Technical Data Sheet

EPON™ Resin 863

Product Description

EPON Resin 863 is a low viscosity, undiluted, difunctional epoxy resin produced from bisphenol-F (BPF) and epichlorohydrin and was specially developed to provide good resistance to crystallization. When cross-linked or hardened with appropriate curing agents, very good mechanical, adhesive, chemical and electrical properties are obtained.

Application Areas/Suggested Uses

- Solventless or high solids/low VOC maintenance and marine coatings
- Chemical resistant tank linings, floorings, and grouts
- Fiber reinforced pipes, tanks, and composites
- Tooling, casting, and molding compounds
- Construction, electrical, and aerospace adhesives

Benefits

- Low viscosity
- Low color
- Improved crystallization resistance relative to EPON Resin 862 and diluted BPA epoxy resins
- Can be blended with EPON Resin 828 and other epoxy resins
- Reacts with a full range of epoxy curatives
- Good balance of mechanical, adhesive, and electrical properties
- Good chemical resistance

Sales Specifications

Property	Value	Unit	Test Method
Color	200 max.	Pt-Co	ASTM D1209
Viscosity at 25°C	25 - 45	P	ASTM D445
Weight per Epoxide	165 - 174	g/eq	ASTM D1652

Typical Properties

Property	Value	Unit	Test Method
Density at 25°C	9.9	lb/gal	ASTM D1475

Processing/How to use

General Information

Difunctional BPF epoxy resins, such as EPON Resin 862 and EPON Resin 863, are generally easier to process than their BPA epoxy counterparts largely due to the lower resin viscosity (summarized in Table 1). The lower resin viscosity permits the use of higher filler levels and makes it easier to incorporate fillers into formulations. For solvent-based systems, the lower resin viscosity allows for higher solids levels and lower VOC for the same formulated viscosity. BPF epoxy resins can also be blended with EPON Resin 828 and other epoxy resins or HELOXY modifiers to lower the viscosity for ease of formulating and improved processing.

Table 1 / Property Comparison for Liquid Epoxy Resins

Property	EPON Resin 826	EPON Resin 828	EPON Resin 862	EPON Resin 863
Viscosity at 25°C, Poise[1]	65 - 95	110 - 150	25 - 45	25 - 45
Weight per Epoxide, g/eq	178 - 186	185 - 192	165 - 173	165 - 174
Crystallization Resistance	Fair	Good	Poor	Good

[1] ASTM D445

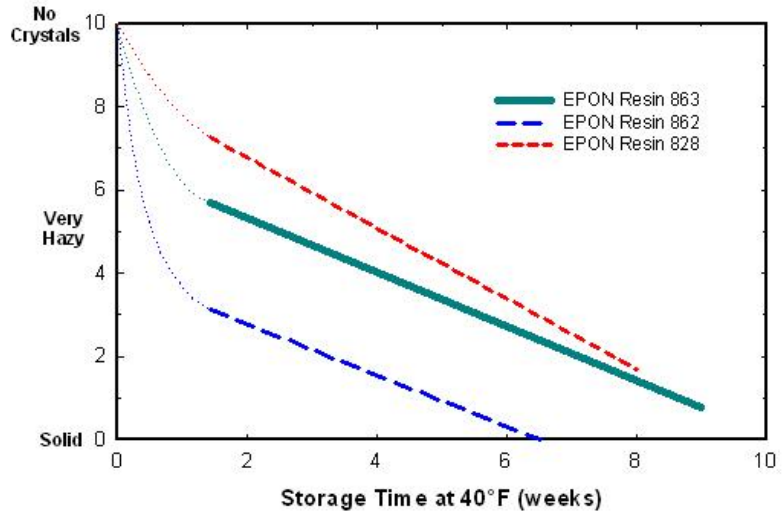
EPON Resin 863 offers improved crystallization resistance relative to many BPF epoxy resins, including EPON Resin 862. When stored for 6 months at 40°F, EPON Resin 863 remains clear and free of haze, while EPON Resin 862 crystallizes. EPON Resin 863 is also more crystallization resistant than diluted BPA-epoxy resins. The improved crystallization resistance of EPON Resin 863 relative to other liquid epoxy resins is demonstrated by Figure 1 for highly accelerated test conditions.

When appropriately cured, BPF epoxy resins provide comparable mechanical, chemical, and electrical properties to those of BPA epoxy-based systems, and significantly improved properties to those of diluted BPA epoxy resin systems. The handling and cured state properties for EPON Resin 863 formulated with a range of typical curing agents are listed in Table 2.

For more information about BPF epoxy resins, please refer to the following technical bulletins:

- EPON Resin 862
- Crystallization Resistance of Liquid DGEBPA and DGEBPF Epoxy Resins
- Chemical Resistance Guide

Figure 1 / Crystallinity Rating of Epoxy Resins Under Accelerated Testing[1]



[1] HEXION test method SMS 2018 (diluted to 6 Poise and seeded with epoxy crystals)

Performance Properties

Table 2 / Physical Properties of EPON Resin 863 Cured with a Variety of Curing Agents

	Method	Units	A	B	C	D
EPON Resin 863		pbw	100	100	100	100
Triethylenetetramine (TETA)[1]		pbw	15.4			
Polyetheramine D-230[2]		pbw		35.2		

	Method	Units	A	B	C	D
Amidoamine curing agent[3]		pbw			38.5	
Aromatic amine curing agent[4]		pbw				26.2
Handling Properties						
Viscosity @ 25°C		cP	775	300	2340	2200
Gel Time @ 33°C, 100 g	Shyodu	minutes	25	360	35	---
Cure Schedule		hrs/°C	24 / 25	24 / 25	24 / 25	1 / 80
Post Cure		hrs/°C	1 / 121	1 / 121	1 / 121	1 / 121 2 / 177
Cured State Properties[2]						
Tg by Rheometrics (tan-delta)[5]	ASTM D3418	°C	121	80	90	150
Heat Deflection Temperature[6]	ASTM D648	°C	107	71	65	130
Tensile Strength[7]	ASTM D638	psi	12,000	8,400	8,400	11,800
Tensile Elongation		%	7.5	6.2	5.9	10.6
Tensile Modulus		ksi	470	470	410	420
Flexural Strength[8]	ASTM D790	psi	18,500	17,600	13,500	---
Flexural Modulus		ksi	500	500	410	---
Fracture Toughness[9]	ASTM E399	psi-in$^{1/2}$	1,010	750	1,460	570
Chemical Resistance[10]						
Water at 49°C (120°F)		%	0.85	1.26	1.23	0.91

	Method	Units	A	B	C	D
IPA/Xylene (50/50) at 25°C		%	0.33	2.77	1.00	0.02
25% Sulfuric Acid at 25°C		%	0.78	2.38	0.72	0.23
5% Sodium Hydroxide at 25°C		%	0.22	0.32	0.28	0.29

[1] EPIKURE Curing Agent 3234	[2] EPIKURE Curing Agent 9550
[3] EPIKURE Curing Agent 3072	[4] EPIKURE Curing Agent W
[5] ASTM D4065 (Dynamic Mechanical Properties of Plastics)	[6] ASTM D648 (Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position)
[7] ASTM D638 (Tensile Properties of Plastics). Tensile values reported at sample break.	[8] ASTM D790 (Flexural Properties of Unreinforced and Reinforced Plastics)
[9] ASTM E399 (Plane-Strain Fracture Toughness)	[10] Percent weight gain after immersion for 7 days

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 863 should be stored in tightly sealed containers of metal, glass, or polyolefin plastic at normal room temperatures. If EPON Resin 863 develops haziness or crystallizes during storage, it can be restored to its original condition by gently warming the container and its contents to approximately 140-150°F until all visual evidence of crystallization is gone. Upon cooling to normal ambient temperature conditions, the product will regain its original liquid state physical properties. This process can be repeated as necessary.

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 atwww.hexion.com