HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® LY 556* / Hardener XB 3473*

HOT CURING EPOXY SYSTEM

Araldite® LY 556 is an epoxy resin
Hardener XB 3473 is a formulated amine hardener

APPLICATIONS

- Industrial composites
- Structural composites

PROPERTIES

Laminating system

PROCESSING

- Filament Winding
- Resin Transfer Moulding (RTM)
- Pressure Moulding
- Pultrusion

KEY DATA

Araldite® LY 556		
Aspect (visual)	clear, pale yellow liquid	
Colour (Gardner, ISO 4630)	≤ 2	
Viscosity at 25 °C (ISO 12058-1)	10000 - 12000	[mPa s]
Density at 25 °C (ISO 1675)	1.15 - 1.2	[g/cm^3]
Flash point (ISO 2719)	> 200	[°C]
Storage temperature (see expiry date on original container)	2 - 40	[°C]

Hardener XB 3473		
Aspect (visual)	clear yellow to brown liquid	
Viscosity at 25 °C (ISO 12058-1)	95 - 145	[mPa s]
Density at 25 °C (ISO 1675)	0.99 - 1.02	[g/cm^3]
Flash point (ISO 2719)	121	[°C]
Storage temperature (see expiry date on original container)	2 - 40	[°C]

STORAGE

Provided that Araldite® LY 556 and Hardener XB 3473 are stored in a dry place in their original, properly closed containers at the above mentioned storage temperatures they will have the shelf lives indicated on the labels.
Partly emptied containers should be closed immediately after use.

* *In addition to the brand name product denomination may show different appendices , which allows us to differentiate between our production sites: e.g , BD = Germany, US = United States, IN = India, CI = China, etc.. These appendices are in use on packaging, transport and invoicing documents. Generally the same specifications apply for all versions. Please address any additional need for clarification to the appropriate Huntsman contact.*

PROCESSING DATA

MIX RATIO

Components	*Parts by weight*	*Parts by volume*
Araldite® LY 556	100	100
Hardener XB 3473	23	27

We recommend that the components are weighed with an accurate balance to prevent mixing inaccuracies which can affect the properties of the matrix system. The components should be mixed thoroughly to ensure homogeneity. It is important that the side and the bottom of the vessel are incorporated into the mixing process.

When processing large quantities of mixture the pot life will decrease due to exothermic reaction. It is advisable to divide large mixes into several smaller containers.

INITIAL MIX VISCOSITY
(CONE/PLATE VISCOSIMETER)

	[*°C*]	[*mPa s*]
LY 556/XB 3473	at 25	5200 - 6000
	at 40	700 - 900

POT LIFE
(TECAM, 23°C, 65 % RH)

	[*g*]	[*h*]
LY 556/XB 3473	100	32 - 37

GEL TIME
(HOT PLATE)

	[*°C*]	[*min*]
LY 556/XB 3473	at 120	68 - 78
	at 140	35 - 43
	at 160	18 - 23
	at 180	9 - 13

The values shown are for small amounts of pure resin/hardener mix. In composite structures the gel time can differ significantly from the given values depending on the fibre content and the laminate thickness.

PROPERTIES OF THE CURED, NEAT FORMULATION

GLASS TRANSITION TEMPERATURE (IEC 1006, DSC, 10 K/MIN)	*Cure:*	T_G	*LY 556 XB 3473*
	4 h 80°C + 4 h 160°C	[°C]	162 - 168
	2 h 120°C + 4 h 180°C	[°C]	185 - 194
	2 h 120°C + 2 h 160°C + 2h 200°C	[°C]	185 - 193
	2 h 120°C + 2 h 160°C + 2h 200°C + 4h 220°C	[°C]	187 - 195
GLASS TRANSITION TEMPERATURE (ISO 6721, DMA, 2 K/MIN)	*Cure:*	T_G	*LY 556 XB 3473*
	2 h 120°C + 2 h 140°C + 2h 180°C	[°C]	175 - 185
FLEXURAL TEST (ISO 178)	*Cure:* 2 h 120°C + 2 h 140°C + 2 h 180°C		
	Flexural strength	[MPa]	110 - 120
	Elongation at flexural strength	[%]	5,5 - 6,5
	Ultimate strength	[MPa]	110 - 120
	Ultimate elongation	[%]	5,5 - 6,5
	Flexural modulus	[MPa]	2700 - 2900
FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	*Cure:* 2 h 120°C + 2 h 140°C + 2 h 180°C		
	Fracture toughness K_{1C}	[MPa√m]	0,70 - 0,85
	Fracture energy G_{1C}	[J/m^2]	190 - 220

PROPERTIES OF THE CURED, REINFORCED FORMULATION

Short beam: Laminate comprising 12 layers unidirectional E-glass fabric (425 g/m^2)
Laminate thickness t = 3.1 - 3.3 mm
Fibre volume content: 63 - 65 %

INTERLAMINAR SHEAR STRENGTH (ASTM D 2344)	*Cure:* 2 h 120 °C + 2 h 140 °C + 2 h 180 °C		
	Shear strength	[MPa]	62 - 66
FLEXURAL TEST (ISO 178)	*Cure:* 2 h 120 °C + 2 h 140 °C + 2 h 180 °C		
	Flexural strength	[MPa]	1050 - 1250
	Ultimate elongation	[%]	2.4 - 2.8
	Flexural modulus	[MPa]	40000 - 44000

HANDLING PRECAUTIONS

Personal hygiene	
Safety precautions at workplace	
protective clothing	yes
gloves	essential
arm protectors	recommended when skin contact likely
goggles/safety glasses	yes
Skin protection	
before starting work	Apply barrier cream to exposed skin
after washing	Apply barrier or nourishing cream
Cleansing of contaminated skin	
	Dab off with absorbent paper, wash with warm water and alkali-free soap, then dry with disposable towels. Do not use solvents
Disposal of spillage	
	Soak up with sawdust or cotton waste and deposit in plastic-lined bin
Ventilation	
of workshop	Renew air 3 to 5 times an hour
of workplaces	Exhaust fans. Operatives should avoid inhaling vapours

FIRST AID

Contamination of the *eyes* by resin, hardener or mix should be treated immediately by flushing with clean, running water for 10 to 15 minutes. A doctor should then be consulted.

Material smeared or splashed on the *skin* should be dabbed off, and the contaminated area then washed and treated with a cleansing cream (see above). A doctor should be consulted in the event of severe irritation or burns. Contaminated clothing should be changed immediately.

Anyone taken ill after *inhaling* vapours should be moved out of doors immediately.

In all cases of doubt call for medical assistance.

of the user to evaluate the manufacturing circumstances and the final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Advanced Materials containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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