

Advanced Materials
Technical Data Sheet**Araldite[®] LY 3598* / Aradur[®] 3498*****WARM CURING EPOXY SYSTEM**

Araldite[®] LY 3598 is a modified nano-toughened epoxy based resin
Aradur[®] 3498 is a formulated amine hardener

APPLICATIONS	• High performance sports applications • Industrial composites		
PROPERTIES	• Laminating system containing nano-technology, offering outstanding toughness. • Low viscosity to enable closed mould processing such as RTM and vacuum infusion		
PROCESSING	• Resin Transfer Moulding (RTM) • Vacuum infusion		
KEY DATA	Araldite[®] LY 3598		
	Aspect (visual)	Liquid very slight yellow	
	Viscosity at 25 °C (ISO 3219)	1200 – 1800 **	[mPa s]
	Density at 25 °C (ISO 1675)	1.10 - 1.20	[g/cm ³]
	Epoxy value (ISO 3001)	5.70 – 6.00 **	[Eq/kg]
	Aradur[®] 3498		
	Aspect (visual)	Colourless liquid	
	Viscosity at 25 °C	5 - 20	[mPa s]
	Density at 25 °C (ISO 1675)	0.95 - 1.0	[g/cm ³]

*** Specified data are on a regular basis analysed. Data which is described in this document as 'typical' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.*

STORAGE Provided that Resin LY 3598, Aradur 3498 are stored in a dry place in their original, properly closed containers at the storage temperatures mentioned in the MSDS 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.

TYPICAL SYSTEM DATA

PROCESSING DATA

MIX RATIO	<i>Components</i>	<i>Parts by weight</i>	<i>Parts by volume</i>
	Araldite® LY 3598	100	100
	Aradur® 3498	21	25

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.

Alternatively, a mixing/ dosing machine may be usefully employed when using automated processing (e.g. RTM).

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)		<i>[°C]</i>	<i>[mPa s]</i>
	Araldite® LY 3598 / Aradur® 3498	at 25	400 - 900

POT LIFE (Tecam, 100 ml, 65 % RH)		<i>[°C]</i>	<i>[min]</i>
	Araldite® LY 3598 / Aradur® 3498	at 23	40 - 70

GEL TIME (Hot plate)		<i>[°C]</i>	<i>[min]</i>
	Araldite® LY 3598 / Aradur® 3498	at 70	14 - 18
		at 80	7 - 10
		at 90	4 - 6
		at 100	2 - 4

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 (T_G) (ISO 11357-2, 10 K/min)	Cure:	T_G [°C]
	1 day RT	51 - 57
	3 day RT	52 - 58
	12h 40°C	62 - 68
	1 day 40°C	64 - 70
	1h 70°C	77 - 83
	9h 70°C	86 - 92
	30 min 100°C	87 - 93

FLEXURAL TEST (ISO 178)	Cure	30 min 100 °C	9 h 70 °C
Flexural strength	[MPa]	100 - 110	100 - 110
Ultimate elongation	[%]	7.0 - 8.5	6.0 - 8.0
Flexural modulus	[MPa]	2600 - 2800	2500 - 2800

FRACTURE PROPERTIES BEND NOTCH TEST (ISO 13586)	Cure	30 min 100 °C	9 h 70 °C
Fracture toughness K_{IC}	[MPa√m]	1.7 - 1.9	1.6 - 1.8
Fracture energy G_{IC}	[J/m ²]	900 - 1100	800 - 1000

PROPERTIES OF THE CURED, REINFORCED FORMULATION

Samples: 12 layers of unidirectional E-glass fabric (425 g/m²)

Laminate thickness: 3.2 mm

Fibre volume content 59 – 63 %

FLEXURAL TEST (ISO 14125/98)	Cure	9 h 70 °C
Flexural strength	[MPa]	980 - 1050
Ultimate elongation	[%]	2.3 - 2.5
Flexural modulus	[MPa]	42500 - 43200

INTERLAMINAR SHEAR TEST (ISO 14130/97)	Cure	9 h 70 °C
Shear strength	[MPa]	49 - 52

**HANDLING
PRECAUTIONS**

Personal hygiene

Safety precautions at workplace

protective clothing	yes
gloves	essential
arm protectors	recommended when skin contact likely
<u>goggles/safety glasses</u>	<u>yes</u>

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.

Huntsman Advanced Materials

(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 12

www.huntsman.com/advanced_materials
Email: advanced_materials@huntsman.com



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