

Technical Data Sheet

Re-issued August 2001

EPON™ Resin 1123-A-80

Product Description

EPON™ Resin 1123-A-80 is a brominated bisphenol A epoxy resin supplied as an 80% solids by weight solution in acetone. This resin produces flame retardant polymers that have many of the attractive properties obtained with conventional EPON BPA epoxy resins. Although particularly useful for the manufacture of rigid and multilayer FR-4 prepregs and laminates for printed circuit boards, this resin may also be used for molding compounds, surface coatings, and other epoxy end uses where flame retardant properties are desired. The flame retardancy of EPON Resin 1123-A-80 can be further improved by addition of a synergistic flame retardant, such as antimony oxide. The chemical and thermal performance of EPON Resin 1123-A-80 may be enhanced by blending with higher functionality resins such as EPON Resin 1031 and EPON Resin 164.

EPON Resin 1123-A-80 is manufactured to a tight range of product specifications and is distinguished by its low color, moderate viscosity, and cleanliness. Typical properties of EPON Resin 1123-A-80 are provided below. It must be emphasized that these values are typical of current production and are not to be construed as sales specifications.

The typical variation of viscosity and specific gravity with temperature for EPON Resin 1123-A-80 is provided in Figure 1.

Sales Specification

Property	Units	Value	Test Method/Standard
Weight per Epoxide	g/eq	415 – 435	ASTM D1652
Viscosity at 25°C	P	7 – 15	ASTM D1545
Color	Gardner	2 max.	ASTM D1544
Solids	% wt.	79 – 81	
Bromine Content	% wt.	18.0 – 20.5	Calculated

Typical Properties

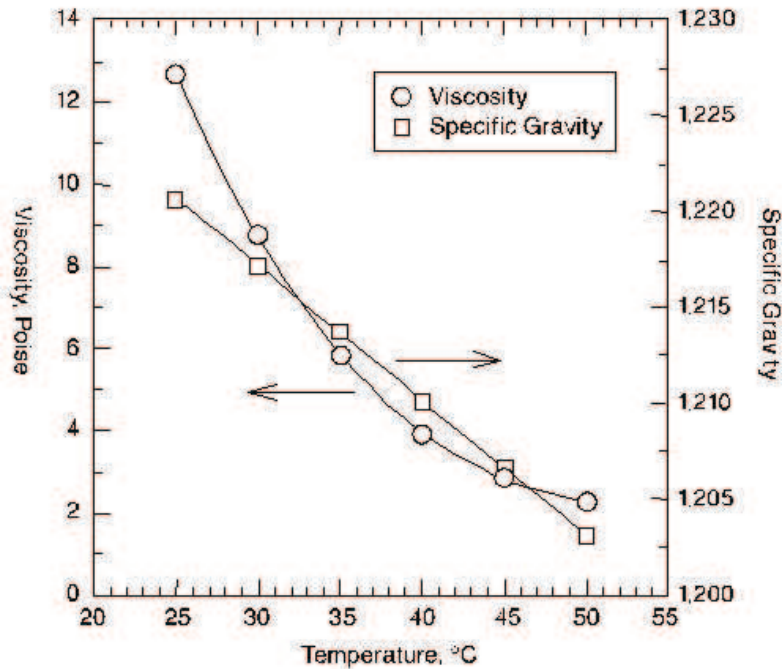
Property	Units	Value	Test Method/Standard
Solution Viscosity at 25°C	P	12	ASTM D1545
Specific Gravity	g/cc	1.22	
Density at 25°C	lb/gal	10.18	ASTM D1475

Appearance		Low color, viscous liquid	
------------	--	---------------------------	--

Processing/How to use

General Information

Figure 1 / Variation of viscosity and specific gravity with temperature for EPON™ Resin 1123-A-80



Varnish preparation

EPON Resin 1123-A-80 is typically converted to a laminating varnish by adding the desired quantity of Dicyandiamide (Dicy) curing agent, additional solvents for Dicy dissolution and viscosity control, and an accelerator. Imidazoles, especially 2-methylimidazole (2-MI) (Catalyst 1202) and 2-phenylimidazole (2-PI), are the most common accelerators used with this resin, but tertiary amines (such as benzyldimethylamine) and other compounds can also be used. Relative to tertiary amines, imidazoles do not require an induction time following varnish preparation and provide increased laminate glass transition temperatures. As with most resin systems, it is important to understand that the accelerator level must be chosen so as to maintain a balance of processability and cured system properties. That is, sufficient accelerator should be used to drive the cure reaction to completion while not accelerating the reaction to such an extent as to negatively impact system processability. For EPON Resin 1123-A-80 cured with 2.7-3.0 phr Dicy, a typical 2-MI level is 0.05 to 0.20 parts per hundred of resin solids (phr), but the optimum level is best determined by lab studies and prepreg manufacturing history. Two examples of typical resin varnishes are provided in Table 1.

Prepreg and Laminate Performance

Varnish formulations prepared with EPON Resin 1123-A-80 may be processed into prepregs using common fiberglass cloth styles and finishes. In part due to the low resin viscosity,

Table 1/Typical varnish formulations

	Units	A	B
EPON Resin 1123-A-80	pbw	125	125
Dicyandiamide	pbw	2.7 – 3.0	3.0
Methyl cellosolve	pbw	45	---
n,n-Dimethylformamide	pbw	---	27
Acetone	pbw	5	20
2-Methylimidazole	pbw	0.05 – 0.20	0.1
Varnish Gel Time at 1717°C	seconds	---	200

Table 2 / Typical laminate properties ¹

	Units	Value
Tg by DSC, midpoint	°C	136
Tg by TMA	°C	137
Z-Axis CTE (at 50-250°C)	ppm/°C	180
T-260 time to delamination at 260°C	minutes	17
TGA 5% weight loss in air	°C	300
UL-94 flammability rating		V-O
Copper peel (1 oz. copper), before and after thermal stress	lb/in	8 - 11
Water absorption, after 24 hours at 23 °C	% wt.	0.10
Water absorption, after 60 min. with 15 psi steam	% wt.	0.40
Solder dip, 20 secs at 288 °C, after 60 min. with 15 psi steam		Pass (Value 5)
Methylene chloride absorption	% wt.	1.05
Permittivity at 23 °C and 1 MHz		4.5 – 4.6
Loss tangent at 23 °C and 1 MHz		0.019

¹ 8-ply, 7628 construction with 0.059 inch nominal thickness.Cure time of 60 minutes at 350 °F.

Prepreg and Laminate Performance (cont.)

systems prepared with EPON Resin 1123-A-80 exhibit excellent wetout of glass fabrics. Once B-staged to the desired level of advancement, prepregs prepared with EPON Resin 1123-A-80 provide very good flow control during prepreg lamination and press well with traditional FR-4 cure cycles.

A hold time of 60 minutes at 350 °F is typically sufficient to cure EPON Resin 1123-A-80 and provide the laminate properties listed in Table 2; however, optimization of cure conditions for individual situations is recommended to minimize press cycle time and maximize system performance.

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.

EPON Resin 1123-A-80 should be stored in cool, dry conditions, preferably in its shipping containers, to minimize solvent loss and product contamination.

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.

Packaging

Available in bulk and drum quantities.

Contact Information

For product prices, availability, or order placement, call our toll-free customer service number at: 1-877-859-2800

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

® and ™ Licensed trademarks of Momentive Specialty Chemicals Inc.

DISCLAIMER

The information provided herein was believed by Momentive Specialty Chemicals Inc. ("Momentive") to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. All products supplied by Momentive are subject to Momentive's terms and conditions of sale. **MOMENTIVE MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY MOMENTIVE**, except that the product shall conform to Momentive's specifications. Nothing contained herein constitutes an offer for the sale of any product.

PDS-4035- (Rev.11/17/2012 11:44:30 AM)