

Advanced Materials**Resin XU 3508 / Resin XB 3585 / Araldite® LY 564
Hardener XB 3458**

COLD TO WARM-CURING EPOXY SYSTEM BASED ON

APPLICATIONS	Industrial composites, composite repair		
PROPERTIES	High reactivity system for composite parts		
PROCESSING	<ul style="list-style-type: none">• Wet lay-up• Resin Transfer Moulding		
KEY DATA	Resin XU 3508		
Aspect (visual)	white liquid		
Viscosity at 25 °C (ISO 12058-1)	11000 - 13000		[mPa.s]
Density at 25 °C (ISO 1675)	1.15 - 1.2		[g/cm ³]
Flash point (ISO 2719)	200		[°C]
Storage temperature (see expiry date on original container)	2 - 40		[°C]
	Resin XB 3585		
Aspect (visual)	clear liquid		
Viscosity at 25 °C (ISO 12058-1)	6500 - 9000		[mPa.s]
Colour (Gardner, ISO 4630)	≤ 3		
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]
	Araldite® LY 564		
Aspect (visual)	clear liquid		
Viscosity at 25 °C (ISO 12058-1)	1200 - 1400		[mPa.s]
Colour (Gardner, ISO 4630)	1 - 2		
Density at 25 °C (ISO 1675)	1.1 - 1.2		[g/cm ³]
Flash point (ISO 2719)	185		[°C]
Storage temperature (see expiry date on original container)	2 - 40		[°C]
	Hardener XB 3458		
Aspect (visual)	clear to slightly yellow / red liquid		
Viscosity at 25 °C (ISO 12058-1)	190 - 250		[mPa.s]
Density at 25 °C (ISO 1675)	0.98 - 1.02		[g/cm ³]
Flash point (ISO 2719)	> 102		[°C]
Storage temperature (see expiry date on original container)	2 - 40		[°C]

STORAGE Provided that Resin XU 3508 / Resin XB 3585 / Araldite® LY 564 and Hardener XB 3458 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. Epoxy Resin XU 3508 or XB 3585 which has crystallized and looks cloudy can be restored to its original state by heating to 60 - 80°C.

PROCESSING DATA

MIX RATIO	Components	Parts by weight	Parts by volume
	Resin XU 3508	100	100
	Hardener XB 3458	18	22
	Resin XB 3585	100	100
	Hardener XB 3458	19	23
	Araldite® LY 564	100	100
	Hardener XB 3458	20	24

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.

For industrial parts production we recommend to use a mixing/dosing device

MIX VISCOSITY			XU 3508 XB 3458	XB 3585 XB 3458	LY 564 XB 3458
	at 40°C	[mPa.s]	700 - 850	450 - 550	220 - 320
	at 60°C	[mPa.s]	320 - 400	100 - 160	50 - 110
	at 70°C	[mPa.s]	250 - 290	40 - 70	30 - 60
	at 80°C	[mPa.s]	150 - 190	30 - 60	20 - 50
POT LIFE (TECAM 100 G)			XU 3508 XB 3458	XB 3585 XB 3458	LY 564 XB 3458
	at 23°C	[min]	14 - 18	14 - 18	13 - 17
GEL TIME (HOT PLATE)			XU 3508 XB 3458	XB 3585 XB 3458	LY 564 XB 3458
	at 40°C	[min]	23 - 30	23 - 30	30 - 37
	at 50°C	[min]	12 - 17	12 - 17	16 - 22
	at 60°C	[min]	6 - 10	6 - 10	6 - 11
	at 70°C	[min]	3 - 7	3 - 7	4 - 8
	at 80°C	[min]	2 - 4	2 - 4	2 - 4
	at 100°C	[min]	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5
GELATION AT 28°C (IN THIN LAYERS: 0.4-0.7 MM)			XU 3508 XB 3458	XB 3585 XB 3458	LY 564 XB 3458
	Start	[min]	60 - 80	70 - 90	90 - 100
	End	[min]	95 - 125	95 - 125	95 - 125

PROPERTIES OF THE CURED, NEAT FORMULATION

GLASS TRANSITION TEMPERATURE (IEC 1006, DSC, 10 K/MIN)	<i>Cure:</i>	T_g	<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	1d 23°C	[°C]	50 - 60	50 - 60	50 - 58
	3d 23°C	[°C]	55 - 65	55 - 65	55 - 63
	7d 23°C	[°C]	60 - 70	60 - 70	58 - 66
	3h 40°C	[°C]	60 - 70	60 - 70	60 - 69
	2h 50°C	[°C]	65 - 75	65 - 75	65 - 73
	1h 60°C	[°C]	73 - 83	75 - 85	70 - 78
	15min 80°C	[°C]	86 - 96	86 - 96	79 - 86
	1h 80°C	[°C]	88 - 98	88 - 98	88 - 96
	3min 100°C	[°C]	96 - 106	96 - 106	90 - 98
	10min 100°C	[°C]	98 - 108	98 - 108	90 - 98
	10min 80°C+20min 100°C	[°C]	100 - 110	100 - 110	92 - 102
	10min 80°C+20min 120°C	[°C]	100 - 110	100 - 110	95 - 105
	10min 80°C+20min 130°C	[°C]	112 - 122	115 - 125	96 - 106
FLEXURAL TEST (ISO 178)	<i>Cure:</i> 7d 23°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	Flexural strength	[MPa]	100 - 110	145 - 155	130 - 145
	Elongation at flexural strength	[%]	3 - 5	4 - 6	3 - 5
	Ultimate strength	[MPa]	100 - 110	120 - 130	125 - 135
	Ultimate elongation	[%]	3 - 5	5 - 7	4 - 7
	Flexural modulus	[MPa]	3450 - 3650	3650 - 3850	3750 - 3950
FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	<i>Cure:</i> 7d 23°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	Fracture toughness K_{1C}	[MPa√m]	1.30 - 1.60	0.70 - 1.00	0.75 - 1.05
	Fracture energy G_{1C}	[J/m ²]	480 - 580	130 - 150	160 - 200
WATER ABSORPTION	<i>Cure:</i> 7d 23°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	After 24 hours at 23°C	[%]	0.10 - 0.15	0.12 - 0.16	0.18 - 0.22
	After 168 hours at 23°C	[%]	0.40 - 0.50	0.45 - 0.50	0.60 - 0.65
FLEXURAL TEST (ISO 178)	<i>Cure:</i> 10min 80°C + 20min 100°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	Flexural strength	[MPa]	115 - 125	120 - 140	125 - 140
	Elongation at flexural strength	[%]	4 - 6	5 - 6	5 - 6
	Ultimate strength	[MPa]	110 - 120	85 - 100	85 - 100
	Ultimate elongation	[%]	4 - 7	5 - 7	6.5 - 9.0
	Flexural modulus	[MPa]	3050 - 3300	3200 - 3500	3150 - 3350
WATER ABSORPTION	<i>Cure:</i> 10min 80°C + 20min 100°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	After 24 hours at 23°C	[%]	0.10 - 0.15	0.12 - 0.16	0.13 - 0.18
	After 168 hours at 23°C	[%]	0.34 - 0.40	0.35 - 0.40	0.37 - 0.42
FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	<i>Cure:</i> 10min 80°C + 20min 100°C		<i>XU 3508</i> <i>XB 3458</i>	<i>XB 3585</i> <i>XB 3458</i>	<i>LY 564</i> <i>XB 3458</i>
	Fracture toughness K_{1C}	[MPa√m]	1.20 - 1.35	1.05 - 1.20	1.20 - 1.50
	Fracture energy G_{1C}	[J/m ²]	380 - 500	280 - 325	420 - 520

FLEXURAL TEST (ISO 178)	<i>Cure:</i>		<i>XU 3508</i>	<i>XB 3585</i>	<i>LY 564</i>
		<i>10min 80°C + 120min 120°C</i>	<i>XB 3458</i>	<i>XB 3458</i>	<i>XB 3458</i>
	Flexural strength	[MPa]	110 – 130	115 - 135	115 - 135
	Elongation at flexural strength	[%]	4 - 6	4 - 7	5 - 8
	Ultimate strength	[MPa]	105 - 125	110 - 130	110 - 130
	Ultimate elongation	[%]	4 - 7	5 - 7	6 - 9
	Flexural modulus	[MPa]	3000 - 3300	3100 - 3300	3150 - 3350
FRACTURE PROPERTIES BEND NOTCH TEST (PM 258-0/90)	<i>Cure:</i>		<i>XU 3508</i>	<i>XB 3585</i>	<i>LY 564</i>
		<i>10min 80°C + 120min 120°C</i>	<i>XB 3458</i>	<i>XB 3458</i>	<i>XB 3458</i>
	Fracture toughness K_{1C}	[MPa \sqrt{m}]	1.10 - 1.25	0.90 - 1.20	1.20 - 1.50
	Fracture energy G_{1C}	[J/m ²]	350 - 550	250 - 320	400 - 480
COMPRESSION TEST (ISO 604/85)	<i>Cure:</i>		<i>XU 3508</i>	<i>XB 3585</i>	<i>LY 564</i>
		<i>10min 80°C+120min 120°C</i>	<i>XB 3458</i>	<i>XB 3458</i>	<i>XB 3458</i>
	Compression strength	[MPa]	95 - 110	105 - 120	95 - 115
	Elongation at Compression strength	[%]	9 - 12	7 - 10	6 - 9
	Compression modulus	[MPa]	3000 - 3300	3200 - 3600	3200 - 3600
TENSILE TEST (ISO 527)	<i>Cure:</i>		<i>XU 3508</i>	<i>XB 3585</i>	<i>LY 564</i>
		<i>10min 80°C+120min120°C</i>	<i>XB 3458</i>	<i>XB 3458</i>	<i>XB 3458</i>
	Tensile strength	[MPa]	60 - 80	60 - 80	70 - 90
	Ultimate elongation	[%]	3 - 6	3 - 6	4 - 7
	Tensile modulus	[MPa]	2900 - 3200	3100 - 3400	3000 - 3300

**HANDLING
PRECAUTIONS****Personal hygiene***Safety precautions at workplace*

protective clothing	yes
gloves	essential
arm protectors	recommended when skin contact likely
<u>goggles/safety glasses</u>	yes

Skin protection

before starting work	Apply barrier cream to exposed skin
<u>after washing</u>	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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