

An Emerald Performance Materials Company

ERISYS™ RDGE

Resorcinol Diglycidyl Ether

Low Viscosity Aromatic Difunctional Epoxy Resin

CAS NO. 101-90-6

DESCRIPTION

ERISYS RDGE, epoxidized resorcinol, is a very low viscosity aromatic diepoxide. When properly formulated RDGE can be used as the sole resin in an epoxy formulation. Its primary use, however, is as a reactive modifier. All epoxy resin curing agents are compatible with RDGE and RDGE/epoxy resin blends. As a result of RDGE's high reactivity, formulators have increased latitude in curing agent selection.

Epoxy formulations modified with RDGE exhibit viscosity reduction, significantly faster cures and high cross-link densities. Higher cross-link density produces higher strengths, improved toughness, better heat resistance and better chemical resistance than formulations modified with other reactive diluents.

Property modification is concentration dependent. See the following table and graphs for an indication of the magnitude of the changes which can be expected.

Due to the purity of RDGE, crystallization of this resin can occur. The crystallized resin can be liquified without damage to the resin by opening the drum bung and heating to a temperature of 50°C to 60°C. Re-liquified resin should be mixed before sampling or partial use of drum. RDGE can be stored at 50°C to prevent re-crystallization, however, it is not recommended to store at 50°C for more than two weeks.

APPLICATIONS

- ☐ Conductive Adhesives
- ☐ Prepregs and Composites
- ☐ Chemical Resistant Coatings
- ☐ Viscosity Modifier for Epoxy Novolacs

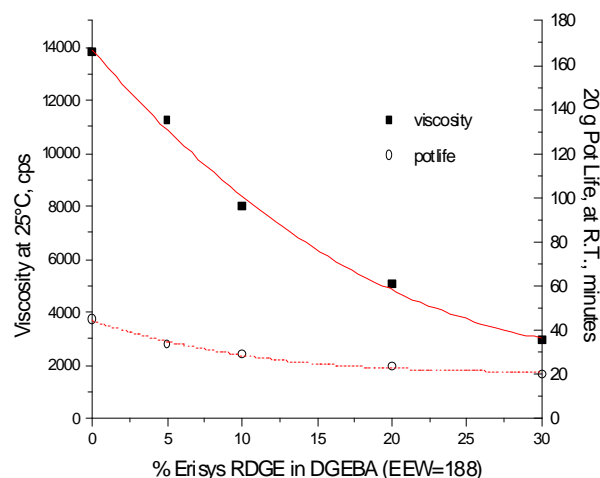
TYPICAL PROPERTIES

Appearance	Clear, Clean
Viscosity @ 25°C, cps	300 - 500
Epoxide Equivalent Weight, g/eq	118 - 125
Gardner Color, max	2
Residual Epichlorohydrin, max ppm	10
Hydrolyzable Chloride, max %	0.10
Weight per Gallon, @ 25°C, lbs.	10.0 ± 0.1
Flash Point, COC, °C (°F)	177 (350)

HANDLING PROPERTIES

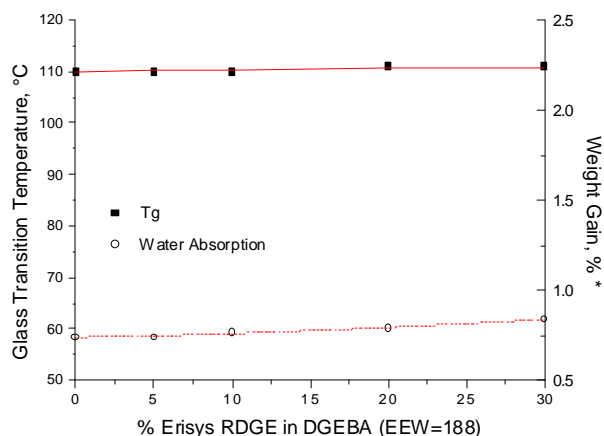
The use of ERISYS RDGE will effect the handling and cured properties of resin formulations. The effects of these changes are shown below.

VISCOSITY AND POT LIFE



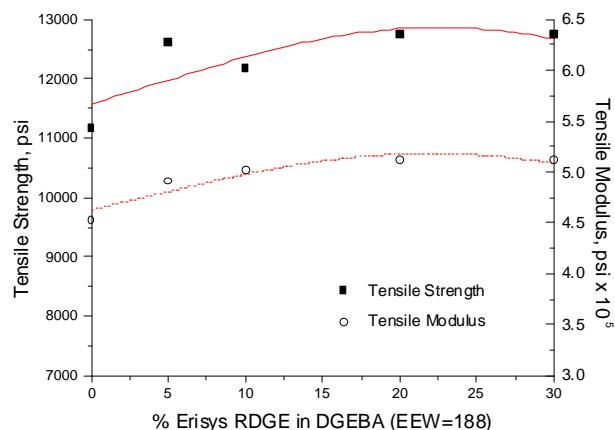
HANDLING PROPERTIES (Continued)

Tg and MOISTURE PICKUP



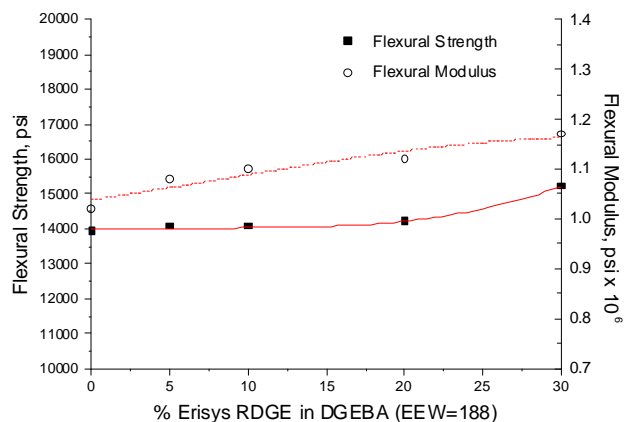
*After 2 hours in boiling water

TENSILE PROPERTIES

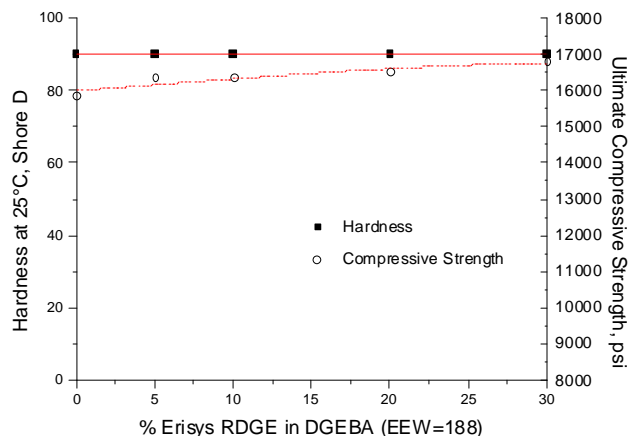


THE EFFECT OF ERISYS RDGE ON THE CURED PROPERTIES OF LIQUID EPOXY RESIN (EEW 188) CURED WITH TETA

FLEXURAL PROPERTIES



HARDNESS and COMPRESSIVE STRENGTH



PROPERTIES OF DGEBA/RDGE/TETA SYSTEMS

FORMULATION, pbw	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
DGEBA (EEW-188)	100.0	95.0	90.0	80.0	70.0
ERISYS RDGE	0	5.0	10.0	20.0	30.0
Triethylenetetramine	13.0	13.2	13.5	14.0	14.5

RESULTS
HANDLING PROPERTIES

Viscosity @ 25° C of resin					
portion only, cps	13,800	11,240	8,000	5,040	2,940
20 g Pot Life, hours:minutes	0:45	0:34	0:29	0:24	0:20

CURED PROPERTIES*
TENSILE

Strength, psi	11,165	12,615	12,180	12,760	12,760
MPa	77	87	84	88	88
Elongation, %	4.2	4.7	5.2	5.8	6.7
Modulus, psi	4.53E + 05	4.91E + 05	5.01E + 05	5.11E + 05	5.12E + 05
MPa	3,127	3,389	3,458	3,527	3,531

FLEXURAL

Strength, psi	13,920	14,065	14,065	14,210	15,225
MPa	96	97	97	98	105
Modulus, psi	1.02E + 06	1.08E + 06	1.10E + 06	1.12E + 06	1.17E + 06
Mpa	7,063	7,425	8,142	7,721	8,060

COMPRESSIVE

Strength at yield, psi	7,067	7,800	7,800	7,633	7,633
MPa	49	54	54	53	53
Ultimate strength, psi	15,833	16,367	16,350	16,500	16,800
MPa	109	113	113	114	116

HARDNESS @ 25°C,

D durometer	90	90	90	90	90
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GLASS TRANSITION TEMPERATURE,

° C	110	103	110	111	111
° F	230	230	230	232	232

**WATER ABSORPTION,
WEIGHT GAIN AFTER:**

28 Days in 25°C water, %	0.77	0.71	0.73	0.68	0.72
2 Hours in boiling water, %	0.74	0.74	0.77	0.79	0.84

*Cure: gel at R.T. + 2 hours at 100°C

HEALTH & SAFETY PRECAUTIONS

ERISYS RDGE is not a primary skin irritant and sensitizer. However, as with any epoxy material, irritation can result from repeated or prolonged contact. The symptoms of this irritation may appear as a mild reddening or a more pronounced rash. It is, therefore, important to avoid skin contact where possible. Rubber gloves, full eye protection, and protective clothing are recommended. In the event of contact treat as follows:

Skin Contact: Wash well with soap and water. Remove contaminated clothing and wash thoroughly before re-using. Leather shoes cannot be cleaned. It is recommended that resin not be removed from skin with solvents since solvents increase contact and encourage penetration. Moreover, solvents of themselves dry and crack the skin.

Eye contact: Flush immediately with large quantities of water. Contact a physician.

PACKAGING & AVAILABILITY

ERISYS RDGE is available in 55 gallon steel non-returnable drums (500 lbs. net) and 5 gallon plastic pails (45 lbs. net). Bulk deliveries are available on special request.

DISCLAIMER

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CVC Thermoset Specialties—844 N. Lenola Road/Moorestown, NJ 08057
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