HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® LY 3297 / Aradur® 3298 / Aradur® 3299*

COLD CURING EPOXY SYSTEM

Araldite® LY 3297 (epoxy resin)
Aradur® 3298 (low reactivity formulated amine hardener)
Aradur® 3299 (high reactivity formulated amine hardener)

APPLICATIONS	Industrial composites		
PROPERTIES	Laminating system with low viscosity and high flexibility. The reactivity may easily be adjusted to demands through the combination of both hardeners.		
PROCESSING	• Wet lay-up • Resin Transfer Moulding (RTM) • Pressure moulding		
KEY DATA	**Araldite® LY 3297**		
	Aspect (visual)	clear liquid	
	Viscosity at 25 °C (ISO 12058-1B)	4000 - 5000	[mPa s]
	Density at 25 °C (ISO 1675)	1.0 - 1.1	[g/cm^3]
	Flash point (ISO 2719)	> 100	[°C]
	Storage temperature (see expiry date on original container)	2 - 40	[°C]
	Aradur® 3298		
	Aspect (visual)	clear colourless liquid	
	Viscosity at 25 °C (ISO 12058-1B)	30 - 60	[mPa s]
	Density at 25 °C (ISO 1675)	0.90 - 1.00	[g/cm^3]
	Flash point (ISO 2719)	> 100	[°C]
	Storage temperature (see expiry date on original container)	2 - 40	[°C]
	Aradur® 3299		
	Aspect (visual)	clear colourless liquid	
	Viscosity at 25 °C (ISO 12058-1B)	40 - 70	[mPa s]
	Density at 25 °C (ISO 1675)	0,90 - 1,0	[g/cm^3]
	Flash point (ISO 2719)	> 100	[°C]
	Storage temperature	2 - 40	[°C]
STORAGE	Provided that Araldite® LY 3297 and Aradur® 3298 or Aradur® 3299 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 all ows 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 3297	100	100
Aradur® 3298	40	44
Araldite® LY 3297	100	100
Aradur® 3299	40	44

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

(HOEPPLER, ISO 12058-1B)

	[°C]	[*mPa s*]
Araldite LY 3297 / Aradur 3298	at 25	320 - 380
Araldite LY 3297 / Aradur 3299	at 25	350 - 400

POT LIFE

(TECAM, 23 °C, 65 % RH)

	[*g*]	[*min*]
Araldite® LY 3297 / Aradur® 329	100	120 - 135
Araldite® LY 3297 / Aradur® 329	100	40 - 50

GEL TIME

(HOT PLATE)

	[°C]	[*min*]
Araldite® LY 3297 / Aradur® 3298	at 40	120 - 150
	at 60	48 - 60
	at 80	18 - 26
	at 100	7 - 12
Araldite® LY 3297 / Aradur® 3299	at 40	65 - 80
	at 60	25 - 35
	at 80	10 - 16
	at 100	3 - 7

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.

GELATION AT 23 °C

(IN THIN LAYERS 0.4 - 0.7 MM)

		[*min*]
Araldite® LY 3297 / Aradur® 3298	Start	320 - 360
	End	550 - 600
Araldite® LY 3297 / Aradur® 3299	Start	150 - 190
	End	200 - 240

HUNTSMAN

Enriching lives through innovation

PROPERTIES OF THE CURED, NEAT FORMULATION

GLASS TRANSITION TEMPERATURE (IEC 1006, DSC, 10 K/MIN)	*Cure:*	T_G	*Araldite® LY 3297 Aradur® 3298*	*Araldite® LY 3297 Aradur® 3299*
	3 days 23 °C	[°C]	48 - 53	
	7 days 23 °C	[°C]	45 - 50	54 - 59
	1 day 23°C + 10 h 40 °C	[°C]	54 - 59	60 - 66
	1 day 23°C + 10 h 50 °C	[°C]	58 - 63	70 - 76
	1 day 23°C + 10 h 60 °C	[°C]	67 - 73	78 - 84
	1 day 23°C + 8 h 80 °C	[°C]	75 - 81	94 - 100
	1 day 23°C + 4 h 90 °C	[°C]	92 - 98	99 - 105
	1 day 23°C + 4 h 100 °C	[°C]	92 - 98	98 - 104
			92 - 98	

TORSIONAL TEST (ISO 6721, DMA, 2 K/MIN)		T_G	*Cure: 7 d 23 °C*	*Cure: 4h 100 °C*
	Araldite® LY 3297 / Aradur® 3298	[°C]	52 - 57	95 - 100
	Araldite® LY 3297 / Aradur® 3299	[°C]	53 - 58	95 - 100

FLEXURAL TEST (ISO 178)	*Cure: 8 h 80 °C*		*Araldite® LY 3297 Aradur® 3298*	*Araldite® LY 3297 Aradur® 3299*
	Flexural strength	[MPa]	125 - 130	123 - 128
	Ultimate strength	[MPa]	123 - 128	105 - 115
	Ultimate elongation	[%]	7.0 - 8.2	9.0 - 12.0
	Flexural modulus	[MPa]	2800 - 3000	2800 - 3000

FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	*Cure: 8 h 80 °C*		*Araldite® LY 3297 Aradur® 3298*	*Araldite® LY 3297 Aradur® 3299*
	Fracture toughness K_{1C}	[MPa√m]	0.85 - 0.95	0.80 - 0.90
	Fracture energy G_{1C}	[J/m^2]	215 - 245	195 - 225

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.

HUNTSMAN

Enriching lives through innovation

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.

Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials LLC or of its affiliated companies including without limitation, Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., and Huntsman Advanced Materials (Hong Kong) Ltd.
Huntsman Advanced Materials is an international business unit of Huntsman Corporation. Huntsman Advanced Materials trades through Huntsman affiliated companies in different countries including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

Aradur and Araldite are registered trademarks of Huntsman Corporation or an affiliate thereof.

Main Office :
Huntsman Advanced Materials (Switzerland) GmbH
Klybeckstrasse 200
4057 BASEL
Switzerland
+41 61 966 3333