

We see a better world

We focus on developing products and solutions to solve new challenges, such as global demand for alternative energy. We enable our customers to be active in green technologies and introduce new eco-friendly processes as well as alternative materials to help reduce carbon footprint and preserve resources. By leveraging our core competencies, which include synthesis and formulation, testing and analysis, process manufacturing technology and technical service, we can develop sustainable products that benefit our customers, consumers and planet as a whole.

Huntsman Advanced Materials

We are a leading global supplier of synthetic and formulated polymer systems for customers requiring high-performance materials which outperform the properties, functionality and durability of traditional materials. Over 2200 associates at 13 locations worldwide, work to fulfill this promise day by day.

More than 9000 companies around the world use Huntsman Advanced Materials technologies in key markets such as adhesives and inks, aerospace, automotive, coatings, construction, electronics, medical, marine, power transmission and distribution, sports equipment and wind power generation.

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Wind power industry selector guide

Advanced Materials solutions

Araldite® RenPaste® RenShape®



The power of excellence

We are your partner of choice, embracing your vision and sharing your challenges as we progress towards a greener future together.

Shared challenges

We have a strong worldwide network working with regional development centers to support cross-national developments. Our regional headquarters allow us to act quickly, work flexibly, focus on local needs, and be cooperative. We work closely with suppliers and we network with market influencers to identify of the required technology of tomorrow. We look forward to offering you total solutions that fit your business.

Powerful partnership

We're determined to not only understand your business and your interests, but also to embrace your vision, serve your needs, and solve your problems. We would like to partner with you and share knowledge in order to improve your productivity, maximize your returns, and help you succeed. We are the best choice of partners.

Dedicated sustainability

We will build a deep understanding of your needs so that we can use our knowledge to meet and exceed your expectations. We are passionate and committed to building lasting relationships of mutual benefit to sustain and progress towards a greener future.

Diverse people

Our people are from diverse backgrounds. They are curious and perseverant, enthusiastic and energetic, and continually seeking new technological and green solutions to create advanced materials for you.



> Assembly of load bearing

Product	Description	Mix ratio (pbv)	Pot life	Recommended cure schedule	LSS*	Typical cured Tg**	Gap filling	Key features
Conditions			23°C, 500 g					
Unit			min		MPa	°C	mm	
Araldite® 2015	EP system GL approved	1:1	45-60	Ambient cure or 4h at 60°C	15-18	67-80	10	Bonding of lightning conductor, monitor sensors, ideal for dissimilar substrates
Araldite® AV 138M-1 / Hardener HV 998	EP system	100:40	40-55	Ambient cure or 4h at 60°C	15-18	79-85	5	Tip control shaft and vibration damper bonding
Araldite® AV 4076-1 / Hardener HV 5309-1	EP system GL approved	1:1	50-65	Ambient cure or 4h at 60°C	20-24	67-80	5-10	Steel insert bonding
Araldite® AW 5047-1 / Hardener HW 5067	EP system	100:45	65-80	1h at 80°C	20-22	70-80	< 0.5	Liquid system for vertical bolt and aluminium end ring bonding, temperature resistant
Araldite® AW 4510 / Hardener HW 4511	EP system	2:1	85-100	2h at 110°C	14-16	110-125	10	High temperature application

* On epoxy composite – LLS = Lap Shear Strength ** Cured in standard blade cycle after initial fixing of shear webs at 25°C, IEC 1006, DSC, 10 K / min

Fast assembly and repair

Product	Description	Repair			Mix ratio	Pot life	Recommended cure schedule	LSS*	Typical cured Tg**	Gap filling	Key features
		Plugs	Composite modules	Blades							
Conditions						23°C, 100g					
Unit					pbv	min		MPa	°C	mm	
Araldite® 2021	MMA system	o	o	o	1:1	3-7	1h at ambient cure	20-22	65-80	3-5	Very fast setting, tough adhesive for rapid fixing and filling of small voids
Araldite® 2022	MMA system	o	o	o	1:1	8-15	2h at ambient cure	20-22	65-80	3-5	Medium open time and fast curing tough adhesive for field/workshop operations
Araldite® 2047	MMA system	o	o	o	10:1	8-15	2h at ambient cure	10-14	70-80	3-5	Rapid attachment of parts, multipurpose adhesive, ideal for dissimilar substrates
Araldite® 2048	MMA system	o	o		10:1	6-12	1h at ambient cure	20-22	65-75	5-8	Rapid attachment of parts, high flexibility and gap filling adhesive
Arathane® 4497 PO / Arathane® 3304 IS	PU system	o	o	o	100:52	8-15	2h at 60°C	15-18	40-50	3-5	Fast setting, filling holes
Araldite® 2029	PU system	o	o	o	1:1	40	12h at ambient cure 1h at 60°C	20-24	25-35	3-5	Long open time adhesive, filling holes
Araldite® LY 1564 / XB 3458	EP system			o	100:20	13-17	7days at 23°C 15min at 80°C	n/a	58-66 88-96	n/a	Wet lay-up repair process, good toughness resistance
Araldite® LY 3297 / Aradur® 3298	EP system			o	100:40	120-135	7days at 23°C 1day at 23°C + 4h at 90°C	n/a	54-59 92-98	n/a	Wet lay-up repair process, longer handling time
Araldite® LY 3297 / Aradur® 3299	EP system			o	100:40	40-50	7days at 23°C 1day at 23°C + 4h at 90°C	n/a	54-59 99-105	n/a	
Agomet® F347 / Hardener D	MMA system	o	o	o	100:10	20	for 7 days at 23°C	~14	-	n/a	High setting rate at room temperature

* On aluminium – LLS = Lap Shear Strength • ** Cured in standard blade cycle after initial fixing of shear webs at 25°C, IEC 1006, DSC, 10 K / min

Araldite®

Reliable and comprehensive **adhesives** solutions

Wind blade **assembly and repair**



High performance solutions for wind turbine industry

Blade assembly

Product	Description	Mix ratio (pbv)	Pot life	Recommended cure schedule	LSS*	Typical cured Tg**	Key features
Conditions			23°C, 500 g				
Unit			min		MPa	°C	
Araldite® AW 4856 / Hardener HW 4856	EP system GL approved	100:50	240-280	5h at 70°C	22-25	73-79	Low exotherm, low shrinkage, high fracture toughness resistance
Araldite® AW 4856 / Hardener HW 4856 fast	EP system	100:50	40-60	5h at 70°C	22-25	73-79	Fast handling
Araldite® AW 4871 / Hardener HW 4871	EP system	100:46	200-260	5h at 70°C	22-25	69-75	High fracture toughness resistance, easy pumping
Araldite® AW 4870 / Hardener HW 4870	EP system	100:50	50-55	5h at 70°C	27-29	72-78	Easy pumping, fast handling
Arathane® 3427 PO / Arathane® 3304 IS	PU system	100:45	100-120 (100g)	2h at 60°C	10-12	40-50	For spare assembly

* On epoxy composite – LLS = Lap Shear Strength

** Cured in standard blade cycle after initial fixing of shear webs at 25°C, IEC 1006, DSC, 10 K / min

Assembly of load bearing >

Product	Description	Mix ratio (pbv)	Pot life	Recommended cure schedule	LSS*	Typical cured Tg**	Gap filling	Key features
Conditions			23°C 500 g					
Unit			min		MPa	°C	mm	
Araldite® 2014-1	EP system	2:1	50-65	Ambient cure or 4h at 60°C	15-18	79-85	5	Bonding tip, control shaft components, high temperature and chemical resistance, ideal for metals

Araldite® RenPaste® RenShape®

The original brands serving worldwide wind industry for more than a decade.

Designed to operate under demanding conditions

Wind is the world's fastest-growing energy source and will power industry and businesses with clean, renewable electricity. Today, the design of wind turbines are becoming larger and increasingly sophisticated, to operate under highly demanding conditions in locations offshore and in cold and/or warm climates.

Huntsman Advanced Materials is passionate in improving quality of life for people around the world. Since more than a decade, the company focused on supporting the green energy value chain. The Research and Development as well as technical support teams have worked close with the industry and all major wind energy equipment manufacturers to develop the advanced technology that improve strength / weight ratios and fatigue requirements. Nowadays, the company has all the right technologies and high performance products that the industry requires.

Blade pre-production to generation, transmission and distribution of energy

From mold to blade production, we offer the added value of combined application expertise, understanding of the whole manufacturing process and products ranging from tooling materials for making plugs and patterns.

Composite resins include the comprehensive standard product range, as well as custom materials formulated to answer specific project requirements.

Adhesives for wind turbine assembly, ancillary bonding applications and field repair are available.

Last but not the least, Huntsman Advanced materials also supports the power generation, transmission and distribution of the wind energy industry. The systems can be applied in a lot of insulation components of wind power electricity networks.

Versatile product ranges of Advanced Materials solutions

RenShape® modeling boards and tooling boards

- > Low coefficient of thermal expansion for enhanced dimensional stability over a broad range of temperatures

RenPaste® modeling paste and seamless modeling paste

- > Easy milling with CNC machines
- > High surface quality
- > Cost effective
- > Low exothermic product with rapid cure, low shrinkage, excellent dimensional stability and excellent adhesion to (without pretreated) EPS is available

Araldite® and RenLam® backing layer

- > Good heat resistance up to 180°C
- > Easy to apply by wet lay-up and infusion
- > Good wetting properties with fibres

RenGel® surface coating

- > Easy to mix and brush
- > Thixotropic surface coat features excellent hand-up properties and impact resistance.
- > Heat resistance up to 180°C
- > Can be polished gelcoat is available, excellent surface quality after polishing

Araldite® and Aradur® matrix systems suitable for various processes

- > Wet lay-up follow up vacuum bagging
- > Infusion,
- > Filament winding
- > Prepreg

Araldite® adhesives suitable for

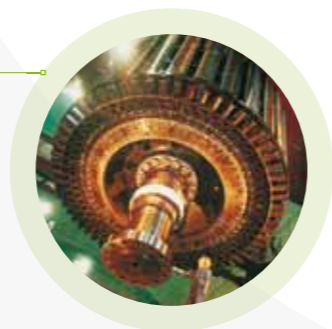
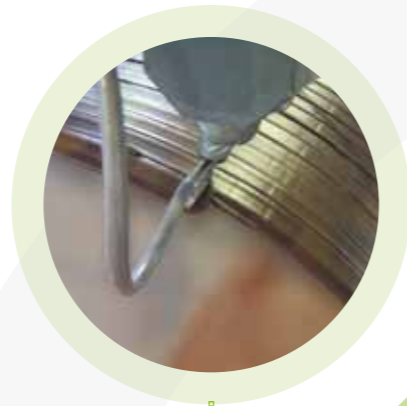
- > Blade assembly
- > Assembly of load bearing components
- > Maintenance and repairing

Product profile of Araldite® adhesives are included Epoxy-, MMA- and PU-based. Toughened adhesives are available.

Araldite® casting systems have supported the electrical industry for more than 60 years. The systems are suitable for insulating

- > Motors and generators
- > Switchgears
- > Instrument transformers
- > Distribution transformers
- > Insulators and Bushings
- > Composite insulator rods and tubes
- > Composite insulator sheds

For detail, please refer to Power Selector Guide



With wet lay-up and vacuum bagging process

Product	Pot life	Mix Viscosity	Glass transition temperature	Flexural strength*	Ultimate flexural elongation*	Key features
Conditions	100 ml	25°C	DSC, 10 K / min	25°C	25°C	
Test method			IEC 1006	ISO 178	ISO 178	
Unit	min (temperature)	mPa.s	°C	MPa	%	
Araldite® LY 3505 / XB 3403	600-720 (RT)	300-400	78-83*	110-130	10.5-13.0	Reactivity can be adjusted on demand
Araldite® LY 3505 / XB 3404-1	80-100 (23°C)	550-800	76-81*	125-145	6.5-9.5	
Araldite® LY 3505 / Aradur® 3405	26-36 (RT)	1 000-1 200	87-92*	135-155	7.0-9.0	
Araldite® LY 1556 / Hardener XB 3461	320-360 (28°C)	800-1 100	80-86*	120-130	8.5-10.5	Long pot life facilitates the large parts production
Araldite® LY 1556 / Aradur® 3405	40-50 (RT)	1 500-1 800	92-98*	130-145	9.0-11.0	Higher viscosity for vertical application

* Cure schedule 4h at 60°C + 6h at 80°C ** Cure schedule 8h at 80°C Note: Further systems are available upon request

With prepreg process

Product	B-staging	Shelf life	Glass transition temperature*	Flexural strength*	Ultimate flexural elongation*	Description
Conditions	RT / 100 ml	23 °C	DSC, 10 K / min	25°C	25°C	
Norm			IEC 1006	ISO 178	ISO 178	
Unit	Time / °C	mPa.s	°C	MPa	%	
Araldite® LY 1556 / Aradur® 1571 / Accelerator 1573 / XB 3403	24h / 23	> 6 weeks	105-115	125-140	7.0-10.0	Easy B-staging
XU 3508 / Aradur® 1571 / Accelerator 1573 / XB 3403	24h / 23	> 1 month	116-125	110-120	5.5-8.0	Toughened prepreg with easy B-staging

* Cure schedule 2-4h at 120°C

With filament winding process

Product	Pot life	Mix Viscosity	Glass transition temperature*	Flexural strength*	Ultimate flexural elongation*	Key features
Conditions	RT / 100ml	25°C	DSC, 10 K / min	25°C	25°C	
Test method			IEC 1006	ISO 178	ISO 178	
Unit	min	mPa.s	°C	MPa	%	
Araldite® LY 1135-1 A / Aradur® 917 / Accelerator DY 070	95-115	600-900	143-150	130-150	7.0-8.5	High Tg for winded parts

* Cure schedule 4h at 80°C + 8h at 140°C

Araldite®

Reliable and comprehensive **composite resin** systems
Germanische Lloyd (GL) approved

Wind blade **production**

RenShape® RenPaste®

Reliable and comprehensive **tooling** systems

Wind blade **pre-production**

With infusion process

Product	Pot life	Mix Viscosity	Glass transition temperature*	Flexural strength*	Ultimate flexural elongation*	Key features
Conditions	RT / 100 ml	25°C	DSC, 10 K / min	25°C	25°C	
Test method			IEC 1006	ISO 178	ISO 178	
Unit	min	mPa·s	°C	MPa	%	
Araldite® LY 1564 / Aradur® 3486 or Aradur® 3486 Blue	560-620	200-300	80-84	118-130	10.5-12.5	High toughness
Araldite® LY 1564 / Aradur® 3416	290-340	200-320	80-85	118-130	10.0-12.0	
Araldite® LY 1564 / Aradur® 3487	130-160	220-320	81-86	118-130	10.0-12.0	
Araldite® LY 1568 / Aradur® 3489	850-950	200-300	77-80	120-130	9.0-10.0	Low exotherm
Araldite® LY 1568 / Aradur® 3491	750-850	200-300	74-80	120-130	9.0-10.0	
Araldite® LY 1568 / Aradur® 3492	300-350	250-350	80-85	125-135	7.0-7.5	
Araldite® LY 1572 / Aradur® 3486 Blue	-	200-300	80-86	100-120	8.5-11.0	High toughness

* Cure schedule 8h at 80°C

Master model / plug

Product	Color	Minimum cure schedule	Density	Shore hardness D	Coefficient of thermal expansion	Deflection temperature	Compressive strength	Flexural strength
Test method				ISO 868	ISO 11359	ISO 75	ISO 604	ISO 178
Unit			g / cm ³		10 ⁻⁶ K ⁻¹	°C	MPa	MPa

Seamless modeling pastes

XH 6403 A / XH 6405-1 B	Orange	4h at 25°C	0.9-1.0	65	-	-	33 (16h at 40°C)	16 (16h at 40°C)
RenShape® 460	Light brown	n.a.	0.77	64	53.8	-	15.2	-
XW 5129 / XW 5130	Brown	25-30 min mainly use as repair filler	0.7	60-65	-	-	-	-
RenPaste® SV 4503-1 / Ren® HV 4503-1	Brown	Machinable after 1 day (RT* cure)	0.75-0.8	55-60	101 (3 days at RT*)	42 (3 days at RT*) 54 (8h at 80°C)	11.5 (3 days at RT*)	11 (3 days at RT*)
RenPaste® 4666 Resin / Ren® 4666 Hardener	Light grey	Machinable after 1 day (RT* cure)	0.95-1.0	60-65	75-80 (7 days at RT*)	52 (7 days at RT*) 72 (RT* cure + 8h at 60°C) 82 (RT* cure + 8h at 80°C)	20 (7 days at RT*)	19 (7 days at RT*)

* Room temperature 23°C
Note: Machine applied

Mould production with infusion and wet lay-up processes (heat resistance up to 120°C)

Product	Color	Pot life	Gel time thin layer	Density	Shore hardness D	Deflection temperature
Conditions		25°C, 250 ml	23°C			
Test method					ISO 868	ISO 75
Unit		min	min	g / cm ³		°C

Surface coat

XD 4615 / Ren® HY 5159	Black	25-30	60-70	1.3	80-90	120
XD 4623 / Ren® HY 5159	Green	30	60-70	1.16	80-85	120
RenGel® SW 5200 / Ren® HY 5158	Black	120	-	1.6	90	160-170

Coupling layer

RenGel® P99 / Ren® HY 5159	Grey	30	120-130	1.5	90	120
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Product	Color	Viscosity	Pot life	Density	Cure cycle	Tg	Flexural strength	Process
Conditions		25°C	100 ml					
Test method							ISO 178	
Unit		mPa·s	min	g / cm ³		°C	MPa	

Back construction

RenLam® LY 113 / Ren® HY 98	Clear to pale yellow	300	90-100 (500 ml)	1.1	8h at 60°C + 4h at 120°C	125	100-110	Wet lay-up / Infusion
Araldite® LY 564 / Aradur® 22962	Clear	400-600	110-150	1.1	4h at 80°C 1h at 80°C + 2h at 150°C	100-110 128-138	124-132	Infusion
Araldite® LY 564 / Aradur® 2954	Clear	500-700	480-600	1.1	4h at 80°C 1h at 80°C + 8h at 140°C	99-105 143-148	120-124	Infusion
RenLam® LY 5210 / Ren® HY 5158	Yellowish	3 000	150 (500ml)	-	3-4 days RT / 14h at 40°C	-	-	Wet lay-up

Mould production with infusion and wet lay-up processes (heat resistance up to 180°C)

Product	Color	Pot life	Density	Shore hardness D	Demoulding time	Cure Cycle	Tg
Conditions		25°C					
Test method				ISO 868			
Unit		h	g / cm ³		h		°C

Surface coat

RenGel® SW 5200 / Ren® HY 5212	Black	10 (500ml)	1.5	90	14 at 40-50 °C	12h at 40°C + 2h at 80°C + 2h at 100°C + 2h at 120°C + 2h at 140°C + 2h at 160°C + 2h at 180°C + 12h at 200°C	200
RenGel® SW 5200 / Ren® HY 5213	Black	4.5 (250ml)	1.6	90	14 at 40-50 °C	12h at 40°C + 2h at 80°C + 2h at 100°C + 2h at 120°C + 2h at 140°C + 2h at 160°C + 12h at 180°C	170-180

Product	Color	Viscosity	Pot life	Density	Demoulding time	Cure Cycle	Tg	Flexural strength
Conditions		25°C	25°C, 500ml					
Norm								ISO 178
Unit		mPa·s	h	g / cm ³	h		°C	MPa

Back construction

RenLam® LY 5210 / Ren® HY 5212	Amber	2 000	12	1.1	14 at 40-50°C	12h at 40°C + 2h at 80°C + 2h at 100°C + 2h at 120°C + 2h at 140°C + 2h at 160°C + 2h at 180°C + 12h at 200°C	230-238	88
RenLam® LY 5210 / Ren® HY 5213	Amber	1 800	2-2.5	1.1	14 at 40-50°C	12h at 40°C + 2h at 80°C + 2h at 100°C + 2h at 120°C + 2h at 140°C + 2h at 160°C + 2h at 180°C	170-180	126
Araldite® LY 8615 / Aradur® 8615	Amber	550	18 (100 ml)	1.1	24 at 40°C	24h at 40°C + 2h at 60°C + 2h at 80°C + 2h at 100°C + 2h at 120°C + 2h at 140°C + 2h at 160°C + 6h at 180°C	ca.220	ca.100

Mould releasing agent for mould production

Product	Color	Viscosity	Temperature resistance
Conditions		23°C	
RenLease® QV 5110	Colorless	Paste	up to 130°C
RenLease® QZ 5111	Colorless	Dynamic: 5 mPa·s	up to 84°C
Mould Release QZ 13	Colorless	Dynamic: 4 mPa·s	up to 200°C