



Araldite®

Composite Bonding

HUNTSMAN

	Features	Adhesive	Araldite 2000 designation	Colour ¹⁾	Mix ratio by volume
Epoxyies	Rapid curing, multi-purpose adhesive	AW 2104/HW 2934	Araldite 2012	pale yellow	1:1
	Fast curing, good oil and petrol resistance	AW 2101/HW 2951	-	grey	1:1
	Fast curing, tough and resilient	XD 4443/XD 4444	Araldite 2010	pale yellow	1:1
	Long open time, good temperature resistance, excellent resistance to water and a wide variety of chemicals	AW 139/XB 5323	Araldite 2014	grey	2:1
	Long open time, toughened, impact resistant and highly gap filling	AV 5308/HV 5309-1	Araldite 2015	beige	1:1
	Long open time, highly gap filling, toughened and lower modulus, impact resistant and good environmental resistance	AV 4076-1/HV 5309-1	-	opaque	1:1
	Long open time, extremely tough, impact resistant with good environmental resistance, numerous aerospace approvals	Araldite 420 A/B	-	dark green	2:1
	Long open time, toughened, impact resistant and good environmental resistance	AV 4076-1/HY 4076	-	opaque	2:1
	After warm cure (>40°C) extremely tough and resilient with excellent environmental and temperature resistance	Epibond 1590 A/B	-	beige	3:2
	Excellent environmental, chemical and temperature resistance after warm cure at 100°C - 120°C	XD 4510/XD 4511	-	dark grey	2:1
	Heat curing >120°C, one component, toughened with an excellent temperature resistance	AV 119	-	beige	-

Polyurethanes	Fast curing, specially suitable for primerless SMC bonding, highly gap filling	XD 4712/XD 4713	Araldite 2027	beige	1:1
	Excellent for bonding selected thermoplastic composites with minimal surface preparation, self extinguishing	Uralane 5774 A/C	-	brown	2:1
	Long open time, high modulus, for bonding rigid composite components, highly gap filling	XD 4527/XB 5304	-	beige	100:45

Methacrylates	Rapid curing, toughened and impact resistant with an excellent combination of high flexibility and high strength	XD 4661 A/B	Araldite 2021	yellow	1:1
	Rapid curing, toughened and impact resistant, especially for use in dynamic environments, tolerant to paint baking temperatures after curing	XD 4666 A/B	Araldite 2024	blue	10:1
	Fast curing, toughened and impact resistant with a good chemical resistance	XD 4662 A/B	Araldite 2022	yellow	1:1
	Fast curing, white, colour stable, good environmental and UV resistance	XD 4665 A/B	-	white	10:1

Cure at room temperature unless: For best joint properties, curing at temperatures above 40 - 60°C is recommended
 Heat curing at temperatures above 120°C

Viscosity ¹⁾ gap filling capability	Pot life 100g at 23°C	Open time at 23°C/65%/rh	Typical curing time at 23°C to reach handling strength ²⁾	Typical curing time at 23°C to reach near to full strength ³⁾	Typical bulk properties			Typical Tg value ⁴⁾ / max. temperature in °C for 25% of LSS at 23°C	Typical lap shear strength on o materials at 23°C in MPa		
					Tensile strength at 23°C in MPa	Tensile modulus at 23°C in MPa	Tensile elongation at 23°C in %		SMC ⁵⁾	GRP ⁶⁾	GRE ⁶⁾
30 Pas 0-0.5mm	4 mins	5 mins	20 mins	48 hours	60	2500	8	40/80	-	6*	8
thixotropic 0-4mm	8 mins	5 mins	25 mins	48 hours	25	3500	2	45/100	8*	6*	14
80 Pas 0-2mm	8 mins	8 mins	30 mins	48 hours	32	2350	4	40/70	8	7*	10
thixotropic 0-4mm	40 mins	30 mins	3.5 hours	48 hours	26	4000	0.7	85/130	8*	7*	14*
thixotropic 0-10mm	40 mins	20 mins	4 hours	48 hours	26	2000	3	65/100	9*	6*	14*
thixotropic 0-10mm	60 mins	30 mins	4.5 hours	48 hours	23	1150	5	80/110	8*	7*	14*
40 Pas 0-2mm	60 mins	45 mins	5 hours	3 days	32	1900	4	40/60	8*	6*	24*
40 Pas 0-3mm	60 mins	45 mins	6 hours	3 days	30	1500	5	55/70	7	7*	23*
thixotropic 0-2mm	20 mins	60 mins	6 hours	⁹⁾	35	1500	5	80/140	8*	6*	18*
thixotropic 0-6mm	90 mins	15 mins	15 mins at 60°C	⁹⁾	44	5000	0.8	130/180	6	7*	17*
thixotropic 0-5mm	-	28 days	-	30 mins at 150°C	51	2500	1.6	100/140	-	6*	14
thixotropic 0-10mm	10 mins	8 mins	90 mins	3 days	13	850	15	15/80	9*	7*	9
thixotropic 0-2mm	25 mins	30 mins	2 hours	4 days	10	400	40	15/70	7	8*	13*
thixotropic 0-30mm	2 hours	60 mins	4 hours	3 days	30	2500	5	50/80	9*	4	12*
45 Pas 0-4mm	3 mins	3 mins	8 mins	12 hours	24	1000	50	65/110	5	6*	9
45 Pas 0-6mm	4 mins	6 mins	12 mins	12 hours	18	600	110	25/120	6	6*	11
60 Pas 0-4mm	10 mins	6 mins	20 mins	12 hours	30	1100	50	40/85	8*	7*	12*
thixotropic 0-5mm	20 mins	10 mins	25 mins	12 hours	13	300	100	20/80	7*	8*	9

¹⁾ of mixed adhesive

²⁾ for LSS >1 MPa
(LSS = lap shear strength)

³⁾ >90% of final strength

⁴⁾ the glass transition temperature Tg is the maximum temperature up
to which the modulus and strength are not significantly reduced

⁵⁾ cleaned

⁶⁾ abraded

Composite Pa		Typical lap shear strength on aluminium at 23°C in MPa	Typical peel strength on aluminium at 23°C in N/mm	Impact resistance	Durability			Suitability for bonding composite materials to			Data sheet ref.
	CFRP ⁷⁾				Water/humidity resistance	Chemical resistance	Temperature resistance	Composite materials	Metals	Engineering thermoplastics ⁸⁾	
	-	19	5.5								A231
	-	20	4.5								A312
	-	23	7.8								A279
	16	19	3								A233
	18	18	4.5								A234
	20	24	4								A349
	36	35	7								A161
	31	28	7.5								A72
	36	38	9								A446
	22	17	1.5								A393
	-	30	8								A314

	-	14	8								A442
	-	15	5								A202
	-	23	3								A410

	-	22	11								A297
	-	16	4.5								A437
	-	23	4								A298
	-	13	6								A301

⁷⁾ peel-ply

⁹⁾ needs warm post cure

⁸⁾ requires specific pretreatments

* denotes substrate failure

Excellent



Good

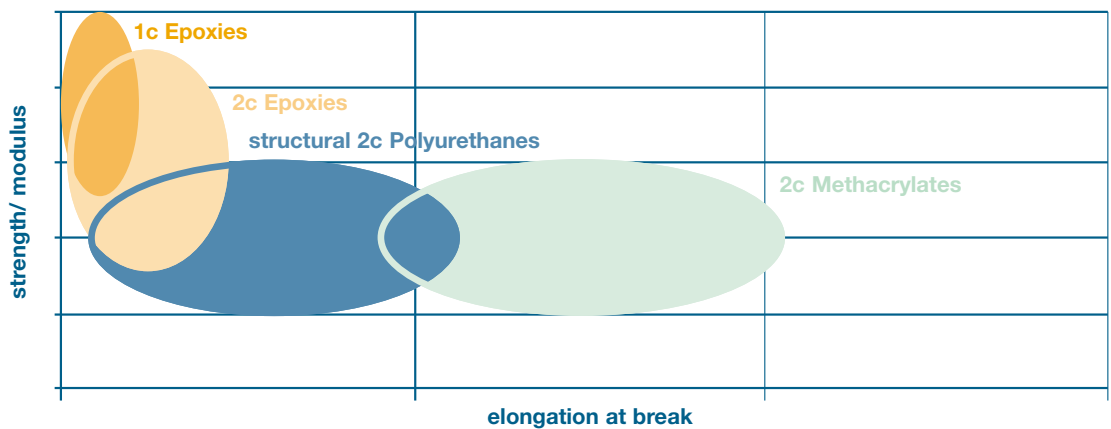


Araldite® Composite Bonding

The **Araldite composite bonding range** offers high performance from the latest epoxy, polyurethane and methacrylate adhesive technology.

Epoxies	Polyurethanes	Methacrylates
<ul style="list-style-type: none"> • excellent adhesion to thermoset composites and to metals • high strength and high stiffness • high creep resistance • high fatigue resistance • excellent chemical resistance and long term durability 	<ul style="list-style-type: none"> • excellent adhesion to most composite materials and plastics • good adhesion to metals • mechanical properties from rigid to flexible • high fatigue resistance • good long term durability 	<ul style="list-style-type: none"> • excellent adhesion to thermoset composites and to most thermoplastics • good adhesion to metals • surface contamination tolerant • high strength combined with high toughness • high fatigue resistance • good chemical resistance • good long term durability • UV stable

The range includes adhesives with highest strength for bonding CFRP or GRE and CFRP/GRE to metals, through to resilient and flexible adhesives for bonding SMC, GRP, composites with thermoplastic matrices and combinations of materials.



From adhesives with long open time for large area applications to fast curing adhesives for early removal of fixtures and rapid through-put, the range includes adhesives which are resistant to high temperatures, water and chemicals, are impact resistant and are thixotropic for gap filling or vertical applications.

The **Araldite composite bonding range** will continuously be updated to meet the newest demands of innovative design with composite materials.

Araldite composite bonding range adhesives are available in a variety of packaging including easy to use dual barrel cartridges with static mixers and manual or pneumatic guns, in working packs, in cans and drums for higher volume applications.

Specialist firms have developed metering, mixing and spreading equipment that enables the bulk processing of adhesives. Huntsman Advanced Materials will be pleased to advise customers on the choice of equipment for their particular needs.

The **Araldite composite bonding range** contains a selection of adhesives to meet the great majority of composite bonding applications. Additionally there are many other Araldite adhesives available which are also suited for composite bonding. More information is available on request.

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Handling Precautions

Caution

Huntsman Advanced Materials products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come in contact with foodstuffs or food utensils, and measures should also be taken to prevent the uncured materials from coming in contact with the skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper towels – not cloth towels – should be used to dry the skin. The work area should be well ventilated. These precautions are described in greater detail in Manual No. 24264/e *Hygienic Precautions for Handling Plastic Products of Huntsman Advanced Materials* and in the Material Safety Data Sheets for the individual products. These publications are available on request and should be referred to for fuller information.

All recommendations for use of our products, whether given by us in writing, verbally, or to be implied from the results of tests carried out by us, are based on the current state of our knowledge. Notwithstanding any such recommendations the Buyer shall remain responsible for satisfying himself that the products as supplied by us are suitable for his intended process or purpose. Since we cannot control the application, use or processing of the products, we cannot accept responsibility therefore. The Buyer shall ensure that the intended use of the products will not infringe any third party's intellectual property rights. We warrant that our products are free from defects in accordance with and subject to our general conditions of supply.

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.

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