HUNTSMAN
Enriching lives through innovation

Advanced Materials

Araldite® LY 5085* / Aradur® 5046*

Araldite® LY 5085 is a low viscosity epoxy resin
Aradur® 5046 is a hardener mixture of polyamines

APPLICATIONS

- Recreational composites
- Structural composites

PROPERTIES

Easy-to-handle laminating system for the production of advanced composites lay-up by wet process.

PROCESSING

- Wet lay-up
- Pressure Moulding

KEY DATA

Araldite® LY 5085		
Aspect (visual)	liquid	
Colour (Gardner, ISO 4630)	≤ 3	
Viscosity at 25 °C (ISO 12058-1)	7000 - 9000	[mPa s]
Density at 25 °C (ISO 1675)	1.16	[g/cm^3]
Flash point (ISO 2719)	> 200	[°C]
Storage temperature (see expiry date on original container)	2 - 40	[°C]

Aradur® 5046		
Aspect (visual)	black liquid	
Colour (Gardner, ISO 4630)	≤ 8	
Viscosity at 25 °C (ISO 12058-1)	10 - 20	[mPa s]
Density at 25 °C (ISO 1675)	0.90	[g/cm^3]
Flash point (ISO 2719)	105	[°C]
Storage temperature (see expiry date on original container)	2 - 40	[°C]

STORAGE

Provided that the products described above are stored in a dry place in their original, properly closed containers at the above mentioned storage tem-peratures they will have the shelf lives indicated on the labels.

Partly emptied containers should be closed immediately after use.

Araldite® LY 5085 which has crystallized and looks cloudy can be restored to its original state by heating to 60 - 80 °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.*

PROCESSING DATA

MIX RATIO

Components	*Parts by weight*	*Parts by volume*
Araldite® LY 5085	100	100
Aradur® 5046	14 - 15	18 - 19

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	1200 - 1500
at 40	500 - 550

VISCOSITY BUILD-UP

(HOEPPLER, ISO 12058-1B)

[°C]	*[mPa s]*	*[min]*
at 25	to 3000	25 - 35

POT LIFE

(TECAM, 100 ML, 65 % RH)

[°C]	*[min]*
at 23	150 - 180

GEL TIME

(HOT PLATE)

[°C]	*[min]*
at 80	9 - 13
at 90	5 - 7
at 100	4 - 5
at 110	3 - 4
at 120	3

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

60 min 80 °C
or 10 min 110 °C
or 8 min 120 °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 (IEC 1006, DSC, 10 K/MIN)	*Cure:*			*T_G [°C]*
	150 min 60 °C			88
	60 min 80 °C			95
	25 min 90 °C			87
	60 min 90 °C			79
	20 min 100 °C			68
	30 min 100 °C			71
	15 min 110 °C			64
	15 min 120 °C			65
	15 min 140 °C			63
FLEXURAL TEST (ISO 178)		*Cure:*	*10 min 80 °C + 20 min 100 °C*	*1 h 110 °C*
	Flexural strength	[MPa]	90 - 100	105 - 120
	Elongation at flexural strength	[%]	5 - 6	5 - 6
	Ultimate strength	[MPa]	60 - 80	85 - 100
	Ultimate elongation	[%]	10 - 14	9 - 10.5
TENSILE TEST (ISO 527)		*Cure:*	*10 min 80 °C + 20 min 100 °C*	
	Tensile strength	[MPa]	60 - 68	
	Elongation at tensile strength	[%]	4.0 - 4.5	
	Ultimate strength	[MPa]	56 - 63	
	Ultimate elongation	[%]	6.0 - 7.4	
	Tensile modulus	[MPa]	3100 - 3300	
WATER ABSORPTION (ISO 62)	*Immersion:*	*Cure:*	*10 min 80 °C + 20 min 100 °C*	
	1 day H_2O 23 °C	[%]	0.25	
	4 days H_2O 23 °C	[%]	0.58	
	10 days H_2O 100 °C	[%]	1.01	
LAB SHEAR STRENGTH TEST ON DIFFERENT MATERIALS (ISO 4587)		*Cure:*	*10 min 80 °C + 20 min 100 °C*	
	Alu/Alu	[MPa]	13.1 - 14.4	
	Alu/ABS	[MPa]	12.5 - 15.7	
	Alu/Zicral	[MPa]	9.9 - 12.2	
	Steel/Steel	[MPa]	16.6 - 17.16	

PROPERTIES OF THE CURED, REINFORCED FORMULATION

INTERLAMINAR SHEAR STRENGTH (ASTM D 2344)	Short beam: Laminate comprising 12 layers unidirectional E-glass fabric (425 g/m^2) Laminate thickness t = 3.0 - 3.3 mm Fibre volume content: 58 - 60 % Cure: 20 min 60 °C + 20 min 100 °C		
	Unconditioned	[MPa]	50 - 53
	After 10 days in H_2O 23 °C	[MPa]	41 - 47
WATER ABSORPTION (ISO 62)	Laminate comprising 12 layers unidirectional E-glass fabric (425 g/m^2) Laminate thickness t = 3.0 - 3.3 mm Fibre volume content: 58 - 60 % Cure: 20 min 60 °C + 20 min 100 °C		
	1 day H_2O 23 °C	[%]	0.07
	4 days H_2O 23 °C	[%]	0.14
	10 days H_2O 23 °C	[%]	0.26

HANDLING PRECAUTIONS

Personal hygiene	
Safety precautions at workplace	
protective clothing	overalls
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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