

Technical Data Sheet

EPON™ Resin 8021

Product Description

EPON™ Resin 8021 is a very low viscosity resin possessing excellent wetting characteristics and rapid reaction rates with aliphatic amine curing agents over a broad temperature range. This combination of properties makes EPON 8021 an excellent choice for use in adhesives for bonding difficult-to-wet substrates, low temperature applied flooring compounds, rapid setting sealing compounds, and pressure injection systems.

Aliphatic amine cured EPON 8021 compositions are characterized by tough flexible cures reflecting a good combination of mechanical properties.

As a modifier for basic liquid epoxy resins, EPON 8021 imparts to the composition a unique combination of reduced viscosity, fast cure, and flexibility.

The excellent wetting characteristics of this resin are readily apparent when applied in bondline thicknesses to metal, plastic, damp concrete, and other difficult-to-wet substances. This property is manifest in exceptionally high bond strength to many such materials.

Sales Specifications

Property	Value	Unit	Test Method
Color	1 max	Gardner	ASTMD1544
Viscosity at 25°C	85 - 115	cP	ASTMD445
Weight per Epoxide	300 - 320	g/eq	ASTMD1652

Typical Properties

Property	Value	Unit	Test Method
Combining Equivalent Weight	150		
Density at 25°C	9.2	lb/gal	ASTMD1475

Performance Properties

The cured state properties obtained from aliphatic amine cured EPON 8021 alone and in combination with various levels of EPON Resin 828 are listed in Table 1.

Table 1/Cured State Properties of EPON™ Resin 8021 Systems

	Method	Units	A	B	C	D	E	F
EPON™ Resin 8021		pbw	100	75	50	25	60	60
EPON Resin 828		pbw	---	25	50	75	40	40
EPIKURE™ Curing Agent 3234		pbw	16.0	15.2	14.3	13.5	---	---

EPON Resin 8021
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Generated: October 23, 2021
 Issue Date:
 Revision: 9/1/2001 12:00:00 AM

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	Method	Units	A	B	C	D	E	F
EPIKURE Curing Agent 3295		pbw	---	---	---	---	29	---
EPIKURE Curing Agent 3271		pbw	---	---	---	---	---	17
Handling Properties								
Resin Viscosity at 25°C		cP	100	220	610	2,000	450	450
Gel Time at 25°C, 100 grams		min.	13	14	17	23	16	5.5
Peak Exotherm at 25°C, 100 grams		°C	73	---	182	---	154	194
Cure Schedule								
		wks/°C	2/25	2/25	2/25	2/25	2/25	2/25
Cured State Properties ¹								
Heat Deflection Temperature	ASTM D648	°C	45	54	55	58	60	60
Tensile Strength	ASTM D638	psi	6,200	8,900	10,200	11,100	9,200	10,200
Tensile Elongation at break		%	21	4.4	4.2	4.2	4.6	4.0
Flexural Strength	ASTM D790	psi	9,000	14,000	16,700	17,000	14,000	15,000
Flexural Modulus, Initial		ksi	0.29	0.43	0.50	0.54	0.48	0.50
Compressive Strength, ultimate		ksi	30	24	21	18	16	26
Compressive Strength, yield		ksi	8.4	11.3	13	14.5	10.6	12.9
Izod Impact, notch	ASTM D256	ft. •lb./inch	0.59	0.94	1.05	1.03	0.28	0.57
Hardness		Shore D	80	82	84	84	82	84
Chemical Resistance ²								
Distilled Water		%	0.29	0.22	0.16	0.15	0.22	0.19

EPOX Resin 8021

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	Method	Units	A	B	C	D	E	F
5% Acetic Acid		%	2.31	1.60	0.94	0.92	1.41	0.37
5% NaOH		%	0.28	0.20	0.16	0.15	0.21	0.18
Solvent ³		%	1.55	1.00	0.18	0.17	0.53	0.43
Weight Loss ⁴		%	2.68	1.76	1.11	0.58	1.93	2.04
Electrical Properties								
Dielectric Constant ⁵	ASTM D150		3.98	4.02	4.10	4.12	4.08	4.21
Dissipation Factor ⁵			0.033	0.029	0.027	0.023	0.029	0.026
Volume Resistivity		ohm•cm	4.6 x 10 ¹⁵	1.2 x 10 ¹⁶	1.9 x 10 ¹⁶	1.6 x 10 ¹⁶	2.7 x 10 ¹⁶	6.2 x 10 ¹⁶

¹ Castings were 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 50 °C.

⁵ Determined at 100 Hertz and 25 °C.

General Information

EPON 8021 is a highly reactive multifunctional resin containing both epoxide groups and reactive unsaturation. Unlike conventional epoxy resins, polymerization can occur with moderate heating. The temperature of EPON 8021 should not exceed 50 °C during storage, mixing or grinding operations.

The use of typical epoxy diluents or alkaline fillers with EPON 8021 Epoxy Resin may also result in polymerization. Therefore, it is important that any modifier be carefully screened prior to commercial use with EPON 8021.

Equivalent weight based on reaction with amine-active hydrogen 150. The extremely low viscosity of EPON 8021 permits higher filler loadings, eliminates the need for reactive diluents, and provides for suitable working characteristics at lower application temperatures than conventional epoxy resins. Figure 1 plots the viscosity of this resin at various temperatures.

Figure 1/ Resin viscosity at various temperatures

EPON Resin 8021

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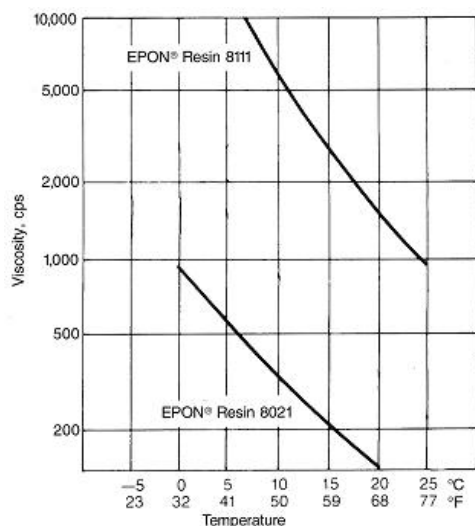
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EPON 8021 was designed to be cured with aliphatic amines. Suitable curing agents for use with this resin include EPI-CURE™ 3282 and 3271 Curing Agents as well as the unmodified polyethylene amines, such as triethylenetetramine. For optimum property development, the preferred combining ratio is calculated on the basis of one amine-active hydrogen equivalent per 150 parts by weight EPON 8021.

Polyamide curing agents, amidoamine curing agents, aromatic amine curing agents, mercaptans, and anhydrides can also be used to cure EPON 8021. However, generally soft, low strength thermosets are obtained when using these types of curing agents. Catalytic curing agents such as boron trifluoride complexes, dicyandiamide, and tertiary amines are not recommended for use with EPON 8021.

When cast in thin films, systems based on EPON Resin 8021/aliphatic amine curing agent combinations form smooth, continuous coatings free of cratering, crawling and residual surface tackiness. Such systems are less prone to form "sweat-out" when applied in thin film than are similar systems based on conventional bisphenol A based epoxy resins. Epoxy compounds based on EPON 8021 possess unusually low exotherm temperatures for their reactivity class. This combination of high reactivity and moderate exotherm suggests the use of this resin in splicing and sealing compounds.

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.

EPON Resin 8021 should be stored in tightly sealed glass, stainless steel or phenolic-lined containers at normal room temperatures. Storage in unlined steel containers should be avoided. Care should be taken to avoid storage temperatures above 50 °C. EPON 8021 should not be stored below 0 °C, since this will result in acute resin crystallization. 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, please contact customer service:

www.hexion.com/Contacts/

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

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