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General Industry Advanced Materials Selector guide

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Huntsman Advanced Materials is a leading global supplier of advanced high performance materials for the design, prototyping and production of industrial components.

We combine formulation expertise and applications know-how with in-depth market knowledge, to provide innovative solutions to the industries using fiber reinforcement technologies.

www.huntsman.com/advanced_materials

Stereolithography resins

Product designation	Colour	Viscosity	Hardness	Flex. Modulus	Ult. Tensile Strength	Elongation at Break	Notched Izod Impact	HDT	Comments
Conditions		28°C		RT	RT	RT		0.46 (1.8) MPa	
Norm		ASTM D-2240		ASTM D-790	ASTM D-638	ASTM D-638	ASTM D-256	ASTM D-648	
Unit		(mPa.s)	(Shore D)	(MPa)	(MPa)	(%)	(J/m)	(°C)	

For use on SLA® 3500, SLA® 5000, SLA® 7000, Viper si2™ (solid state laser)

General purpose

RenShape® SL 5195	Clear amber	220	83	1 600	47	11	53	47 (43)	Highly accurate for master pattern (SLA® 5000 only)
RenShape® SL 5510	Clear amber	230	86	3 000	77	5	27	62 (53)	Highest accuracy (not suitable for SLA® 7000)
RenShape® SL 7510	Clear amber	400	87	2 400	44-57	10-14	32-37	51-58 (47-49)	Accurate multifunctional parts with high throughput (not suitable for SLA® 7000)
RenShape® SL 7520	Clear amber	570	86	2 800-2 900	62-65	5-7	15-18	54 (49)	High throughput, multifunctional parts (SLA® 7000 only)
RenShape® SL 7565	Clear Lt. amber	206	84	1 900-2 100	46-54	19-30	27-38	50 (118)	Clear ABS-like parts

Investment casting

RenShape® SL 7800	Clear amber	240	87	2 300-2 700	41-47	10-18	37-58	62 (-)	Highly accurate and dimensionally stable for Quickcast™ patterns
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PP-like

RenShape® SL 7545	Clear amber	430	79	1 400-1 600	27-37	12-21	28-39	48-50 (43-48)	Durable PP-like parts
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White ABS-like

RenShape® SL 7580	White	580	84	2 400	53	11	34	63 (52)	Durable ABS-like parts
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High heat resistance

RenShape® SL 5530	Clear amber	270	88	2 600-3 400	57-61	3-4	21	70-85 (55-58)	HDT reaches 250°C after thermal post cure
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High clarity

RenShape® SL 7570	Clear	180	89	2 500-2 800	60	6-7	24-26	55 (122)	Clear, glass-like appearance parts
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For use on SLA® 250 (He-Cd laser)

RenShape® SL 5170	Clear amber	220	85	3 000	60	7-19	27-37	55 (49)	Highly accurate for master pattern
RenShape® SL 5240	Amber	350	84	1 500	37	22-26	43-53	58 (50)	PP-like parts suitable for «snap-fit»
RenShape® SL 5260	White	290	85	2 400	58	12	40	58 (51)	Durable ABS-like parts with fine features

RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature • Quickcast™ is a trademark of 3D Systems Corporation

Cold to hot curing matrix systems • Wet lay-up, RTM

Product designation	Pot Life	Gel Time	Recommended Cure Schedule	Tg (Max)	Flexural Strength	Ultimate Flexural Elongation	Fracture properties* K _{1c} G _{1c}
Conditions	RT / 100 ml	80°C		DSC, 10 K/min			
Norm				IEC 1006	ISO 178		
Unit	(min)	(min)	(°C)	(°C)	(MPa)	(%)	(MPa√m) (J/m²)

Pot life < 20 minutes

Araldite® LY 564 / Hardener XB 3458	13-17	2-4	10 min @ 80 + 20 min @ 100	96-106	125-140	6.5-9.0	1.20-1.50 420-520
Resin XB 3585 / Hardener XB 3458	14-18	2-4	10 min @ 80 + 20 min @ 100	115-125	120-140	5.0-7.0	1.05-1.15 280-320
Resin XU 3508 / Hardener XB 3458	14-18	2-4	10 min @ 80 + 20 min @ 100	112-122	115-125	4.0-7.0	1.20-1.35 380-500

To obtain more detailed data about these products, please use our product finder tool by visiting the website www.huntsman.com/advanced_materials and download the Technical Data Sheets which are of interest or contact us at advanced_materials@huntsman.com

Cold to hot curing matrix systems • Wet lay-up, RTM (follows)

Product designation	Pot Life	Gel Time	Recommended Cure Schedule	Tg	Flexural Strength	Ultimate Flexural Elongation	Fracture properties* K _{1c} G _{1c}
Conditions	RT / 100 ml	80°C		DSC, 10 K/min			
Norm				IEC 1006	ISO 178		
Unit	(min)	(min)	(°C)	(°C)	(MPa)	(%)	(MPa√m) (J/m²)

Pot life < 100 minutes

Araldite® LY 3505 / Aradur® 3405	26-36	5-11	4 hr @ 60 + 6 hr @ 80	87-92	135-155	7.0-9.0	0.80-0.90 150-190
Resin XB 3585 / Aradur® 3405	30-50	4-11	8 hr @ 80	77-82	140-155	9.0-10.5	0.82-0.95 165-185
Resin XB 3585 / Aradur® 5003-1	40-48	6-8	30 min @ 80 + 20 min @ 120	120-130	115-125	6.0-9.0	0.73-0.83 180-230
Araldite® LY 3297 / Aradur® 3299	40-50	10-16	8 hr @ 80	94-100	123-128	9.0-12.0	0.80-0.90 195-225
Araldite® LY 564/ Aradur® 5003-1	42-52	6-8	30 min @80 + 20 min @ 120	108-115	105-115	7.0-9.0	0.90-0.98 240-280
Araldite® LY 3505 / Aradur® 5003-1	42-56	4-7	30 min @ 80 + 2 hr @ 100	110-120	140-150	7.0-8.0	0.90-1.05 210-280
Araldite® LY 3505 / Hardener XB 3404-1	80-100	11-18	4 hr @ 60 + 6 hr @ 80	76-81	125-145	6.5-9.5	0.80-0.95 160-200

Pot life < 200 minutes

Resin XB 3517 / Hardener XB 3419	100-130	22-26	4 hr @ 80	80-86	72-84	2.0-2.6	1.85-2.05 850-1 050
Resin XB 3585 / Hardeer XB 3404-1	100-130	10-20	8 hr @ 80	76-84	128-135	8.0-9.5	0.82-0.92 180-200
Araldite® LY 5052 / Aradur® 5052	110-160	14-17	8 hr @ 80	114-122	116-122	8.5-13.4	0.77-0.83 192-212
Araldite® 3297 / Aradur® 3298	120-135	18-26	8 hr @ 80	90-96	125-130	7.0-8.2	0.85-0.95 215-245
Araldite® LY 1564 / Aradur® 3487	130-160	18-25	8 hr @ 80	81-86	118-130	10.0-12.0	0.95-1.05 255-305

Pot life < 1 000 minutes

Resin XU 3508 / Aradur® 3486	390-480	32-40	5 hr @ 100	95-102	110-125	10.0-12.5	2.20-2.40 1 500-1 700
Resin XB 3585 / Aradur® 3486	480-580	32-40	5 hr @ 100	100-110	120-130	9.0-12.0	0.90-1.02 250-300
Araldite® LY 1564 / Aradur® 3486	560-620	33-43	8 hr @ 80	80-84	118-130	10.5-12.5	0.95-1.05 260-310
Resin XU 3508 / Hardener XB 3403	600-720	30-36	4 hr @ 60 + 6 hr @ 80	70-75	100-125	9.0-11.0	2.10-2.30 1 250-1 400
Araldite® LY 3505 / Hardener XB 3403	600-720	36-48	4 hr @ 60 + 6 hr @ 80	78-83	110-130	10.5-13.0	0.95-1.05 250-280
Resin XB 3585 / Hardener XB 3403	700-950	40-55	8 hr @ 80	79-85	118-132	10.5-12.5	0.90-1.00 240-260

* CG Method PM 258-0/90 (Bend Notch Test) - K_{1c} (MPa√m) : Fracture toughness - G_{1c} (J/m²) : Fracture Energy • RT : Room Temperature = 23±2°C

Hot curing matrix systems • RTM, filament winding, pultrusion

Product designation	Pot Life	Gel Time	Recommended Cure Schedule	Tg	Flexural Strength	Ultimate Flexural Elongation	Fracture properties* K _{1c} G _{1c}
Conditions	RT / 100 ml	80°C		DSC, 10 K/min			
Norm				IEC 1006	ISO 178		
Unit	(min)	(min)	(°C)	(°C)	(MPa)	(%)	(MPa√m) (J/m²)

Pot life < 600 minutes

Resin XU 3508 / Aradur® 22962	90-150	24-40	1 hr @ 80 + 2 hr @ 150	144-154	120-135	8.0-10.0	0.95-1.15 340-380
Araldite® LY 564 / Aradur® 22962	110-150	20-30	15 min @ 120 + 2 hr @ 150	130-140	120-135	9.0-11.0	0.80-0.95 200-260
Araldite® LY 556 / Aradur® 22962	120-180	18-22	15 min @ 120 + 2 hr @ 150	148-155	130-136	7.5-10.0	0.68-0.78 140-175
Resin XB 3585 / Aradur® 22962	110-125	16-20	15 min @ 120 + 2 hr @ 150	150-158	130-140	7.5-9.0	0.65-0.75 130-160
Resin XU 3508 / Aradur® 2954	300-390	36-56	1 hr @ 80 + 8 hr @ 160	150-158	125-135	7.0-8.0	0.85-1.05 250-290
Araldite® LY 564 / Aradur® 2954	480-600	34-45	1 hr @ 80 + 8 hr @ 140	143-148	120-124	6.0-7.5	0.68-0.76 149-181

Hot curing matrix systems • RTM, filament winding, pultrusion (follows)

Product designation	Pot Life	Gel Time	Recommended Cure Schedule	Tg	Flexural Strength	Ultimate Flexural Elongation	Fracture properties* K _{1c} G _{1c}
Conditions	RT / 100 ml	80°C		DSC, 10 K/min			
Norm				IEC 1006	ISO 178		
Unit	(min)	(min)	(°C)	(°C)	(MPa)	(%)	(MPa√m) (J/m²)

Pot life < 2400 minutes

Resin XB 3292 / Aradur® 2954	660-840	34-44	2 hr @ 100 + 2 hr @ 200	220-230	115-125	4.4-4.9	0.53-0.58 75-85
Resin XU 3508 / Hardener XB 3473	1 680-1 980	> 600	1 hr @ 120 + 2 hr @ 200	160-168	110-125	6.0-7.0	1.20-1.40 420-480
Araldite® LY 556 / Hardener XB 3473	1 920-2 220	> 600	2 hr @ 120 + 4 hr @ 180	185-195	110-120	5.5-6.5	0.70-0.85 190-220

Pot life > 2400 minutes

Araldite® LY 564 / Aradur® 917 / Accelerator 960-1	> 2 880	30-40	4 hr @ 80 + 4 hr @ 120	122-128	140-150	6.0-7.0	0.59-0.70 100-125
Resin XU 3508 / Aradur® 917 / Accelerator DY 070	> 2 880	128-160	4 hr @ 80 + 8 hr @ 140	135-145	140-150	5.7-6.7	0.85-0.95 210-240
Araldite® LY 556 / Aradur® 917 / Accelerator DY 070	> 2 880	140-160	4 hr @ 80 + 8 hr @ 140	145-153	125-135	6.0-8.5	0.56-0.60 88-96
Araldite® LY 556 / Aradur® 906 / Accelerator DY 070	> 2 880	224-256	2 hr @ 120 + 8 hr @ 160	160-165	100-140	4.0-7.0	0.60-0.75 100-125
Araldite® CY 179 MA / Aradur® 917 / Accelerator DY 070	> 2 880	120-160	2 hr @ 120 + 8 hr @ 160	188-193	80-105	2.3-3.6	0.50-0.54 72-84
Resin XB 3292 / Hardener XB 3473	> 2 880	360-420	2 hr @ 100 + 2 hr @ 200	195-203	98-108	4.1-4.6	0.50-0.55 70-75
Resin XB 3563 / Aradur® 917 / Accelerator DY 070	> 3 000	120-160	1 hr @ 100 + 6 hr @ 180	198-206	90-110	2.8-4.5	0.45-0.50 60-65

* CG Method PM 258-0/90 (Bend Notch Test) • K_{1c} (MPa√m) : Fracture toughness - G_{1c} (J/m²) : Fracture Energy • RT : Room Temperature = 23±2°C

Matrix systems for prepregging

Product designation	B-Staging	Shelf Life	Recommended Cure Schedule	Tg	Comments
Conditions		RT		DSC, 10 K/min	
Norm				IEC 1006	
Unit			(°C)	(°C)	

Araldite® LZ 5021 / Aradur® 5021	solvent evaporation (3 min @ 140°C)	9-12 months	25 min @ 125	120-125	Multi-purpose high elongation resin system, for solvent prepregging, very long prepreg shelf life
Araldite® LY 556 / Aradur® 5021 / Hardener XB 3403	24 hr @ RT	> 6 weeks	8 hr @ 90	102-108	Easy B-staging
Araldite® LY 556 / Aradur® 5021 / Hardener XB 3471	3 min @ 80-90°C	> 3 weeks	6 hr @ 100	116-122	Sharp B-staging
Araldite® LY 5150 / Aradur® 5021 / Hardener XB 3471	3 min @ 80-90°C	6-8 weeks	1 hr @ 130	135-145	High Tg prepreg
Resin XU 3508 / Aradur® 5021 / Hardener XB 3403	24 hr @ RT	> 6 weeks	10 hr @ 90	100-110	Toughened prepreg with easy B-staging
Resin XU 3508 / Aradur® 5021 / Hardener XB 3471	3 min @ 80-90°C	> 3 weeks	10 hr @ 90	110-120	Toughened prepreg with sharp B-staging

RT : Room Temperature = 23±2°C