HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® LY 3508* / Aradur® 917* / Accelerator DY 070*

TOUGHENED HOT CURING EPOXY SYSTEM

Araldite® LY 3508 (toughened epoxy resin)
Aradur® 917 (anhydride hardener)
Accelerator DY 070 (imidazole accelerator)

APPLICATIONS

High performance composites.

PROPERTIES

Anhydride-cured matrix system with extremely long pot life.
The reactivity of the system is adjustable by variation of the accelerator content.
The system is easy to process and exhibits excellent mechanical, dynamic and thermal properties.

PROCESSING

- Filament Winding
- Pultrusion
- Pressure Moulding

KEY DATA

Araldite® LY 3508		
Aspect (visual)	white liquid	
Epoxy content (ISO 3000)	4.80 - 5.20	[eq/kg]
Viscosity at 25 °C (ISO 2555)	11000 - 20000	[mPa s]
Density at 25 °C (ISO 1675)	1.15 - 1.20	[g/cm^3]
Flash point (ISO 2719)	200	[°C]
Storage temperature (see expiry date on original container)	2 - 40 °C	[°C]

Aradur® 917		
Aspect (visual)	clear liquid	
Colour (Gardner, ISO 4630)	≤ 2	
Viscosity at 25 °C (ISO 12058-1)	50 - 100	[mPa s]
Density at 25 °C (ISO 1675)	1.20 - 1.25	[g/cm^3]
Flash point (ISO 2719)	195	[°C]
Storage temperature (see expiry date on original container)	2 - 40 °C	[°C]

Accelerator DY 070		
Aspect (visual)	clear liquid	
Colour (Gardner, ISO 4630)	≤ 9	
Viscosity at 25 °C (ISO 12058-1)	≤ 50	[mPa s]
Density at 25 °C (ISO 1675)	0.95 - 1.05	[g/cm^3]
Flash point (ISO 2719)	92	[°C]
Storage temperature (see expiry date on original container)	2 - 40 °C	[°C]

* *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.*

STORAGE

Provided that Araldite® LY 3508, Aradur® 917 and Accelerator DY 070 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.
Because Aradur® 917 is sensitive to moisture, storage containers should be ventilated with dry air only.

PROCESSING DATA

MIX RATIO

Components	*Parts by weight*	*Parts by volume*
Araldite® LY 3508	100	100
Aradur® 917	90	86
Accelerator DY 070	0.5 - 2	0.6 - 2.4

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.

PROCESSING RECOMMENDATIONS

To simplify the mixing process the resin can be preheated to about 30 °C to 50 °C before adding the cold hardener. Hardener and accelerator can be premixed, thus allowing the use of two component mixing/metering equipment. The mix of hardener and accelerator has a shelf life of several days.
The processing of the system at elevated temperatures of 30 °C to 40 °C shows the best results. The gelation temperature should not be higher than absolutely necessary. A high gelation temperature induces high shrinkage and generates internal stresses.

ALL THE MENTIONED VALUES ARE DETERMINED BY 1 PBW. OF ACCELERATOR DY 070

INITIAL MIX VISCOSITY (CONE PLATE VISCOSIMETER)	at 25 °C	*[mPas]*	580 - 680
POT LIFE (TECAM, 65 % RH,100 G)	at 23 °C	*[h]*	100 - 110
GEL TIME (HOT PLATE)	at 120 °C	*[min]*	8 - 11
	at 140 °C	*[min]*	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.

TYPICAL CURE CYCLES	Gelation either	2 - 4 h at 80 °C
	or	1 - 3 h at 90 °C
	Post-cure either	4 - 8 h at 120 °C
	or	2 - 8 h at 140 °C

PROPERTIES OF THE CURED, NEAT FORMULATION			
GLASS TRANSITION TEMPERATURE (TG) (IEC 1006, 10 K/MIN)	*Cure:*		*T_G DSC [°C]*
	4 h 80 °C + 4 h 120 °C		130 - 140
	4 h 80 °C + 8 h 140 °C		135 - 145
FLEXURAL TEST (ISO 178)	Cure: 4h 80°C + 8h 140°C		
	Flexural strength	[MPa]	140 - 150
	Elongation at flexural	[%]	5.5 - 6.5
	strength	[MPa]	138 - 148
	Ultimate strength	[%]	5.7 - 6.7
	Ultimate elongation	[MPa]	2900 - 3200
	Flexural modulus		
FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	Cure: 4h 80°C + 8h 140°C		
	Fracture toughness K1C	[MPa√m]	0.85 - 0.95
	Fracture energy G_{1C}	[J/m^2]	210 - 240
WATER ABSORPTION (ISO 62)	Cure: 4h 80°C + 8h 140°C		
	Immersion:		
	10 days H_2O 23 °C	[%]	0.40 - 0.46

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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