

Advanced Materials**Resin XU 3508 / Aradur[®] 917 /
Accelerator DY 070****TOUGHENED HOT CURING EPOXY SYSTEM**

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 | Resin XU 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] |
| | 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] |
| | 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] |

PROCESSING DATA

| MIX RATIO | <i>Components</i> | <i>Parts by weight</i> | <i>Parts by volume</i> |
|------------------|-------------------------|------------------------|------------------------|
| | Resin 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 73°C | [cps] | 580 - 680 |
|---------------------------|---------|-------|-----------|

POT LIFE

| | | | |
|-------------------------|---------|-----|-----------|
| (TECAM, 65 % RH, 100 G) | at 73°C | [h] | 100 - 110 |
|-------------------------|---------|-----|-----------|

GEL TIME

| | | | |
|-------------|----------|-------|--------|
| (HOT PLATE) | at 248°F | [min] | 8 - 11 |
| | at 184°F | [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 176 °F |
| | or | 1 - 3 h at 194 °F |
| | Post-cure either | 4 - 8 h at 248 °F |
| | or | 2 - 8 h at 284 °F |

PROPERTIES OF THE CURED, NEAT FORMULATION

| | | | |
|---|---|-----------------------------|--|
| GLASS TRANSITION TEMPERATURE (TG) (IEC 1006, 10 K/MIN) | <i>Cure:</i> 4 h 176 °F + 4 h 248 °F 4 h 176 °F + 8 h 284 °F | | T_G DSC [°F] 266 - 284 275 - 293 |
| FLEXURAL TEST (ISO 178) | <i>Cure:</i> 4h 176°F + 8h 284°F | | |
| | Flexural strength | [Kpsi] | 20.3 – 21.8 |
| | Elongation at flexural strength | [%] | 5.5 - 6.5 |
| | Ultimate strength | [Kpsi] | 20.0 – 21.5 |
| | Ultimate elongation | [%] | 5.7 - 6.7 |
| | Flexural modulus | [Kpsi] | 421 - 464 |
| FRACTURE PROPERTIES | <i>Cure:</i> 4h 176°F+ 8h 284°F | | |
| BEND NOTCH TEST (PM 258-0/90) | Fracture toughness K _{1C} | [psi√inch] | 934 - 1044 |
| | Fracture energy G _{1C} | [in-lb/inch ²] | 1.20 – 1.37 |
| WATER ABSORPTION (ISO 62) | <i>Cure:</i> 4h 176°F + 8h 284°F <i>Immersion:</i> 10 days H ₂ O 73 °F | | |
| | | [%] | 0.40 - 0.46 |

STORAGE

Resin XU 3508 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 3 years. The product should not be exposed to direct sunlight.

Aradur® 917 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 2 years. The product should not be exposed to direct sunlight. Because Aradur® 917 is sensitive to moisture, storage containers should be ventilated with dry air only.

Accelerator DY 070 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 3 years. The product should not be exposed to direct sunlight.

Partly emptied containers should be closed immediately after use.

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First Aid!

Refer to MSDS as mentioned above.

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