

Advanced Materials**Araldite[®] LY 1564 SP / Aradur[®] 2954****WARM TO HOT CURING EPOXY SYSTEM**

Araldite[®] LY 1564 SP is an epoxy resin
Aradur[®] 2954 is a cycloaliphatic polyamine

APPLICATIONS	<ul style="list-style-type: none">• Industrial composites• Structural composites
PROPERTIES	Amine-cured laminating system without reactive diluent showing excellent flexibility and high reactivity.
PROCESSING	Filament Winding Pressure Moulding Resin Transfer Moulding (RTM) Wet Lay-up
KEY DATA	Araldite[®] LY 1564 SP
	Aspect (visual) clear, pale yellow liquid
	Color (Gardner, ISO 4630) 1- 2
	Viscosity at 25 °C (ISO 12058-1) 1200 - 1400 [cps]
	Density at 25 °C (ISO 1675) 1.1 - 1.2 [g/cm ³]
	Flash point (ISO 2719) > 365[185] °F [°C]
	Aradur[®] 2954
	Aspect (visual) clear liquid
	Color (Gardner, ISO 4630) < 2
	Viscosity at 25 °C (ISO 12058-1) 70 – 120 [cps]
	Density at 25 °C (ISO 1675) 0.94 - 0.95 [g/cm ³]
	Flash point (ISO 2719) 173 [°C]

PROCESSING DATA

MIX RATIO	<i>Components</i>	<i>Parts by weight</i>	<i>Parts by volume</i>
	Araldite® LY 1564 SP	100	100
	Aradur® 2954	35	42

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	<i>°F [°C]</i>	<i>[cps]</i>
(HOEPLER, ISO 12058-1B)	at 77 [25]	500 - 700
	at 104 [40]	200 - 300
	at 140 [60]	70 - 130

VISCOSITY BUILD-UP	<i>°F [°C]</i>	<i>[cps]</i>	<i>[min]</i>
(HOEPLER, ISO 12058-1B)	at 77 [25]	to 1500	150 - 180
	at 104 [40]	to 1500	100 - 130

POT LIFE	<i>°F [°C]</i>	<i>[hours]</i>
(TECAM, 100 ML, 65 % RH)	at 73 [23]	480 - 600
	at 104 [40]	140 - 160

GEL TIME	<i>°F [°C]</i>	<i>[min]</i>
(HOT PLATE)	140 [60]	90 - 120
	at 176 [80]	35 - 45
	at 212 [100]	16 - 18
	at 284 [140]	3 - 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	2 h 140°F + 4 - 8 h 248°F or 1 h 176°F + 2 - 8 h 248°F or 0.5 h 212°F + 2 - 8 h 320°F
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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)	<i>Cure:</i> 30 min 248°F (120°C) 4 h 176°F (80 °C) 4 h 248°F (120°C) 2 h 284°F (140 °C) 1 h 176°F (80 °C)+ 2 h 302°F (150 °C) 15 min 248°F (120°C)+ 2 h 302°F (150 °C)	<i>T_G [°F]</i> 226 - 239 212 - 230 248 - 262 257 - 275 262 - 280 266 - 284
TENSILE TEST (ISO 527)	<i>Cure:</i> 15 min 248°F + 2 h 302°F	
	Tensile strength [Kpsi]	10.9 – 11.6
	Elongation [%]	3.5 – 8.0
	Tensile modulus [Kpsi]	406 – 479
FLEXURAL TEST (ISO 178)	<i>Cure:</i> 15 min 248°F + 2 h 302°F	
	Flexural strength [Kpsi]	18.0 – 19.1
	Ultimate strength [Kpsi]	17.4 – 19.6
	Ultimate elongation [%]	9 - 11
	Flexural modulus [Kpsi]	392 - 421
FRACTURE PROPERTIES	<i>Cure:</i> 15 min 248°F + 2 h 302°F	
BEND NOTCH TEST (PM 258-0/90)	Fracture toughness K _{1C} [psi√inch] Fracture energy G _{1C} [in-lb/inch ²]	879 - 1044 1.14 – 1.48
WATER ABSORPTION (ISO 62)	<i>Immersion:</i> 1 day H ₂ O 73°F [%] 10 days H ₂ O 73°F [%]	<i>Cure:</i> 15 min 248°F + 2 h 302°F 0.27 – 0.31 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 248°F + 2 h 302 °F	
	Shear strength [Kpsi]	8.7 -9.6

STORAGE Araldite® LY 1564 SP should be stored in a dry place, in the sealed original container, away from heat and humidity, at temperatures between +2°C and +40°C (+35.6°F and +104°F). Under these storage conditions, the shelf life is 6 years. The product should not be exposed to direct sunlight.

Aradur® 2954 should be stored in a dry place, in the sealed original container, away from heat and humidity, at temperatures between +2°C and +40°C (+35.6°F and +104°F). Under these storage conditions, the shelf life is 6 years. The product should not be exposed to direct sunlight.

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First Aid!

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