	450	420	550	410
Ultimate Compressive Strength		psi	34,100	32,700	---	16,000
Compressive Yield Strength		psi	13,000	11,100	---	11,100
Izod Impact – notch	ASTM D256	ft.•lb./inch	0.44	0.60	0.56	0.59
Hardness	ASTM D2240	Shore D	88	84	87	82
Chemical Resistance [2]						
Distilled Water		%	0.16	0.33	0.21	0.43
5% Acetic Acid		%	0.29	1.58	0.81	1.99
Solvent [3]		%	0.06	0.53	0.55	---
Weight Loss [4]		%	0.19	0.24	0.50	0.35
Electrical Properties						
Dielectric Constant [5]	ASTM D150		3.76	3.79	4.23	3.80
Dissipation Factor [5]			0.024	0.025	0.037	0.024
Volume Resistivity, at 25 °C		ohm•cm	1.6 (10^{16})	4.9 (10^{15})	8.1 (10^{14})	3.7 (10^{15})

[1] Determined on 1/8” thick specimens tested at 25 °C. Systems A, B and C were cured for 16 hours at 25 °C followed by 2 hours at 93 °C.
System D was cured for 2 weeks at 25 °C.
[2] Percent weight gain after immersion for 24 hours at 25 °C.
[3] 50 percent Xylene/50 percent Isopropanol.
[4] Percent weight loss after 24 hours at 150 °C.
[5] Measured at 1 Hertz and 25 °C.

Safety, Storage & Handling
Please refer to the MSDS for the most current Safety and Handling information.

Please refer to the Hexion web site for Shelf Life and recommended Storage information.

HELOXY Modifier 48 should be stored in tightly sealed containers, in a dry location at normal room temperatures. As with other epoxy resins, systems containing HELOXY Modifier 48 can crystallize during storage. The tendency to do so is affected by storage conditions, composition and other factors. Should crystallization occur, it may be converted to liquid by opening the drum bung and gently warming to temperatures not to exceed 50 °C (122 °F).

Exposure to these materials should be minimized and avoided, if feasible, through the observance of proper precautions, use of appropriate engineering controls and proper personal protective clothing and equipment, and adherence to proper handling procedures. **None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheet (MSDS) for these and all other products being used are understood by all persons who will work with them.** Questions and requests for information on Hexion Inc. ("Hexion") products should be directed to your Hexion sales representative, or the nearest Hexion sales office. Information and MSDSs on non-Hexion products should be obtained from the respective manufacturer.

Packaging
Available in bulk and drum quantities.

Contact Information
For product prices, availability, or order placement, call our toll-free customer service number at:
1-877-859-2800

For literature and technical assistance, visit our website at: www.hexion.com

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