MOMENTIVE

Technical Data Sheet

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HELOXY™ Modifier 62

Product Description
HELOXY™ Modifier 62 is a commercial grade of o-cresyl glycidyl ether. A low viscosity aromatic monoepoxide, its primary use is the viscosity reduction of conventional epoxy resin systems.

Benefits

- Reduces viscosity of higher molecular weight aromatic epoxy resins
- Excellent retention of mechanical and chemical resistance cured state properties relative to other monoepoxides
- Low volatility
- Improves substrate and filler wetting of conventional formulations

Sales Specification

Property	Units	Value	Test Method/Standard
Weight per Epoxide	g/eq	175-195	ASTM D1652
Viscosity at 25°C	cP	5-10	ASTM D445
Color	Gardner	2	ASTM D1544
Epichlorohydrin	mg/kg	10	SMS 2445

Typical Properties

Property	Units	Value	Test Method/Standard
Density	lbs/gal	8.9-9.1	ASTM D1475

General Information
HELOXY 62 is compatible with virtually all classes of epoxy resins used in thermoset plastics and protective coatings applications.

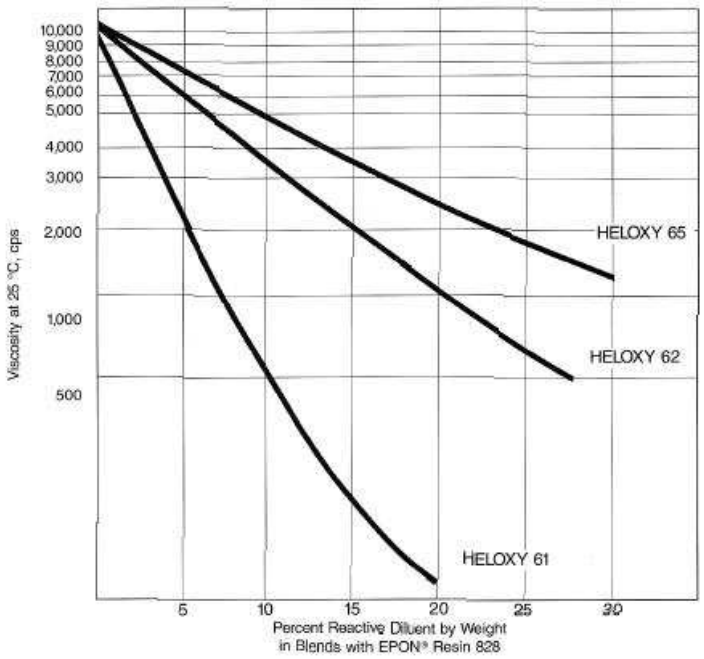
As with any monoepoxide, modification of basic epoxy resins with HELOXY 62 reduces the average epoxide functionality of the mixture thereby lowering cured state chemical and solvent resistance and thermal performance. However, due to the highly aromatic structure of HELOXY 62, compromises in these

properties are found to be minimized relative to those associated with other monoepoxides commonly used in the viscosity reducing modification of epoxy formulations.

The relatively low molecular weight of HELOXY 62 makes it among the most efficient of the aromatic monoepoxides in reducing viscosity of basic epoxy resins. A comparison of this characteristic to that of other representative Heloxy modifiers is illustrated in Figure 1. Since the degree to which performance properties are affected depends on the amount of Heloxy 62 in the formulation, the amount used should be limited to that necessary to yield the required viscosity reduction. The maximum recommended quantity of Heloxy 62 is about 30 percent of the resin portion. Curing agents that are recommended for satisfactory crosslinking of unmodified basic liquid epoxy resins can also be used with compositions containing HELOXY 62. Since the average weight per epoxide of HELOXY 62 is virtually identical to that of commercial liquid bisphenol A-based epoxy resins, differences in epoxy content due to HELOXY 62 modifications are normally insignificant and adjustments in curing agent combining ratio to maintain proper stoichiometry with HELOXY 62 modified blends is usually unnecessary.

As previously stated, the cured state properties at room temperature of epoxy formulations are not seriously affected when viscosity reduction is attained via HELOXY 62 unless excessive amounts are used. However, performance at elevated service temperatures may be reduced considerably. Data listed in Table 1 illustate the effect of HELOXY 62 on systems cured with various curing agents, including conventional polyamines, anhydrides, and EPIKURE™ 3072 Curing Agent. A preblend of HELOXY 62 and a standard bisphenol A based epoxy resin at a viscosity selected for ease of handling is available as EPON™ Resin 813. For information on the properties and suggested uses of this resin, please consult the appropriate product bulletin.

Figure 1 / **Viscosity dilution effectiveness of HELOXY Modifiers**



Performance Properties

Table 1 / **Typical Properties of epoxy resin systems containing HELOXY Modifier 62**

	Method	Units	A	B	C	D	E	F
Composition								
EPON Resin 828		pbw	100	90	80	77	70	77
HELOXY Modifier 62		pbw	–	10	20	23	30	23
EPIKURE 3234		pbw	12.9	13	13.5	–	–	–
EPIKURE 3072 Curing Agent		pbw	–	–	–	35	35	–
Hexahydrophthalic Anhydride		pbw	–	–	–	–	–	78
Diethylaminoethanol		pbw	–	–	–	–	–	0.5
Handling Properties at 25°C								
Viscosity, Resin Portion		cP	13,250	3,100	1,060	1,000	470	1,000
Gel time, 100g @ 23 °C		min.	44	43	45	52	57	–
¼ in. thick, @ 93 °C		min.	–	–	–	–	–	75
Peak Exotherm, 100g @ 23 °C		°C	223	223	211	168	147	–
Cured State Properties [1]								
Heat Deflection Temperature	ASTM D648	°C	103	86	69	64	58	98
Tensile strength, Ultimate	ASTM D638	psi	10,050	11,400	11,300	9,600	8,400	13,300
Tensile elongation at Break		%	3.7	5.3	6.3	5.2	10.5	5.9
Tensile Modulus, Initial		ksi	450	500	570	460	430	550
Flexural Strength, Ultimate	ASTM D790	psi	18,700	20,200	20,900	14,300	12,400	22,000
Flexural Modulus, Initial		ksi	470	510	580	420	360	530
Compressive Strength, Ultimate	ASTM D695	psi	33,400	27,900	30,300	19,000	19,000	34,000
Compressive Yield Strength		psi	15,650	14,900	15,500	13,600	11,700	16,400
Izod Impact – notch	ASTM D256	ft.•lb./inch	0.45	0.45	0.40	0.47	0.43	0.38
Weight Loss, 24 hrs. @ 150		%	0.24	0.8	1.55	1.44	2.06	0.15

°C

Percent Absorbtion [2]								
Water		%						
24 hrs.			0.168	0.08	0.07	0.17	0.19	0.07
1 week			0.38	0.26	0.25	0.47	0.52	0.20
5% Acetic Acid		%						
24 hrs.			0.21	0.20	0.19	0.77	0.82	0.07
1 week			0.58	0.61	0.74	1.97	2.13	0.21
Solvent [3]		%						
24 hrs.			0.02	-0.08	-0.05	7.55	10.8	0.07
1 week			0.05	-0.17	-0.09	–	–	0.51
Dielectric Constant [4]	ASTM D150		3.91	3.80	3.83	3.65	3.68	3.48
Dissipation Factor [4]			0.031	0.020	0.017	0.013	0.013	0.011

[1]Determined on 0.125 thick specimens at 23 °C. Systems A through C cured 16 hours at 25 °C plus 2 hours at 100 °C. Systems D and E cured 14 days at 25 °C. System F cured 2 hours at 93 °C plus 2 hours at 200 °C.
[2]Weight gain of 3 inch x 1 inch x 0.125 inch specimens totally immersed in reagent at 25 °C.
[3]50:50 by weight mix of isopropanol and xylene.
[4]Determined at 106 hertz.

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

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

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