



Araldite®

General Purpose Adhesives

High-performance epoxy and polyurethane adhesives for assembly, maintenance and repair

HUNTSMAN

Araldite Adhesives

For more than 60 years, Araldite® structural epoxy adhesives have been preferred by customers throughout the world for tough bonding applications. Today, epoxies manufactured by Huntsman Advanced Materials as well as advanced, high-quality polyurethanes and fast-setting, high-strength methacrylates continue to provide users with outstanding performance along with easy handling and processing.

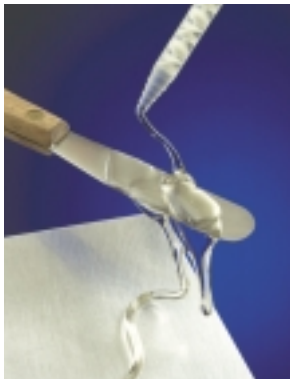
Featuring a comprehensive range of physical properties, Araldite adhesives are well-suited for use on metals including aluminum and steel, rigid and engineering thermoplastics, thermoset plastics and composites, rubber, ceramic, glass and substrate combinations. Among the primary markets for Huntsman's structural adhesives are the transportation (aviation, automotive, mass transit vehicles), recreation, marine, appliance, electrical/electronic equipment and DVD replicating industries. ■



Each family of Araldite structural adhesives has different strengths:

Araldite Epoxies. One- and two-component epoxies are known for their ability to produce ultra-high-strength, rigid bonds on substrates ranging from metals to thermosetting plastics and composites. The systems are formulated with a wide range of viscosities and work lives to meet the processing and handling requirements of most projects. Further benefits of Araldite advanced epoxies are their low shrinkage, excellent chemical and corrosion resistance, high-temperature performance to 350°F (180°C), and good electrical insulating properties.

Araldite Polyurethanes. Two-component polyurethane adhesives generally produce more flexible, resilient bonds than epoxies and are typically the materials of choice for joining tough-to-bond engineering thermoplastics, rigid plastics and composites, and metal-to-plastic



assemblies. Polyurethanes are easy to apply with minimal substrate preparation and offer good sag resistance. They gel and cure quickly at room temperature. Once cured, the adhesives maintain outstanding resilience even at low temperatures and feature good shear strength and high impact resistance.

Packaging. Araldite structural adhesives are supplied in a variety of packaging options. Consult your Huntsman Advanced Materials customer representative for information on available package sizes for specific adhesives.

Araldite and Agomet™ Methacrylates.

High strength and fast cure cycles characterize Huntsman's methacrylate adhesives. Many of the two-component systems are designed for "surface activation" in which a hardener is applied to one substrate up to 30 days before the adhesive/resin is added and the assembly joined. The versatile line of Araldite methacrylates also includes conventional mixable systems and adhesives formulated for meter/mix dispensing. Methacrylates are well-suited for coating small and large areas with work lives ranging from one to 20 minutes. Handling time is from two to 35 minutes at room temperature, and adhesives can be applied from 0.02 to 0.31 inches in thickness. Cured methacrylates exhibit high lap shear strength comparable to epoxies and good tensile strength.

Selection of the best structural adhesive for a bonding project calls for a careful evaluation of criteria including:

Substrates. Consider the type of material to be bonded, its characteristics and any surface preparation needed before adhesive application.

Anticipated Stresses. Determine the joint design and adhesive characteristics required to withstand the load, tensile, shear, compression and peel stresses of the project.

Service Conditions. Analyze the temperature and environmental conditions the assembly must withstand.

Handling/Processing Requirements. Evaluate the work life, fixture time and curing properties of the adhesive in terms of production schedule, dispensing method and fixturing/curing parameters.

For detailed information on recommended bonding techniques, contact Huntsman Advanced Materials for copies of the "User's Guide to Adhesives" and "Surface Preparation and Pretreatment" brochures.

TWO-COMPONENT EPOXY ADHESIVES

Product	Mix Ratio, By Wt./ By Vol.	Viscosity, Components, cP	Mixed Viscosity, cP	Specific Gravity, Components	Pot Life, Min @ 77°F ^a	Handling Strength, ^b Hrs @ 77°F ^a	Minimum Cure Time, ^c Hrs @ 77°F ^a	Min @ 140°F ^a	Min @ 212°F ^a	Lap Shear Strength, ^d psi @ 77°F ^a	psi @ 180°F ^a
LIQUID											
Araldite AY 103/ Hardener HY 991	100:40/ 100:50	1,600 23,000	3,500	1.15 0.93	90 ^a	12	24	120	15	2,500	1,150
Araldite AW 136/ Hardener HY 994	100:40/ 100:55	50,000 1,700	7,500	1.39 0.93	75 ^a	4.5	24	60	10	3,410	2,840
Araldite AW 136/ Hardener HY 5049	100:30/ 100:40	50,000 900	7,500	1.39 0.93	75 ^a	4.5	24	60- 120	15- 20	2,590	1,580
MEDIUM VISCOSITY											
Araldite AW106R Hardener HV 953U (Araldite 2011)	100:80/ 100:100	50,000 35,000	45,000	1.17 0.92	120 ^a	7	12	60	10	2,560 ^b	250
Araldite AY 557/ Hardener HY 557	100:100/ 100:100	14,000 14,000	14,000	1.16 1.14	4 ^a	10 min.	4	NR	NR	2,560	200
TDR 1100-11 Resin/ TDR 1100-11 Hardener	100:42/ 100:50	16,500 38,000	13,000	1.16 0.99	95 ^a	8	24	60	15	4,100	3,200
XD4428 XD4455 (Araldite 2043)	100:100/ 100:100	25,000 15,000	20,000	1.16 1.14	90sec. ^e	5 min.	1	—	—	3,100 ^a	500 ^a
Araldite AW 2104/ Hardener HW 2934 (Araldite 2012)	100:100/ 100:100	35,000 30,000	30,000	1.17 1.17	4 ^a	20 min.	1	10	2	2,400 ^b	500
Araldite AV 8574/ Hardener HV 8574	100:41/ 100:50	75,000 12,000	30,000	1.43 1.18	120 ^a	8	24	60	10	3,400	3,400
Araldite AW 8595/ Hardener HW 8595	100:77/ 100:100	33,000 25,000	21,000	1.23 0.94	60 ^a	4	16	60	10	2,600	900
HIGH VISCOSITY											
Fastweld™ 10 Resin/ Fastweld 10 Hardener	100:100/ 100:100	260,000 160,000	250,000	1.48 1.44	4 ^a	10 min.	4	NR	NR	2,840	220
Araldite AW 139/ Hardener XB 5323 (Araldite 2014)	100:50/ 100:50	55,000 510,000	90,000	1.60 1.60	40 ^a	3.5	6	30	6	2,400 ^b	2,400
Araldite AV 8503/ Hardener HV 8503	100:92/ 100:100	172,500 368,000	250,000	1.32 1.21	30 ^a	3	24	60	5	3,380	2,380
Araldite AV 8531/ Hardener HV 8531	100:187/ 100:200	320,000 304,000	310,000	1.33 1.27	40 ^a	3.5	48	60	5	3,500	2,400
PASTE											
Araldite AV 144-2/ Hardener HV 997 (Araldite 2013)	100:60/ 100:100	75,000 Paste	Paste	1.40 0.90	65 ^a	4	10	40	6	3,000 ^b	700
Araldite AV 1253/ Hardener HV 1253	100:82/ 100:100	Paste Paste	Paste	0.82 0.64	20 ^a	3.5	6	30	10	1,990	140
Araldite AV 1258/ Hardener HV 1258	100:100/ 100:100	Paste Paste	Paste	1.53 1.56	23 ^a	3.5	6	30	10	2,840	330
Araldite XB 5308/ Hardener XB 5309-1 (Araldite 2015)	100:100/ 100:100	Paste Paste	Paste	1.40 1.40	35 ^a	4	10	35	7	3,200	1,050
Araldite AW 8535/ Hardener HW 8535	100:75/ 100:100	Paste Paste	Paste	1.43 1.10	60 ^a	5.5	16	60	10	2,500	890

TEST METHODS

Viscosity: ASTM D-2393
 Specific Gravity: ASTM D-792
 Pot Life: ASTM D-2471
 Lap Shear Strength: ASTM D-1002
 (Tested on aluminum)
 Tg per DMA
 Elongation: ASTM D-638
 Ultimate Tensile Strength: ASTM D-638
 Coefficient of Thermal Expansion: ASTM E-831
 Shore Hardness: ASTM D-2240

* Below Tg
 + 77°F = 25°C; 104°F = 40°C;
 140°F = 60°C; 180°F = 82°C;
 212°F = 100°C; 248°F = 120°C;
 260°F = 130°C; 302°F = 151°C;
 338°F = 170°C; 356°F = 180°C

VISCOSITY IN CENTIPOISE **CONSISTENCY SIMILAR TO**
 1 = Water
 500 = #10 Motor Oil
 2,500 = Pancake Syrup
 10,000 = Honey
 25,000 = Chocolate Syrup
 50,000 = Catsup
 250,000 = Peanut Butter
 >1,000,000 = Paste or Caulking Compound

Tg, °F/°C	Elongation, %	Ultimate Tensile Strength, psi	Coefficient of Thermal Expansion, in/in/°F	Hardness, Shore D	Maximum Service Temp., ⁹ °F/°C	Suggested Applications / Comments
181/83	9	6,200	3.10x10 ⁻⁵	84	140/60	Transparent, low-viscosity adhesive.
164/74	6	6,660	3.89x10 ⁻⁵	85	212/100	Black, high-strength adhesive that cures at 104°F (40°C). Provides good bond strength to 212°F (100°C).
158/70	4	9,600	6.37x10 ⁻⁵	82	212/100	Black, high-strength adhesive that cures at 104°F (40°C). Provides good bond strength to 212°F (100°C).
146/63	9	4,800	4.72x10 ⁻⁵	80	140/60	General-purpose adhesive with good impact and vibration resistance. Bonds metals, ceramic, rubber and plastic.
136/58	7	4,630	4.02x10 ⁻⁵	83	120/50	Clear, fast-setting adhesive for bonding and repairing small parts. Cures at temperatures as low as 41°F (5°C).
185/85	5	9,000	3.73x10 ⁻⁵	85	195/90	Translucent adhesive with high reactivity above 160°F (70°C). Bonds fiberglass, plastics and wood.
136/58	—	—	4.02x10 ⁻⁵	83	120/50	Ultra fast-setting adhesive with good flexibility.
86/30	—	—	3.60x10 ⁻⁵	82	120/50	Fast-curing adhesive that forms strong, tough bonds on metals and rigid plastics.
289/143	2	7,300	2.87x10 ⁻⁵	90	350/180	High-temperature epoxy with long work life and excellent chemical resistance.
191/88	50	2,200	11.80x10 ⁻⁵	72	176/80	Medium-viscosity, translucent adhesive with high flexibility. Bonds well to variety of substrates.
127/53	5	3,850	3.61x10 ⁻⁵	85	140/60	Fast-setting adhesive that cures at temperatures as low as 41°F (5°C). For bonding and repairing small parts.
230/110	1	5,500	3.69x10 ⁻⁵	84	284/140	Electrically insulating adhesive with good resistance to heat, chemicals and corrosion.
208/98	15	3,400	8.30x10 ⁻⁵	78	250/120	Flexible adhesive that fixtures fast at 250°F (120°C). For bonding SMC.
199/93	55	2,000	8.90x10 ⁻⁵	66	194/90	High-flexibility adhesive that fixtures fast at 250°F (120°C). For bonding SMC.
149/65	2	5,000	4.44x10 ⁻⁵	80	149/65	Tough, high-strength adhesive with good chemical resistance and environmental stability. For bonding metals.
146/63	11	2,130	4.24x10 ⁻⁵	73	120/50	Mahogany-colored paste that is easy to sand and hand-carve. For repair and bonding of wood products.
166/74	2	5,600	3.02x10 ⁻⁵	89	140/60	Gap-filling, aluminum-filled paste that is easy to machine. For general-purpose bonding and repair.
181/83	3	3,400	5.27x10 ⁻⁵	75	176/80	Thixotropic, non-sagging adhesive that forms resilient bonds on SMC and FRP.
191/88	29	2,290	14.00x10 ⁻⁵	75	176/80	High-strength, thixotropic paste designed for large gap-filling applications. Convenient 1:1 mix ratio.

NR = Not recommended

a = Tested on SMC

b = Time to achieve 150 psi lap shear strength

c = Time to achieve 1500 psi lap shear strength, in most products

d = At full cure

e = Temperature at which bond maintains 1,000 psi lap shear strength, in most products

f = After elevated-temperature cure

g = At 140°F

h = At 260°F

i = At 338°F

¹ 2 fluid ounce sample

² 4 fluid ounce sample

³ 50 gram sample

⁴ 100 gram sample

⁵ 70 gram sample

⁶ 2 gram sample

A = After 16-hour cure @ 104°F on aluminum.

B = After 7-day cure @ 77°F on aluminum.

TWO-COMPONENT POLYURETHANE ADHESIVES

Product	Mix Ratio, By Wt./ By Vol.	Viscosity, Components, cP	Mixed Viscosity, cP	Specific Gravity, Components	Pot Life, Min @ 77°F ^a	Handling Strength, ^b Hrs @ 77°F ^a	Minimum Cure Time, ^c			Lap Shear Strength, ^d	
							Hrs @ 77°F ^a	Min @ 140°F ^a	Min @ 212°F ^a	psi @ 77°F ^a	psi @ 180°F ^a
XD 4700 Resin/ Hardener XD 4710 (Araldite 2026)	100:100/ 100:100	15,000 9,000	10,000	1.10 1.10	3-4 ²	1	8	30	12	2,900	450
XD 4712 Resin/ Hardener XD 4713 (Araldite 2027)	100:97/ 100:100	18,000 20,000	Paste	1.50 1.45	8-10 ²	1.5	8.5	20	14	2,000	600
Araldite AW 8621/ Hardener HW 8621-4	70:100/ 85:100	1,500 25-30,000	—	1.12 1.35	5.0-6.5 ⁴	1	12	60	—	2,900	65
Araldite AY 8650/ Hardener 5090-1	100:500/ 100:400	200 20,000	6,000	1.24 1.64	70-90 ⁴	—	24	180	30	2,300	750 ⁹
Araldite AY 8650/ Hardener HY 8650	100:50/ 100:40	200 20,000	5,000	1.24 1.64	8-10	4	24	3	30	2,000	600
Araldite AW 8680/ Hardener HW 5541 (Araldite 2041)	80:100/ 100:100	50,000 20,000	50,000	1.10 1.30	15 ²	4	16	120	10	1,450	600
Araldite AW 8680/ Hardener HW 5542 (Araldite 2042)	80:100/ 100:100	50,000 20,000	50,000	1.10 1.30	3 ²	1	6	60	10	1,450	600
Araldite AW 8680/ Hardener HW 8680 (Araldite 2040)	93:100/ 100:100	48,000 50,000	50,000	1.14 1.23	15 ⁴	10	48	120	30	1,700	380
Araldite AW 8680/ Hardener HW 8685	80:100/ 100:100	50,000 20,000	50,000	1.10 1.30	8	2	12	90	10	2,800	600

ONE-COMPONENT EPOXY ADHESIVES

Product	Mix Ratio,	Viscosity, cP	Specific Gravity	Minimum Cure Time, ^c			Lap Shear Strength, ^f	
				Min @ 248°F ^a	Min @ 302°F ^a	Min @ 356°F ^a	psi @ 77°F ^a	psi @ 180°F ^a
Araldite AV 118	One-component	90,000	1.13	45	30	10	4,000	3,300
Araldite AV 119	One-component	Paste	1.18	60	30	10	4,250	3,500
Araldite AV 4600	One-component	Paste	1.28	—	15 +	15	3,300	3,100
Araldite AV 8551	One-component	210,000	1.29	45	15	5	2,900	2,300
Araldite AV 8553	One-component	210,000	1.35	30 ^h	20 ⁱ	15	3,700	—

METHACRYLATE ADHESIVES

Product	MIX/NO- MIX/A/B ^c	Viscosity, Resin (Hardener), cP	Viscosity, Mixed, cP	Specific Gravity, Resin (Hardener)	Pot Life, Min @ 77°F ^a	Handling Strength, ^b Min @ 77°F ^a	Gap Filling, in (mm)	Cure Time, Hrs @ 77°F ^a	Lap Shear Strength, ^d psi, al/al, @ 77°F ^a
Agomet 300	No-Mix + A/B	—	22,000	1.2	1-2	3-6	0.03-0.16 (0.08-4)	2	3,400
Agomet 305	No-Mix + A/B	—	4,000	1.0	1-2	3-5	0.03-0.04 (0.08-1)	2	3,500
Agomet 310	Mix + No-Mix + A/B	—	22,000	1.0	8-12	20	0.03-0.31 (0.08-8)	12	4,000
XD4661 (Araldite 2021)	A/B	45,000 (40,000)	45,000	1.03 (0.96)	2-3	8	0.03-0.16 (0.08-4)	18 min.	3,625
XD4662 (Araldite 2022)	A/B	70,000 (45,000)	60,000	1.03 (1.00)	10	18	0.12-0.18 (3.0-4.5)	30 min.	3,050
XD4666 (Araldite 2024)	A/B	120,000 (60,000)	110,000	0.96 (1.07)	4-5	10	0.25-0.35 (6.3-9.0)	15 min.	2,650

C = See Technical Data Sheet for mixing details. The selected Agomet methacrylates are three of a series of mix, no-mix and meter/mix dispensable systems. **Mixing Systems** are designed for powder, paste or hardener to be blended with adhesive as with conventional adhesives. **No-mix Systems** are designed for a hardener lacquer or spray to be applied on one work surface up to 30 days before adhesive is added to the second surface and the pieces joined and bonded. **A/B Systems** are designed for meter/mix dispensing and comprise adhesive + a hardener powder or paste.

Tg, °F/°C	Elongation, %	Ultimate Tensile Strength, psi	Coefficient of Thermal Expansion, in/in/°F	Hardness, Shore D	Maximum Service Temp., °F/°C	Suggested Applications / Comments
68/20	50	2,600	—	—	140/60	Clear transparent adhesive for bonding selected thermoplastics and thermoset composites.
59/15	15	2,050	—	—	140/60	Room-temperature curing adhesive designed for bonding SMC.
122/50	250	2,100	7.50x10 ⁻⁵	40	140/60	Tough, fast-setting adhesive formulated for bonding a wide variety of plastics.
—	—	1,800	—	—	140/60	Designed for long-term environmental performance. Low-viscosity adhesive for bonding a wide variety of substrates.
122/50	30	1,800	6.40x10 ⁻⁵	80	140/60	Designed for long-term environmental performance. Low-viscosity adhesive for bonding a wide variety of substrates.
86/30	250	2,100	7.50x10 ⁻⁵	85	140/60	Flexible adhesive for bonding a wide variety of plastics. Requires minimal surface preparation.
86/30	250	2,100	13.5x10 ⁻⁵	85	140/60	Fast-setting, flexible adhesive for bonding a wide variety of plastics. Requires minimal surface preparation.
104/40	225	1,100	8.50x10 ⁻⁵	30	120/50	Very flexible adhesive that offers excellent adhesion to polycarbonate, nylon and other plastics.
122/50	250	2,100	7.50x10 ⁻⁵	40	140/60	Fast-setting, flexible adhesive with good sag resistance for bonding thermoplastics and metals.

Tg, °F/°C	Elongation, %	Ultimate Tensile Strength, psi	Coefficient of Thermal Expansion, in/in/°F	Hardness, Shore D	Maximum Service Temp., °F/°C	Suggested Applications / Comments
264/129	5	6,300	3.29x10 ⁻⁵	85	284/140	Epoxy with good peel strength, heat resistance and chemical resistance.
235/113	9	8,400	3.45x10 ⁻⁵	84	284/140	Thixotropic, gap-filling epoxy with good heat and chemical resistance.
230/110	5	8,700	4.72x10 ⁻⁵	80	284/140	One-component epoxy that cures very quickly at normal bake temperatures.
203/95	3	4,900	4.00x10 ⁻⁵	85	250/120	One-component epoxy that cures very quickly at normal bake temperatures.
212/100	1.5	7,400	1.76x10 ⁻⁵	—	—	One-component, thixotropic epoxy with good impact strength.

Tg, °F/°C	Elongation, %	Ultimate Tensile Strength, psi	Coefficient of Thermal Expansion, in/in/°F	Hardness, Shore D	Maximum Service Temp., °F/°C	Suggested Applications/Comments
N/C ^D	7.2	3,770	3.89x10 ⁻⁵	80	266/130	Fast-curing, durable adhesive to bond metals and plastics.
N/C ^D	23	2,465	4.44x10 ⁻⁵	80	266/130	Low-viscosity, fast-curing adhesive for high-strength metal bonding.
131/55	2.3	3,480	4.17x10 ⁻⁵	80	266/130	Very high-strength adhesive for metals and plastics.
150/65	50-75	—	—	78	212/100	High-strength, chemical-resistant adhesive for plastics and metals.
110/43	50-75	—	—	75	212/100	Rapid-curing adhesive ideal for bonding plastics with minimal surface pretreatment.
105/40	35-50	2,900	—	70	250/121	Toughened, resilient adhesive for thermoplastics and composites.

D = No clear transition.



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HUNTSMAN

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