HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® LY 1564* / Aradur® 22962*

WARM TO HOT CURING EPOXY SYSTEM

Araldite® LY 1564 is a low viscosity epoxy resin
Aradur® 22962 is a cycloaliphatic polyamine

APPLICATIONS

- Industrial composites
- Structural composites

PROPERTIES

Amine-cured laminating system showing excellent flexibility and high reactivity.

PROCESSING

- Wet lay-up
- Filament Winding
- Pressure Moulding
- Resin Transfer Moulding (RTM)
- Pultrusion

PRODUCT DATA

Araldite® LY 1564		
Aspect (visual)	clear yellowish liquid	
Viscosity at 25°C (ISO 12058-1)	1200 – 1400 **	[mPa s]
Density at 25°C (ISO 1675)	1.10 - 1.20	[g/cm^3]
Epoxy Index (ISO 3001)	5.80 – 6.05 **	[eq/kg]
Aradur® 22962		
Aspect (visual)	Colourless-little yellow liquid	
Viscosity at 25°C (ISO 12058-1)	5 - 20	[mPa s]
Density at 25°C (ISO 1675)	0.89 - 0.90	[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 Araldite® LY 1564 and Aradur® 22962 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*

TYPICAL SYSTEM DATA

PROCESSING DATA

MIX RATIO

Components	*Parts by weight*	*Parts by volume*
Araldite® LY 1564	100	100
Aradur® 22962	25	32

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]*
	at 25	400-600
	at 40	100-200

POT LIFE (TECAM, 100 ML, 65 % RH)	*[°C]*	*[min]*
	at 23	110 - 150

GEL TIME (HOT PLATE)	*[°C]*	*[min]*
	at 80	20 30
	at 100	8 - 12
	at 120	3 - 6
	at 140	1.5 – 2.5
	at 160	0.5 – 1.5

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.

TYPICAL CURE CYCLES

1 h 80 °C + 2 h 150 °C
or 15 min 120°C + 2 h 150 °C

The optimum cure cycle has to be determined case by case depending on the processing and the economic requirements.

PROPERTIES OF THE CURED, NEAT FORMULATION

GLASS TRANSITION TEMPERATURE (ISO 11357-2, DSC, 10 K/MIN)	*Cure:*		*T_G [°C]*
	30 min 120 °C		108 - 115
	4 h 80 °C		100 - 110
	4 h 120 °C		120 - 128
	2 h 140 °C		125 - 135
	1 h 80 °C + 2 h 150 °C		128 - 138
	15 min 120 °C + 2 h 150 °C		130 - 140
TENSILE TEST (ISO 527)		*Cure:*	*15 min 120 °C + 2 h 150 °C*
	Tensile strength	[MPa]	75 – 80
	Ultimate elongation	[%]	3.5 – 8.0
	Tensile modulus	[MPa]	2800 – 3300
FLEXURAL TEST (ISO 178)		*Cure:*	*15 min 120 °C + 2 h 150 °C*
	Flexural strength	[MPa]	124 - 132
	Ultimate strength	[MPa]	120 - 135
	Ultimate elongation	[%]	9 - 11
	Flexural modulus	[MPa]	2700 - 2900
FRACTURE PROPERTIES BEND NOTCH TEST (ISO 13586)		*Cure:*	*15 min 120 °C + 2 h 150 °C*
	Fracture toughness K_{1C}	[MPa√m]	0.80 - 0.95
	Fracture energy G_{1C}	[J/m^2]	200 - 260
WATER ABSORPTION (ISO 62)	*Immersion:*	*Cure:*	*15 min 120 °C + 2 h 150 °C*
	4 days H_2O 23 °C	[%]	0.27 – 0.31
	10 days H_2O 23 °C	[%]	0.46 – 0.53

PROPERTIES OF THE CURED, REINFORCED FORMULATION

INTERLAMINAR SHEAR STRENGTH (ASTM D 2344)

Samples: 12 layers E-glass fabrics UD (425 g/m^2)
Laminate thickness = 3.1 - 3.25 min
Fibre volume content: 59 - 63 %
Cure: 15 min 120 °C + 2 h 150 °C

Shear strength	[MPa]	60 - 66

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.

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