

Technical Data Sheet

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HELOXY™ Modifier 68

Product Description

HELOXY™ Modifier 68 is a diglycidyl ether of neopentyl glycol and is primarily used as a reactive diluent or viscosity reducing modifier for all classes of epoxy resins.

Application Areas/Suggested Uses

- To improve air release and wetting characteristics in electrical potting, encapsulation, and impregnation applications.
- To maintain high reactivity yet provide workable viscosity at room temperature when using epoxy novolac or other high functionality epoxy resins.

Benefits

- Reduces viscosity while maintaining most cured state properties
- Improves wetting characteristics
- Facilitates air release

Sales Specification

Property	Units	Value	Test Method/Standard
Weight per Epoxide	g/eq	130-145	ASTM D1652
Viscosity at 25°C	cP	13-25	ASTM D445
Color	Gardner	1	ASTM D1544
Epichlorohydrin	mg/kg	10	SMS 2445

Typical Properties

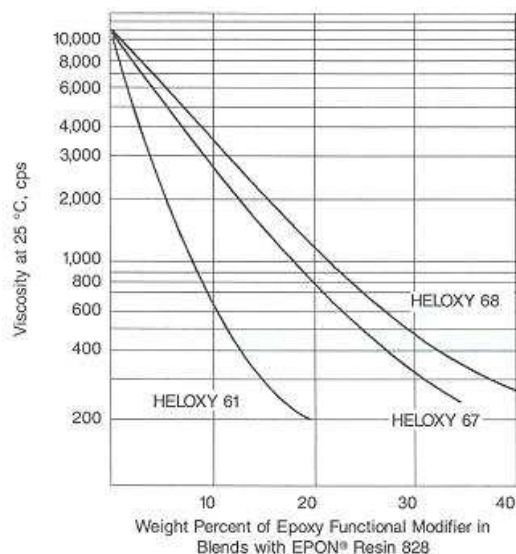
Property	Units	Value	Test Method/Standard
Density	lbs/gal	8.8-9.0	ASTM D1475
Flash Point, Setflash	°F	>200	

General Information

HELOXY Modifier 68 is compatible with bisphenol- based epoxy resins, peroxidized olefins, and higher functionality epoxy resins. Concentrations of up to 40 percent of HELOXY Modifier 68 have been employed for viscosity reduction. Performance properties of systems containing this resin are maintained at higher modifier concentrations than is possible with monoepoxide diluents.

Effects of HELOXY Modifier 68 modification on the properties of various EPON™ Resin 828 based systems is demonstrated by data presented in Table 1. Substituting HELOXY Modifier 68 for EPON Resin 828 or other unmodified resins generally results in slight increases in flexibility. As with all diluting modifiers, use of HELOXY Modifier 68 decreases chemical resistance and elevated temperature performance. To minimize such losses, the lowest concentration of HELOXY Modifier 68 necessary to obtain desired reduction in viscosity should be used. The viscosity reduction efficiency of HELOXY Modifier 68 when blended with EPON Resin 828 is compared to that of other HELOXY modifiers by data illustrated in Figure 1.

Figure 1 / **Viscosity Dilution Effectiveness of HELOXY Modifiers**



When formulating with HELOXY Modifier 68, the concentration of curing agent to be used will likely be different than in the case of an unmodified system. The proper curing agent combining ratio should always be calculated in order to ensure proper stoichiometric balance.

Performance Properties

Table 1 / **Typical Properties of epoxy resin systems containing HELOXY Modifier 68**

Composition	Method	Units	Aliphatic Amine		Anhydride	
			A	B	C	D
EPON Resin 828		pbw	100	80	100	80
HELOXY Modifier 68		pbw	–	20	–	20
EPIKURE Curing Agent 3234		pbw	12.9	14	–	–
Methyltetrahydrophthalic Anhydride		pbw	–	–	79	85
Diethylaminoethanol		pbw	–	–	0.5	0.5

Handling Properties at 25°C

Viscosity, Resin Portion		cP	13,250	1,415	11,000	1,320
Gel time, 100g @ 23 °C						
at 23 °C, 100 g		min.	44	45	–	–
at 93 °C, 1/4 inch thick		min.	–	–	–	–
at 150 °C, stroke method		min.	–	–	5.2	6.0
at 170 °C, stroke method		min.	–	–	–	–
Peak Exotherm, 100g @ 23 °C		°C	223	222	–	–

Cured State Properties ¹

Heat Deflection Temperature	ASTM D648	°C	67	67	117	99
Tensile strength, Ultimate	ASTM D638	psi	9,600	11,500	13,500	12,900
Tensile elongation at Break		%	1.7	3.4	6.3	6.6
Tensile Modulus, Initial		ksi	590	520	510	490
Flexural Strength, Ultimate	ASTM D790	psi	16,700	18,000	21,900	21,000
Flexural Modulus, Initial		ksi	570	530	480	510
Compressive Strength, Ultimate	ASTM D695	psi	19,100	13,000	46,000	35,000
Compressive Yield Strength		psi	10,100	9,600	16,500	16,100
Izod Impact – notch	ASTM D256	ft. • lb./in.	0.40	0.47	0.43	0.52
Weight Loss, 24 hrs. @ 150 °C		%	0.29	0.30	0.04	0.07

Percent Absorbtion ²

Water		%				
24 hrs.			0.17	0.21	0.14	0.13
1 week			0.46	0.56	0.34	0.33
5% Acetic Acid		%				
24 hrs.			1.53	3.46	0.13	0.13

1 week		4.83	8.55	0.34	0.32
Solvent ³	%				
24 hrs.		0.88	2.04	0.04	0.05
1 week		1.97	3.76	0.09	0.19
Dielectric Constant ⁴	ASTM D150	4.26	4.26	3.61	3.66
Dissipation Factor ⁴		0.022	0.026	0.014	0.016

¹Determined 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.

²Weight gain of 3 inch x 1 inch x 0.125 inch specimens totally immersed in reagent at 25 °C.

³50:50 by weight mix of isopropanol and xylene.

⁴Determined at 106 hertz.

Safety, Storage & Handling

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.

Some epoxy material 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 Momentive Specialty Chemicals Inc. ("Momentive") products should be directed to your Momentive sales representative, or the nearest Momentive sales office. Information and MSDSs on non-Momentive products should be obtained from the respective manufacturer.

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Contact Information

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