CVC Thermoset Specialties

An Emerald Performance Materials Company

TECHNICAL BULLETIN

ERISYS™ GE-22

1,4 Cyclohexanedimethanol Diglycidyl Ether
Cycloaliphatic Difunctional Epoxy
Reactive Diluent
CAS N0. 14228-73-0

DESCRIPTION

ERISYS GE-22, epoxidized cyclohexanedimethanol, is a low viscosity, cycloaliphatic diepoxide. It is intended for use as a reactive diluent for high viscosity epoxy resins. GE-22 is compatible at all concentrations with those resins and resin/ diluent blends can be cured using any epoxy resin curing agent.

As a result of its chemical structure, GE-22 is not as efficient in viscosity reduction as the aliphatic monofunctional reactive diluents ERISYS GE-5, GE-6, GE-7, and GE-8. However, the performance properties of epoxy formulations diluted with GE-22 are modified to a lesser degree than those systems containing the aliphatic monofunctional diluents. Depending on concentration, properties such as gel time, strength, and modulus of a GE-22 diluted formulation remain relatively unchanged compared to an undiluted mix (see table and graphs below). The difunctionality of GE-22 helps to produce formulations with improved chemical and heat resistance compared to formulations containing monofunctional diluents. The cycloaliphatic nature of GE-22 suggest its use in formulations requiring outdoor weathering resistance. Formulations containing ERISYS GE-22 exhibit outstanding creep resistance making them ideal for high performance grouts and structural applications. GE-22 improves a formulation's wettability. This diluent does not effect the pot life of precatalyzed epoxy resin/acid anhydride formulations.

APPLICATIONS

- ❑ Tooling System
- ❑ High Solids Coatings
- ❑ High Performance Epoxy Grouts
- ❑ Electrical and Electronic Adhesives/ Encapsulants
- ❑ Structural Adhesives

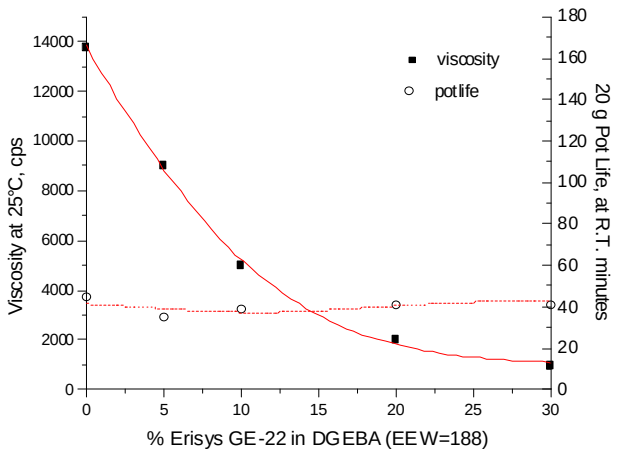
TYPICAL PROPERTIES

Appearance	Clear, Clean
Viscosity @ 25°C, cps	45 – 75
Epoxide Equivalent Weight, g/eq	145 – 165
APHA Color, max	100
Residual Epichlorohydrin, max ppm	10
Hydrolyzable Chloride, max %	0.10
Weight per Gallon, @ 25°C, lbs.	9.2 ± 0.1
Flash Point, °C (°F)	>110(>230)

HANDLING PROPERTIES

The use of ERISYS GE-22 will effect the handling and cured properties of resin formulations. The effects of these changes are shown below.

VISCOSITY AND POT LIFE



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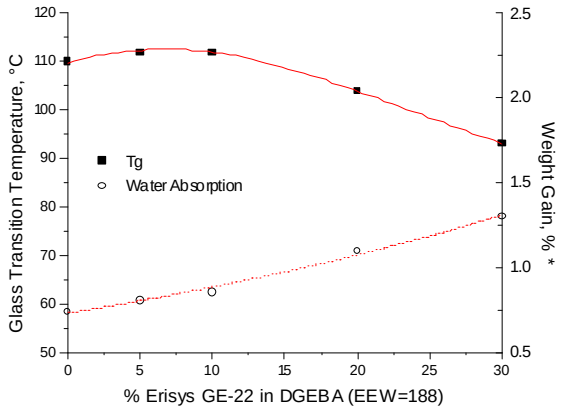
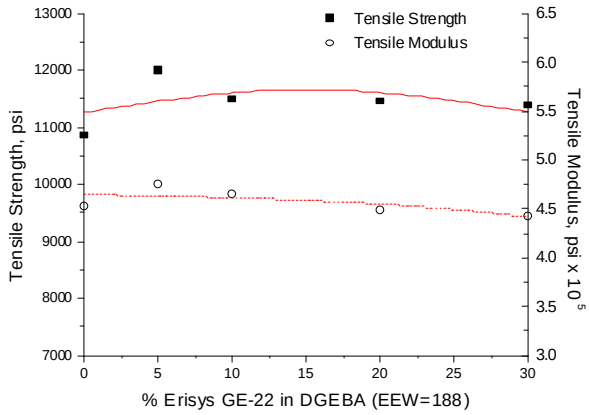
HANDLING PROPERTIES (Continued)

Tg and MOISTURE PICKUP



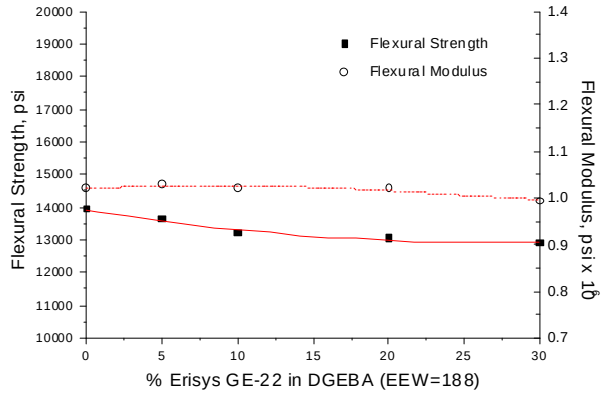
TENSILE PROPERTIES



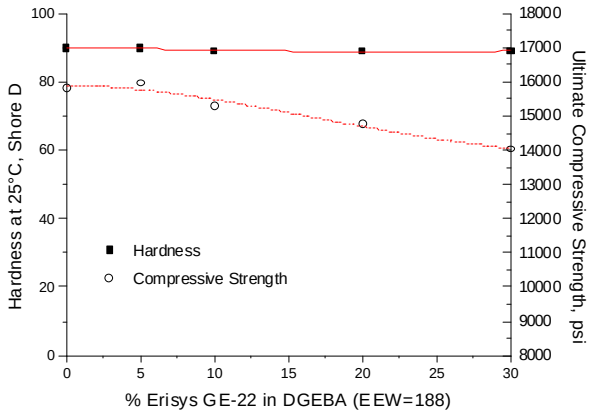
*After 2 hours in boiling water

THE EFFECT OF ERISYS GE-22 ON THE CURED PROPERTIES OF LIQUID EPOXY RESIN (EEW 188) CURED WITH TETA

FLEXURAL PROPERTIES



HARDNESS and COMPRESSIVE STRENGTH



PROPERTIES OF DGEBA/GE-22/TETA SYSTEMS

FORMULATION, pbw	A	B	C	D	E
DGEBA (EEW-188)	100.0	95.0	90.0	80.0	70.0
ERISYS GE-22	0	5.0	10.0	20.0	30.0
Triethylenetetramine	13.0	13.1	13.2	13.4	13.7
RESULTS					
HANDLING PROPERTIES					
Viscosity @ 25° C of resin					
portion only, cps	13,800	9,060	5,020	2,056	980
20 g Pot Life, minutes	0:45	0:35	0:39	0:41	0:41
CURED PROPERTIES*					
TENSILE					
Strength, psi	10,875	12,000	11,500	11,455	11,400
MPa	77	87	79	79	79
Elongation, %	4.2	4.7	4.8	6.9	7.1
Modulus, psi	4.53E + 05	4.76E + 05	4.65E + 05	4.49E + 05	4.43E + 05
MPa	3,127	3,283	3,206	3,099	3,055
FLEXURAL					
Strength, psi	13,920	13,630	13,195	13,050	12,905
MPa	96	94	91	90	89
Modulus, psi	1.02E + 06	1.03E + 06	1.02E + 06	1.02E+06	9.93E + 05
MPa	7,063	7,120	7,052	7,053	6,849
COMPRESSIVE					
Strength at yield, psi	7,067	6,900	7,050	6,767	6,600
MPa	49	48	49	47	46
Ultimate strength, psi	15,833	15,967	15,300	14,767	14,033
MPa	109	110	106	102	97
HARDNESS @ 25°C,					
D durometer	90	90	89	89	89
GLASS TRANSITION TEMPERATURE,					
° C	110	112	112	104	93
° F	230	234	234	219	199
WATER ABSORPTION, WEIGHT GAIN AFTER:					
28 Days in 25°C water, %	0.77	0.75	0.81	0.88	0.99
2 Hours in boiling water, %	0.74	0.81	0.85	1.1	1.3

*Cure: gel at R.T. + 2 hours at 100°C

HEALTH & SAFETY PRECAUTIONS

ERISYS GE-22 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.

Refer to the **CVC Thermoset Specialties** Material Safety Data Sheet on ERISYS GE-22 for additional safety & handling information. The MSDS is revised as new data becomes available.

PACKAGING & AVAILABILITY

ERISYS GE-22 is available in 55 gallon steel non-returnable drums (480 lbs. net) and 5 gallon plastic pails (45 lbs. net). Bulk deliveries are available on special request.

DISCLAIMER

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