

Technical Data Sheet

EPON™ Resin 1124-A-80

Product Description

EPON™ Resin 1124-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 1124-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 1124-A-80 may be enhanced by blending with higher functionality resins such as EPON Resin 1031 and EPON Resin 164.

EPON Resin 1124-A-80 is manufactured to a tight range of product specifications and is distinguished by its low color and cleanliness. Relative to EPON Resin 1123-A-80, EPON Resin 1124-A-80 has a higher molecular weight and viscosity. This feature translates to improved flow control during prepreg lamination. In addition, the higher molecular weight for EPON Resin 1124-A-80 can also lead to increased treater productivity since less resin advancement is needed to achieve a given level of prepreg flow. Typical properties of EPON Resin 1124-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.

Sales Specifications

Property	Value	Unit	Test Method
Bromine	18 - 21	% wt.	
Color	2 max	Gardner	ASTMD1544
Solids	79 - 81	% wt.	
Viscosity at 25°C	12 - 20	P	ASTMD1545
Weight per Epoxide	425 - 445	g/eq	ASTMD1652

Typical Properties

Property	Value	Unit	Test Method
Appearance	Slightly amber, Viscous liquid		
Density at 25°C	10.18	lb/gal	ASTMD1475
Solution Viscosity	16	P	
Specific gravity	1.22		

Processing/How to use

General Information

Varnish Preparation

EPON Resin 1124-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

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<https://www.hexion.com/en-US/product/epon-resin-1124-a-80>

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the cure reaction to completion while not accelerating the reaction to such an extent as to negatively impact system processability. For EPON Resin 1124-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 varnish formulations are provided in Table 1.

Table 1 /Typical varnish formulations

	<u>Units</u>	<u>A</u>	<u>B</u>
EPON™ Resin 1124-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 @ 171 °C	seconds	---	175-180

Prepreg and Laminate Performance

Varnish formulations prepared with EPON Resin 1124-A-80 may be processed into prepregs using common fiberglass cloth styles and finishes. Once B-staged to the desired level of advancement, prepregs prepared with EPON Resin 1124-A-80 provide excellent 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 1124-A-80 with Dicy and provide laminates with excellent mechanical, thermal, chemical, and electrical properties, typical values of which are listed in Table 2. Optimization of cure conditions for individual situations is recommended to minimize press cycle time and maximize system performance.

Table 2 /Typical laminate properties ¹

	Units	Value
Tg by DSC, midpoint	°C	135
Tg by TMA	°C	134
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.	0.19
Water absorption, after 60 min. with 15 psi steam	% wt.	0.45
Solder dip, 20 secs at 288 °C, after 60 min. with 15 psi steam		Pass (Value 5)
Methylene chloride absorption	% wt.	1.09

¹ 8-ply, 7628 construction with 0.057 inch nominal thickness Cure time of 60 minutes at 350 °F.

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 1124-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 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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