

Toughened hot curing epoxy system based on Araldite[®] XU 3508* / Aradur[®] 917* / Accelerator DY 070*

Resin XU 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	<ul style="list-style-type: none"> • Filament Winding • Pultrusion • Pressure Moulding 		
Key data	Araldite XU 3508		
	Aspect (visual)	white liquid	
	Epoxy content (ISO 3000)	4.80 - 5.20	[eq/kg]
	Viscosity at 25 °C (ISO 12058-1)	11000 - 13000	[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 XU 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 XU 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
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Pot life (Tecam, 65 % RH, 100 g)	at 23°C	[h]	100 - 110
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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 (T_G) (IEC 1006, 10 K/min)	<i>Cure:</i>		T_G DSC [$^{\circ}$ C]
	4 h 80 $^{\circ}$ C + 4 h 120 $^{\circ}$ C		130 - 140
	4 h 80 $^{\circ}$ C + 8 h 140 $^{\circ}$ C		135 - 145
Flexural test (ISO 178)	Cure: 4h 80 $^{\circ}$ C + 8h 140 $^{\circ}$ C		
	Flexural strength	[MPa]	140 - 150
	Elongation at flexural strength	[%]	5.5 - 6.5
	Ultimate strength	[MPa]	138 - 148
	Ultimate elongation	[%]	5.7 - 6.7
	Flexural modulus	[MPa]	2900 - 3200
Fracture properties Bend notch test (PM 258-0/90)	Cure: 4h 80 $^{\circ}$ C + 8h 140 $^{\circ}$ C		
	Fracture toughness K _{1C}	[MPa \sqrt m]	0.85 - 0.95
	Fracture energy G _{1C}	[J/m ²]	210 - 240
Water absorption (ISO 62)	Cure: 4h 80 $^{\circ}$ C + 8h 140 $^{\circ}$ C		
	<i>Immersion:</i>		
	10 days H ₂ O 23 $^{\circ}$ C	[%]	0.40 - 0.46

Handling precautions	<p>Mandatory and recommended industrial hygiene procedures should be followed whenever our products are being handled and processed. For additional information please consult the corresponding product safety data sheets and the brochure "Hygienic precautions for handling plastics products" .</p> <p>Personal hygiene</p> <p><i>Safety precautions at workplace</i></p> <table border="0"> <tr> <td>protective clothing</td> <td>yes</td> </tr> <tr> <td>gloves</td> <td>essential</td> </tr> <tr> <td>arm protectors</td> <td>recommended when skin contact likely</td> </tr> <tr> <td>goggles/safety glasses</td> <td>yes</td> </tr> </table> <p><i>Skin protection</i></p> <table border="0"> <tr> <td>before starting work</td> <td>Apply barrier cream to exposed skin</td> </tr> <tr> <td>after washing</td> <td>Apply barrier or nourishing cream</td> </tr> </table> <p><i>Cleansing of contaminated skin</i></p> <p>Dab off with absorbent paper, wash with warm water and alkali-free soap, then dry with disposable towels. Do not use solvents</p> <p><i>Disposal of spillage</i></p> <p>Soak up with sawdust or cotton waste and deposit in plastic-lined bin</p> <p><i>Ventilation</i></p> <table border="0"> <tr> <td>of workshop</td> <td>Renew air 3 to 5 times an hour</td> </tr> <tr> <td>of workplaces</td> <td>Exhaust fans. Operatives should avoid inhaling vapours</td> </tr> </table>	protective clothing	yes	gloves	essential	arm protectors	recommended when skin contact likely	goggles/safety glasses	yes	before starting work	Apply barrier cream to exposed skin	after washing	Apply barrier or nourishing cream	of workshop	Renew air 3 to 5 times an hour	of workplaces	Exhaust fans. Operatives should avoid inhaling vapours
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First aid	<p>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.</p> <p>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.</p> <p>Anyone taken ill after <i>inhaling</i> vapours should be moved out of doors immediately.</p> <p>In all cases of doubt call for medical assistance.</p>
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Note	<p>Araldite[®] and Aradur[®] are registered trademarks of Huntsman LLC or an affiliate thereof in one or more countries, but not all countries.</p>
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<p>Huntsman LLC [®]Registered trademark</p> 	<p>IMPORTANT: The following supersedes Buyer's documents. SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.</p>
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