

D.E.N. 431

Epoxy Novolac

Description

D.E.N.* 431 epoxy novolac resin is a semi-solid reaction product of epichlorohydrin and phenol-formaldehyde novolac.

Introduction

D.E.N. 431 epoxy novolac resin combines in one molecule the thermal stability of a phenolic backbone with the reactivity and versatility of an epoxy. D.E.N. 431 epoxy novolac resin has multi-epoxy functionality (± 2.8). These additional reactive sites, as compared to a bisphenol-A type epoxy resin, produce tightly cross-linked cured systems. This makes epoxy novolac resins especially useful in adhesives, electrical and structural laminates, coatings and castings for elevated temperature service. D.E.N. 431 epoxy novolac resin will exhibit chemical resistance and elevated temperature performance between the properties of D.E.N. 438 epoxy novolac resin and the bisphenol-A based liquid epoxy resins. Adhesives based on D.E.N. 431 epoxy novolac resins are ideal for use as binders for abrasives in grinding and polishing products. The low viscosity of D.E.N. 431 epoxy novolac resin makes it especially suited for electrical varnishes, filament-wound pipes and highly chemical resistant coatings for storage tanks.

Typical Applications

This product is suitable for use in applications such as:

- Adhesives
- Casting and Tooling
- Composites
- Can Coating
- Coil Coating
- Marine & Protective Coatings
- Photocure Industrial Coatings
- Potting and Encapsulation

Typical Properties¹

Epoxide Equivalent Weight, (g/eq)	172 - 179	ASTM D-1652
Viscosity @ 51.7°C, (mPa.s)	1100 - 1700	ASTM D-445
Density (g/ml) @ 25°C	1.21 Nom.	ASTM D-1963
Hydrolyzable Chloride Content (ppm)	1500 Max.	RPM 105-D
Color, Platinum Cobalt	250 Max.	ASTM D-1209
Volatiles, (wt. %)	0.5 Max.	ASTM E-203
Flash Point (°C)	218	ASTM D-93
Shelf Life, (Months)	24	

¹ Typical properties; not to be construed as specifications

Safety and Handling

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS on its products and other materials prior to their use. For further handling information consult the Dow brochure entitled, *DOW Epoxy Resins Product Stewardship Manual, Safe Handling and Storage*, Form No. 296-00312-898.

Product Stewardship

The Dow Chemical Company has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis of our Product Stewardship philosophy by which we assess the health and environmental information on our products and then take the appropriate steps to protect employee and public health and the environment. The Dow Chemical Company has enduring commitments to Responsible Care® in the management of chemicals worldwide. Our Product Stewardship program rests with every individual involved with Dow products from the initial concept and research to the manufacture, sale, distribution, and disposal of each product.

Customer Notice

Dow encourages its customers and potential users of Dow products to review their applications for such products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they were not intended or tested, Dow personnel are available to assist customers in dealing with ecological and product safety considerations.

Your Dow sales representative can arrange for the proper contacts. Dow literature, including Material Safety Data Sheets should be consulted prior to the use of Dow products.

Food Contact Statement

When properly formulated and cured for food contact applications, this resin will comply with the U.S. Food, Drugs and Cosmetics Act as amended under Food Additive Regulation 21 CFR 175.300. This use is subject to good manufacturing practices and limitations specified in each regulation, which should be consulted for complete details.

If your applications include food contact requirements, please contact your Dow representative for further information and forthcoming EC regulations. Also consult the Dow data

sheet, *Food Additive Status for Epoxy Resins, Curing Agents and Epoxy Novolac Resins*, Form No. 296-01425.

Regulatory Status

This semi-solid epoxy novolac resin is regarded as a polymer according to the 6th Amendment of Council Directive 67/548/EEC and as a substance according to Council Directive 92/32/EEC of 30 April 1992; the 7th Amendment of that same directive. The resin has been reported to the EC Commission as No-Longer Polymer (NLP), is registered under the NLP # 500-108-2, and is, therefore, exempt from the European Inventory of Existing Chemical Substances (EINECS). In addition, Dow confirms that the chemicals and intentional additives which form the basis of this product are listed on EINECS. With respect to China, please note that there is currently no formal Chinese Chemical Inventory legislation in place. The Chinese Authorities are in the process of draft-

Chemical Inventory List

CAS Number*		28064-14-4
Europe	EINECS	NLP#500-108-2
United States	TSCA	28064-14-4
Canada	DSL	28064-14-4
Australia	AICS	28064-14-4
Japan	MITI	7-2044
Korea	KECL	KE-28226
Philippines	PICCS	28064-14-4
China	Informal 1997 PRC Inventory	28064-14-4

* Please refer to the Material Safety Data Sheet (MSDS) or SDS for this product to ensure this CAS number is consistent with the product(s) you use.

ing such legislation. There is in place an "Informal 1997 PRC Chemical Inventory List" and the above mentioned CAS Reg. Nr. is listed on it.

For more information on the regulatory status of this product, please refer to the Material Safety Data Sheet (MSDS) or SDS for this product.

For additional information:

In the U.S. and Canada,
contact The Dow Customer Information Group at:
1-800-441-4369 or 989-832-1426
Fax: 989-832-1465

In Mexico,
Call 95-800-441-4369 (Toll Free) or
52-5-2014718 (Outside Mexico)

In Latin America,
contact The Dow Chemical Service Center at:
In Argentina, call 54 11 4390329
In Brazil, call 55 11 51889367

In the Pacific,
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*Toll Free from Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and The United Kingdom.

Visit our Web site at www.dowepoxy.com

Email address: <http://www.dow.com/assistance/thoughts.htm>

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Published October, 2001



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