

Advanced Materials

Engineering Adhesives

Selector Guide



About Huntsman Advanced Materials

Huntsman Advanced Materials is 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 2,300 associates at 13 locations worldwide work to fulfill this promise every day. The primary markets we serve include:

- Aerospace & Defense
- Construction
- Consumer-DIY
- Electrical Engineering
- Electronics
- Paint & Coatings
- Sport & Leisure
- Wind Energy

Engineering Adhesives

For over 60 years, Huntsman Engineering Adhesives have been preferred by customers worldwide for tough bonding applications. Today, our high-performance epoxies, polyurethanes, and methacrylates, continue to provide users with outstanding performance, as well as easy handling and processing.

Huntsman Engineering Adhesives are well suited for use on metals, rigid and engineering thermoplastics, thermoset plastics and composites, rubber, ceramic, glass and other substrate combinations.

Each family of Engineering Adhesives offers different performance characteristics:

Epoxies:

One and two-component epoxies are known for their ability to produce 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. Benefits include: low shrinkage, excellent chemical and corrosion resistance, high-temperature performance to 350° F (180° C), and good electrical insulating properties.

Polyurethanes:

Two-component polyurethane adhesives generally produce more flexible, resilient bonds than epoxies and are typically the material 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, offer good sag resistance 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.

Methacrylates:

High strength and fast cure cycles characterize Huntsman's methacrylate adhesives. Methacrylates are well suited for coating small and large areas with work lives ranging from one to 20 minutes and may require less surface preparation. Handling time is from two to 35 minutes at room temperature, and adhesives can be applied from 20 to 300 mil. thick. Cured methacrylates exhibit high lap shear strength comparable to epoxies and good tensile strength.

Adhesive bonding is one of the most versatile technologies available to the manufacturing industry as it allows the assembly of a multitude of dissimilar materials and components.

Benefits include:

- Improved product performance
- Optimize product design
- Reduce manufacturing and product cost

Advantages of using adhesives are:

- Ability to join a wide range of materials
- High load carrying capacity
- Excellent stress distribution
- Outstanding fatigue resistance
- Smooth surfaces
- Completely sealed joints
- Design freedom
- User friendly processing conditions – room temperature to 200° C maximum
- Ideal for composite materials
- Bonding of skin panels to foams and honeycomb structures
- Very low weight potential
- High specific performance – strength or stiffness/density
- Excellent resistance to fuels and oils
- Good general resistance to water, chemicals and solvents
- Potential material cost reductions
- Reduced labor costs

Packaging

Huntsman engineering adhesives are supplied in a variety of packaging options. Consult your Huntsman Advanced Materials sales representative for information on available package sizes for specific adhesives.



Engineering Adhesives

Typical Properties

		Araldite® AW 2104 / Hardener HW 2934 (Araldite® 2012)	Fastweld™ 10	Araldite® AY 557 / Hardener HY 557	Araldite® AW 8621 / Hardener HW 8621-3	Araldite® 8628 / Araldite® 8629 (Araldite® 2028)	Araldite® AW 106 / Hardener HV 953 (Araldite® 2011)		Araldite® AW 8680 / Hardener HW 8680 (Araldite® 2040)	Araldite® AY 8650 / Hardener HY 8650	Araldite® AY 8650 / Hardener 5090-1	Araldite® AW 8680 / Hardener HW 8685	Araldite® AW 8680 / Hardener HW 5542 (Araldite® 2042)	Araldite® AW 8680 / Hardener HW 5541 (Araldite® 2041)	Araldite® 8683 / Hardener HY 8683
Key Property		RAPID CURE				TRANSPARENT	MULTI PURPOSE		FLEXIBLE						
Chemical Type		EPO	EPO	EPO	PUR	PUR	EPO		PUR	PUR	PUR	PUR	PUR	PUR	PUR
Key Features		<ul style="list-style-type: none"> High shear and peel strength Tough and resilient Bonds a wide variety of materials 	<ul style="list-style-type: none"> Suitable for small parts and repair work Excellent general purpose shop adhesive 	<ul style="list-style-type: none"> Transparent bondline Well suited for small parts 	<ul style="list-style-type: none"> Tough and Resilient Well suited for plastic bonding 	<ul style="list-style-type: none"> Fast curing UV stable Water clear 	<ul style="list-style-type: none"> High shear and peel strength Easy to apply Long working time 		<ul style="list-style-type: none"> Long open time Gap filling Ideal for bonding plastics 	<ul style="list-style-type: none"> Spray applied Good performance at broad range of temperatures Bonds a wide variety of materials Features good peel strength 	<ul style="list-style-type: none"> Can be roll coated or high speed extrusion applied Good temperature range performance Bonds a wide variety of materials Good peel strength 	<ul style="list-style-type: none"> Tough and resilient Bonds a wide variety of materials Instant thixotropy after mixing 	<ul style="list-style-type: none"> Bonds a wide variety of materials Rapid cure Ideal for bonding plastics Gap filling 	<ul style="list-style-type: none"> Bonds a wide variety of materials Rapid cure Ideal for bonding plastics 	<ul style="list-style-type: none"> Tough and resilient Easily dispensable Well suited for filter bonding
Processing Data	Viscosity, Mixed, cp (RT)	30,000	250,000	Self-leveling	Self-leveling	2,000	45,000		50,000	6,000	6,000	35,000	Thixotropic Paste	50,000	3,000
	Mix Ratio, R/H (V/V)	100/100	100/100	100/100	85/100	100/100	100/100		100/100	100/40	100/40	100/100	100/100	100/100	100/60
	Pot Life (Gel Time) @ 77°F, 100g mix	7	3	3	5	4	100		15	9	80	9	3	15	15
	Minimum Cure Time, 77°F, hr	24	4	4	12	6	24		48	24	24	12	6	16	24
	Color, Mixed Adhesive	Pale yellow	Gray	Colorless	Black	Colorless	Pale yellow		Gray	Beige	Beige	Black	Pink	Pink	Blue
Performance Data	Lap shear strength, Al*, psi	2,600	2,800	2,560	2,900	2,000	3,700		1,200	2,300	2,300	2,200	2,300	1,930	TBD
	% Elongation	NA	5	TBD	250	34	9		165	30	TBD	250	250	250	475
	Tg* (DMA), °F(°C)	130 (55)	160 (71)	TBD	122 (50)	45 (7) DSC	147 (64)		82 (28)	127 (53)	TBD	88 (31)	86 (30)	126 (52)	32 (0)
	Gap Filling (Sag Resistance)	No	Yes	No	No	No	No		Yes	No	No	Yes	Yes	Yes	No
	Resistance Properties														
	Thermal	E	M	E	M	M	G		M	M	M	M	M	M	M
	Chemical	G	G	G	M	M	E		M	M	M	M	M	M	M
	Water	G	G	G	M	M	G		M	M	M	M	M	M	M
Impact	E	M	M	E	G	E		E	E	E	E	E	E	E	
Packaging	Tubes		√				√								
	Cartridges														
	50ml		√	√								√			
	200ml											√			
	Working Packs								√						
	Pail	√	√	√	√	√	√		√			√	√	√	√
	Drums	√		√		√				√	√				

Key: E=Excellent, G=Good, M=Moderate, EPO=Epoxy, ACR=Acrylic, PUR=Polyurethane

* Please refer to TDS for specific cure cycles

Engineering Adhesives

Typical Properties

		Araldite® AW 8595 / Hardener HW 8595	Araldite® AW 8545-1 / Hardener HW 8545-1	XD 4661 A / XD 4661 B (Araldite® 2021)	XD 4662 / Hardener 4662 (Araldite® 2022)	XB 5308 / Hardener 5309-1 (Araldite® 2015)		Araldite® AY 557 / Hardener HY 5049	TDR 1100-11 Resin / Hardener 1100-11	Araldite® 9234	Araldite® 8579 / Hardener 8579	Araldite® AV 170	Araldite® AW 139 / Hardener 5323 (Araldite® 2014)	Araldite® AV 8574 / Hardener HV 8574
Key Property		TOUGHENED						LONG OPEN TIME			TEMPERATURE / CHEMICAL RESITANT			
Chemical Type		EPO	EPO	ACR	ACR	EPO		EPO	EPO	PUR	EPO	EPO	EPO	EPO
Key Features		<ul style="list-style-type: none"> Long working life Bonds a wide variety of materials Excellent on "less than perfectly" prepped surfaces 	<ul style="list-style-type: none"> Good Flexibility Low coefficient of thermal expansion Excellent on "less than perfectly" prepped surfaces 	<ul style="list-style-type: none"> High shear and peel strength Very fast curing with good gap filling properties Excellent bond to a wide range of plastics, composites and metals 	<ul style="list-style-type: none"> Excellent resistance to gasoline and oil exposure Versatile and gap filling Rapid curing Minimal surface preparation required 	<ul style="list-style-type: none"> Ideal for bonding composites Low shrinkage Gap filling High shear and peel strength 		<ul style="list-style-type: none"> High strength under static load Laminating adhesive Transparent bond line 	<ul style="list-style-type: none"> Bonding glass laminate, wood and plastic components Clear bond lines at high-temp cures Ideal for archery equipment 	<ul style="list-style-type: none"> Moisture curable Well suited for bonding honeycomb structures Long working life 	<ul style="list-style-type: none"> Long working life Gap filling Low shrinkage 	<ul style="list-style-type: none"> Cures at 140-180°C Heat resistant to 120°C Very good peel strength Gap filling 	<ul style="list-style-type: none"> Heat resistant to 248°F (120°C) Gap-filling Bonds a wide variety of materials 	<ul style="list-style-type: none"> Long working life Aluminum filled Thermal conductivity
Processing Data	Viscosity, Mixed, cp (RT)	21,000	43,000	45,000	60,000	Thixotropic Paste		2,800	13,000	3,100	125,000	Thixotropic Paste	Thixotropic Paste	118,000
	Mix Ratio, R/H (V/V)	100/100	100/100	100/100	100/100	100/100		100/54	100/50	One part	100/40	One part	100/50	100/50
	Pot Life (Gel Time) @ 77°F, 100g mix	60	120	3	10	35		75	95	>60	60	See Data Sheet	60	120
	Minimum Cure Time, 77°F, hr	24	24	24	24	24		24	24	24	24	See Data Sheet	24	1
	Color, Mixed Adhesive	Cream	Light green	Pale yellow	Beige	Beige		Amber	Translucent	Brownish red	Gray	Off-white	Gray	Black
Performance Data	Lap shear strength, Al*, psi	2,600	3,000	3,200	3,600	2,400		2,400	4,100	TBD	2,300	4,000	2,700	3,400
	% Elongation	50	20	60	60	4		4	5	TBD	1	1.4	TBD	TBD
	Tg* (DMA), °F(°C)	162 (72)	135 (57)	102 (39)	106 (41)	181 (83)		142 (61)	126 (52)	TBD	183 (84)	264 (129)	169 (76)	198 (92)
	Gap Filling (Sag Resistance)	No	No	Yes	Yes	Yes		No	No	No	Yes	Yes	Yes	Yes
	Resistance Properties													
	Thermal	G	G	M	M	E		G	G	G	E	E	E	E
	Chemical	G	G	G	M	G		E	G	M	E	E	E	E
	Water	G	G	G	G	G		E	G	M	G	E	E	G
Impact	E	G	E	E	G		G	G	E	M	M	G	M	
Packaging	Tubes													
	Cartridges													
	50ml	√												
	200ml	√												
	Working Packs					√					√	√	√	
	Pail	√		√	√	√			√		√		√	√
	Drums	√	√					√		√	√			

Key: E=Excellent, G=Good, M=Moderate, EPO=Epoxy, ACR=Acrylic, PUR=Polyurethane

* Please refer to TDS for specific cure cycles

Global Presence – 13 Manufacturing Sites



HUNTSMAN

Enriching lives through innovation

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