Technical Data Sheet

EPIKURE™ Curing Agent 3277

Product Description

EPIKURE™ Curing Agent 3277 is a moderately reactive curing agent for epoxy resins. It is low in viscosity, water insensitive, and resists “blushing” and “sweat-out” even under high humidity conditions.

Application Areas/Suggested Uses

- Damp surfaces

Benefits

- Systems designed for underwater application and/or cure
- Waterborne epoxy resin formulations
- Solventless high-build coatings
- Wet lay-up laminating compounds
- Glaze coat and binder for sand-filled, trowel-applied floor toppings
- High solids coatings

Sales Specifications

Property	Value	Unit	Test Method
Amine as KOH	280 - 313	mg/g	ASTM D2896
Color	5 max.	Gardner	ASTM D1544

Typical Properties

Property	Value	Unit
Equivalent Weight Approx.	92	
Pounds/Gallon @ 25°C	8.01	lbs/gal
Viscosity at 25°C	275	cP

Performance Properties

Table 1 / Properties of Diluent-Containing Resin Systems Cured with EPIKURE Curing Agent 3277

	Method	Units	A	B	C	D	E	F
EPON™ Resin 828		pbw	100	88	90	85	85	88

	Method	Units	A	B	C	D	E	F
HELOXY™ Modifier 62		pbw	---	12	---	---	---	12
HELOXY Modifier 8		pbw	---	---	10	---	---	---
HELOXY Modifier 48		pbw	---	---	---	15	---	---
HELOXY Modifier 505		pbw	---	---	---	---	15	---
EPIKURE Curing Agent 3277		pbw	49	49	47	50	43.9	36.8
EPIKURE Curing Agent 3271		pbw	---	---	---	---	---	4.1
Handling Properties @ 23°C								
Viscosity, Initial		cP	2,300	1,150	1,000	1,600	1,790	875
Gel Time, 100 gram mass		minutes	47	60	65	42	58	41
Peak Exotherm at 23°C, 100 grams		°C	301	293	246	303	224	355
		°F	149	145	119	151	107	179
Cure Schedule		wk/°C	2/23	2/23	2/23	2/23	2/23	2/23
Cured State Properties [1]								
Heat Deflection Temperature	ASTM D648	°C	59	48	49	55	46	58
Tensile Strength	ASTM D638	psi	8,700	6,400	5,500	6,900	5,400	8,300
Tensile Elongation		%	2.4	25	40	45	22	2.3
Tensile Modulus		ksi	470	470	260	340	290	400
Flexural Strength	ASTM D790	psi	15,500	11,000	9,400	12,100	8,300	13,700
Flexural Modulus		ksi	490	400	320	390	250	460
Flexural Deflection		inches	0.24	>0.6	>0.6	>0.6	>0.6	0.18

	Method	Units	A	B	C	D	E	F
Compressive Strength Ultimate		psi	14,200	16,500	18,000	15,800	21,200	15,400
Compressive Strength Yield		psi	13,800	11,800	9,700	12,200	7,200	15,400
Izod impact, notched	ASTM D256	ft.•lb./in.	0.34	0.42	0.44	0.42	0.44	0.41
Hardness		Shore D	87	85	83	87	83	88
Chemical Resistance [2]								
Water		%	0.13	0.08	0.10	0.17	0.18	0.10
5% Acetic Acid		%	0.44	0.29	0.38	0.83	0.48	0.27
Xylene		%	1.43	6.06	4.68	2.51	4.25	1.04

[1] Determined on 1/8" thick test specimens cured two weeks at 23 °C.

[2] Reported as percent weight gain after immersion for 24 hours at 23 °C.

Table 2 / Properties of Epoxy Resin Systems Cured with EPIKURE Curing Agent 3277

	Method	Units	A	B	C	D
EPON Resin 828		pbw	100	---	100	100
EPI-REZ™ Resin WD-510		pbw	---	100	---	---
EPIKURE Curing Agent 3277		pbw	49	46	28.1	29.7
EPIKURE Curing Agent 3271		pbw	---	---	7.0	---
EPIKURE Curing Agent 3270		pbw	---	---	---	29.7
Handling Properties @ 23°C						
Viscosity, Initial		cP	2,300	2,800	2,300	3,400
Gel Time, 100 gram mass		minutes	47	47	23	18
Peak Exotherm at 23°C, 100 grams		°C	301	305	369	336

	Method	Units	A	B	C	D
		°F	149	152	187	169
Cure Schedule		wk/°C	2/23	2/23	2/23	2/23
Cured State Properties [1]						
Heat Deflection Temperature	ASTM D648	°C	59	60	62	67
Tensile Strength	ASTM D638	psi	8,700	7,200	9,400	9,400
Tensile Elongation		%	2.4	4.3	1.7	2.8
Tensile Modulus		ksi	470	350	550	470
Flexural Strength	ASTM D790	psi	15,500	10,500	15,900	15,700
Flexural Modulus		ksi	490	310	560	430
Flexural Deflection		inches	0.24	>0.6	0.15	0.23
Compressive Strength Ultimate		psi	14,200	---	14,600	11,600
Compressive Strength Yield		psi	13,800	---	14,600	11,600
Izod impact, notched	ASTM D256	ft.•lb./in.	0.34	0.46	0.38	0.39
Hardness		Shore D	87	85	88	87
Chemical Resistance [2]						
Water		%	0.13	0.23	0.11	0.12
5% Acetic Acid		%	0.44	0.62	0.40	0.54
Xylene		%	1.43	2.86	0.32	0.49

[1] Determined on 1/8" thick test specimens cured two weeks at 23 °C.

[2] Reported as percent weight gain after immersion for 24 hours at 23 °C.

General Information

Even under high humidity conditions, systems containing EPIKURE Curing Agent 3277 have good resistance to sweat-out, no overnight tack, and have good adhesion to a variety of substrates, including damp and submerged substrates.

EPIKURE Curing Agent 3277 is compatible in all proportions with liquid epoxy resins and does not require an induction period to produce glossy surfaces which are free from amine carbonate salts. The curing agent, when combined with an epoxy resin, gives fast cure development with good solvent resistance. Due to the difference in viscosities between this curing agent and most liquid epoxy resins, it may take longer than usual to achieve thorough blending. A mixing period of 3 minutes is usually adequate to ensure a homogeneous solution of resin and curing agent.

The handling characteristics and cured state properties of the compositions presented in Tables 1 and 2 illustrate the versatility of EPIKURE 3277 systems. While monoepoxide diluent modification of resins used in conjunction with EPIKURE Curing Agent 3277 is an effective means of formulating low viscosity, flexible thermosetting systems, care should be taken in selecting the concentration of modifier to be employed.

As seen in Table 1 data, excessive amounts of monoepoxide diluent result in significant reductions in crosslink density, causing reduced heat distortion temperature and solvent resistance.

Polyepoxide diluents, such as HELOXY™ Modifier 505 and HELOXY Modifier 48, are effective viscosity reducers which impart some flexibility and which have a minimal effect on other cured state properties (Table 1).

Flow control agents such as urea-formaldehyde resin, colloidal silica, SR-82 silicone resin[1] Modaflow[2] or various thixotropes should be incorporated into high-build coatings to ensure good film continuity.

EPIKURE Curing Agent 3277 can be blended with EPI-REZ™ Resin WD-510 to produce a water dispersible mixture for applications where the use of conventional diluents is not feasible (Table 2).

Cure rate is proportional to application thickness and temperature. For 7 mil films, EPON™ Resin 828/EPIKURE Curing Agent 3277 systems cure tack-free in approximately 9 hours at 23 °C. Monoepoxide diluent modifications generally extend the working life and prolong the necessary cure period. Polyepoxide diluents, such as HELOXY Modifier 48, maintain or decrease cure time. Flexibilizers, such as HELOXY Modifier 505, will extend cure time (Table 1).

If increased reactivity is desired, EPIKURE Curing Agent 3270 or EPIKURE Curing Agent 3271 can be blended with EPIKURE Curing Agent 3277 (Tables 1 and 2).

[1] Supplied by General Electric Company.

[2] Supplied by Monsanto Company.

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.

EPIKURE Curing Agent 3277 should be stored in tightly sealed containers of metal, glass, or polyolefin plastic at normal room temperature. The curing agent may darken during long-term storage, the extent of color formation depending on storage temperature and exposure to air.

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

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