

Araldite[®] LY 564 / Aradur[®] 956-1 / Accelerator 960-1

Cold Curing Epoxy Matrix System

Applications	Industrial composites (tubes, pipes, profiles)	
General	Araldite LY 564 with Aradur 956-1 and Accelerator 960-1 exhibits high reactivity at low temperatures with good mechanical properties.	
Chemical Description	Araldite LY 564 is a low viscosity epoxy resin. Aradur 956-1 is an aliphatic amine Accelerator 960-1 is used as an amine accelerator	
Processing	Resin Transfer Molding (RTM) Pressure Molding Wet Lay-up	
Advantages	Ease of mixing Complete impregnation of fibers Room temperature processing Good mechanical properties	
Typical Properties*	Araldite LY 564	
	Visual Appearance	Clear, no contamination
	Color, Gardner, max	2
	Epoxy Value, eq./kg	5.7 - 6.0
	Epoxy Equivalent, g/eq.	165 - 175
	Viscosity @ 25°C (77°F), mPa s (cPs)	1200 - 1400
	Density @ 25°C (77°F), g/cm ³ (lb/gal.)	1.15 - 1.18 (9.6 - 9.8)
	Aradur 956-1	
	Visual Appearance	clear liquid
	Color, Gardner, max	4
	Viscosity @ 25°C (77°F), mPa s (cps)	290 - 500
	Density @ 25°C (77°F), g/cm ³ (lb/gal.)	1.02 (8.5)

Typical Properties* (continued)	Accelerator 960-1	
	Visual Appearance	clear liquid
	Color, Gardner, max	8
	Viscosity @ 25°C (77°F), mPa s (cps)	150 - 300
	Density @ 25°C (77°F), g/cm ³ (lb/gal.)	1.00 - 1.02 (8.4 - 8.5)

* Typical properties are based on Huntsman's test methods. Copies are available upon request.

Mix Ratios	Components	Parts by weight	Parts by volume
	Araldite LY 564	100	100
	Aradur 956-1	24.8	28.5
	Accelerator 960-1	2.2	2.5

The two hardeners should be premixed and then added to the resin. The components should be mixed thoroughly to ensure homogeneity.

Curing	Typical Curing Schedules	15 hrs @ 50°C or 4 hrs @ 80°C or 2 hrs @ 100°C
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Processing	Initial Viscosity (cPs)		
	@ 25°C	600 - 1000	
	@ 40°C	200 - 250	
	Viscosity build-up		
	@25°C	to 1500 cPs	15 - 25 min
	@25°C	to 3000 cPs	20 - 50 min
	@40°C	to 1500 cPs	17 - 25 min
	@40°C	to 3000 cPs	22 - 30 min
	Gel Times (Hot Plate)		
	@ 40°C	75 - 85 min	
	@ 60°C	20 - 30 min	
	@ 80°C	5 - 9 min	
	@ 100°C	1 - 3 min	
@ 120°C	0.5 - 1.5 min		

Glass Transition Temperature (DSC)	Cure:	Tg (°C)
	7 days 25°C	46 - 55
	15 h 50°C	74 - 85
	15 h 60°C	77 - 86
	4 h 80°C	90 - 100
	4 h 100°C	90 - 100

Cured Properties	Neat Resin Properties				
	Cure	<u>7 days RT</u>	<u>15h 50°C</u>	<u>4 h 80°C</u>	
	Tensile Strength (kpsi)	9.3	11.5	11.2	
	Tensile Elongation (%)	2.1	5.3	6.0	
	Tensile Modulus (ksi)	540	502	450	
	Flexural strength (kpsi)			19.0	
	Flexural Modulus (kpsi)			450	
	Flexural Elongation (%)			9.5	
	Fracture Toughness K_{IC} ($\sqrt{\text{in}\cdot\text{lb}/\text{in}^2}$)		650 ± 45		
	Fracture Energy G_{IC} ($\text{in}\cdot\text{lb}/\text{in}^2$)		0.74 ± 0.05		
Water Absorption	Immersion:	Cure:	<u>7 days RT</u>	<u>15h 50°C</u>	<u>4 h 80°C</u>
	4 day H ₂ O 23°C (%)		0.68	0.54	0.34
	10 days H ₂ O 23°C (%)		1.15	1.02	0.72
	30min H ₂ O 100°C (%)		0.80	0.74	0.66
	60 min H ₂ O 100°C (%)		1.14	1.10	1.04
Coefficient of Linear Thermal Expansion	Mean Value:	Cure:			<u>15h 50°C</u>
	α from 20-90°C ($10^{-6}/\text{K}$)		72		
Poisson's Ratio			0.35		
Laminate Properties	Flexural				
	Samples: E-glass fabric 1:1 (300g/m ²), 16 layers				
	Fiber volume content: 45 - 46%				
	Laminate thickness t = 4mm				
	Cure:		7 days RT		15 h 50°C
	Unconditioned				
	Flexural strength (kpsi)		65		73
	Flexural Modulus (kpsi)		3180		2900
	Flexural Elongation (%)		2.8		3.2
	Interlaminar Shear Strength (ILSS)				
	Short Beam:				
	Samples: E-glass fabric(425g/m ²), 12 layers unidirectional				
	Fiber volume content: 59 - 64%				
	Laminate thickness t=3.0 - 3.3mm				
	Cure:		7 days RT		15 h 50°C
	Unconditioned				
	Shear Strength (psi)		6500		7500

Packaging & Storage

Store at 40 - 104°F. Partially used containers should be immediately closed after use and stored in a dry environment.
Araldite LY 564 is supplied in 55 pound steel drums.
Aradur 956-1 is supplied in 450 pound steel drums.
Accelerator 960-1 is supplied in 440 pound steel drums.

**Handling/Safety
Precautions**

Read Material Safety Data Sheet For Each Product Before Using.
For Industrial Use Only.

First Aid**In case of contact:**

Ingestion: If swallowed, immediately give at least 3-4 glasses of water, but do not induce vomiting. If vomiting occurs, give fluids again. Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention. Have a physician determine whether vomiting or stomach evacuation is necessary.

Skin: Under a safety shower, immediately remove contaminated clothing and shoes. Wash affected areas thoroughly with large amounts of water, and soap if available, for at least 15 minutes. Get immediate medical attention. Discard or decontaminate clothing before re-use and destroy contaminated shoes.

Inhalation: Remove from area to fresh air. If not breathing, give artificial respiration. Get immediate medical attention. If breathing is difficult, transport to medical care and, if available, give supplemental oxygen.

Eyes: Immediately flush eyes for at least 15 minutes with running water. Hold eyelids apart to ensure rinsing of the entire eye surface and lids with water. If physician is not available, flush for an additional 15 minutes. Get immediate medical attention.

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March, 2004