

Cardolite® LITE 2401

Epoxy Curing Agent

Composite & Adhesive Applications

DESCRIPTION

Cardolite LITE 2401 is a solvent-free, very low viscosity phenalkamine curing agent designed for ambient and medium temperature cure with liquid epoxy resins and epoxy based fiber reinforced composites. It is specifically designed to have a low odor, very good fiber wetting and to be applicable in a variety of different production processes. LITE 2401 is characterized by long pot life, good resistance to water, alkali and acid solutions.

PROPERTIES

PROPERTY	TYPICAL VALUE	TEST METHOD
Color (Gardner)	≤ 8	ASTM D1544
Viscosity @ 25°C (cPs)	90	ASTM D2196
Amine Value (mg KOH/g)	496	ASTM D2074
Density @ 25°C (kg/L) (lbs/gal)	0.94 - 0.96 7.84 - 8.01	ASTM D1475

PROPERTY	TYPICAL VALUE	TEST METHOD
Appearance	Light Yellow Liquid	Visual
Theoretical Active Hydrogen Equivalent (AHEW) ¹	61	Calculated
Flash Point	> 110°C / 230°F	ASTM D93
Recommended Use Level (phr, EEW 190)	32	-

Typical properties are not to be construed as specifications

¹ Based on total product weight

APPLICATIONS

- Composites based on epoxy chemistry
- Vacuum assisted composite processing
- Resin Transfer Molding
- Wet Lay Up and Lamination
- Composite Adhesives

ADVANTAGES

- Good processability
- Good chemical resistance
- Long Pot Life
- High Tg
- Compatible with most epoxy resins, diluents and their blends
- Non-critical mix ratio
- Based from natural, renewable, non-food chain raw material feedstock

TYPICAL HANDLING PROPERTIES

PROPERTIES	TYPICAL VALUE	TEST METHOD
Use Level with Liquid Epoxy Resin (pbw, EEW 190)	32	-
Mix viscosity @ 25°C (cPs)	2,583	ASTM D2196
Mix viscosity @ 40°C (cPs)	635	ASTM D2196
Pot Life, 100 g mix @ 25°C (min)	90	Internal Method ¹
Pot Life, 100 g mix @ 40°C (min)	44	Internal Method ¹

¹Pot Life is measured when the formulation reaches a limit viscosity of 10,000 cps at the reference temperature.

TYPICAL PERFORMANCE PROPERTIES

PROPERTIES	TYPICAL VALUE ¹	TEST METHOD
Glass transition temperature (°C) ²	126	ASTM 3418-99
Tensile strength (MPa)	71	ASTM D638-10
Tensile modulus (MPa)	2,450	ASTM D638-10
Tensile elongation (%)	4.2	ASTM D638-10
Flexural strength (MPa)	112	ISO 178
Flexural modulus (MPa)	2,628	ISO 178

¹Curing schedule: 4h@RT + 2h@100°C, Base resin: Liquid epoxy (EEW=190) ²DSC scan from 0 to 200°C, 2nd run

CHEMICAL RESISTANCE

CHEMICAL IMMERSION @ 25°C ASTM D543	FORMULATION A			FORMULATION B		
Use Level with Liquid Epoxy Resin (pbw, EEW 190)	100			100		
Cardolite LITE 2401	32			-		
JEFFAMINE® D-230 Polyetheramine	-			31		
CHEMICALS	FORMULATION A (WEIGHT INCREASE %)			FORMULATION B (WEIGHT INCREASE %)		
Time elapsed	3 days	7 days	14 days	3 days	7 days	14 days
Deionized water	0.32	0.45	0.65	0.37	0.49	0.66
10% sodium hydroxide	0.31	0.40	0.59	0.32	0.48	0.71
3% sulfuric acid	0.51	0.67	0.93	2.77	3.83	5.15
Acetone	4.91	7.76	12.74	Damaged	-	-
Toluene	0.06	0.07	0.09	4.82	7.70	11.63

STARTING FORMULATIONS AND PROCESSES

INGREDIENTS	HAND LAY-UP LAMINATION		VACUUM ASSISTED PROCESS		RESIN TRANSFER MOLDING
EC 157 ¹ (pbw)	90	-	90	100	-
Epon 828 ² (pbw)	-	90	-	-	90
Ultralite 513 ³ (pbw)	10	10	10	-	10
LITE 2401 (pbw)	33	31	33	34	31
PROPERTIES					
Viscosity @ 25°C (cps)	280	950	280	330	950
Pot Life @ 25°C (min)	180	95	180	135	95
Gel Time @ 25°C (min)	330	140	330	270	140
Tg (°C)	79	110	79	93	110

¹Low viscosity epoxy resin (EEW = 178) ²Liquid Epoxy Resin (EEW = 190) ³Cardanol-based epoxy reactive diluent (EEW = 383)

REGULATORY STATUS

Please refer to the material safety data sheet (MSDS). Specific information regarding chemical inventory listing can be obtained from your local sales representative.

SAFETY PRECAUTIONS

Please refer to the material safety data sheet (MSDS). Copies of the MSDS can be requested on the Cardolite website or via your local sales representative.

STABILITY AND STORAGE

Cardolite products may absorb moisture and carbon dioxide when left in open containers, which could result in increased viscosity, discoloration, reduction of reactivity, and/or crystallization of the products. These products should be kept tightly sealed in their original containers when not in use, and stored in a cool, dry place.

CONTACT INFORMATION



<http://www.cardolite.com>

Cardolite Corporation
140 Wharton Road
Bristol, PA 19007
United States of America

Cardolite Specialty
Chemicals Europe NV
Wijmenstraat 21K / 2
B-9030 Mariakerke (Gent)
Belgium

Cardolite Specialty Chemicals
India LLP
Plot No. IP-1 & IP-2, Mangalore
Special Economic Zone
Bajpe, Mangalore 574 142
India

Cardolite Chemical
Zhuhai Ltd.
1248 Ninth Shihua Road
Gaolan Port Economic Zone
Zhuhai, Guangdong 519050
P.R. China

T: +1-800-322-7365

T: +32 (0) 92658826

T: + 91 (0) 824 2888 300

T: +86-756-726-9066

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