

## Main resins for composites (base raw materials for formulators)

Product designation	Tg (DMA) (°C)	Relative Thermal Stability	Comments
<b>Bifunctional epoxy resins</b>			
Based on Bisphenol F <b>Araldite® PY 306</b>	170*	•	Extremely low viscosity and high purity resin
Based on Bisphenol A <b>Araldite® LY 556</b> <b>Tactix® 123</b>	185*	•	Standard resin for aerospace use High purity resin
<b>Multifunctional epoxy resins</b>			
Based on Phenol / Cresol Novolac <b>Araldite® EPN 1138</b> <b>Araldite® ECN 1299, ECN 1280, ECN 1273</b> <b>Araldite® ECN 9511</b>	200*	•	Used as an up-grader in epoxy formulations to improve all properties (thermal, mechanical and chemical resistance)
Based on Dicyclopentadiene <b>Tactix® 556</b>	235*	•	High moisture resistant resin
Based on Diaminodiphenylmethane <b>Araldite® MY 720</b> <b>Araldite® MY 721</b> <b>Araldite® MY 9512</b> <b>Araldite® MY 9634</b> <b>Araldite® MY 9655</b> <b>Araldite® MY 9663</b>	250*	•	High performance multifunctional resins, with a wide choice of viscosity specifications. Lowest viscosity available with MY 721. Suitable for continuous use in moist environment up to 120 °C
Based on Aminophenol <b>Araldite® MY 0500</b> <b>Araldite® MY 0510</b> <b>Araldite® MY 0600</b>	250*	•	High Tg and low viscosity resins can be used for viscosity adjustments of multifunctional resin formulations, or to help the blending of tougheners. Also are frequently used in adhesive formulations to upgrade thermal performance of liquid epoxy resins
Based on Trisphenol <b>Tactix® 742</b>	325*	•	Highest thermal stability epoxy (recommended for long-term thermal aging > 120°C). Resin stable storage at room temperature
<b>Benzoxazines</b>			
<b>XU 3560**</b> <b>XU 8282-1**</b>	165	••	Very high modulus, extremely low shrinkage and low moisture pick-up thermoset resin, having great synergy with epoxy resin (Tg increase to 200°C). Thermal stability between multifunctional epoxy and bismaleimides
<b>Bismaleimides</b>			
<b>Matrimid® 5292 A</b> <b>Matrimid® 5292 B</b>	295	••	Widely used curable thermoset resin system with excellent long-term thermal stability. Continuous use in moist environment up to 180°C
<b>Cyanate Esters</b>			
<b>AroCy® L10</b> <b>AroCy® XU 371</b> <b>AroCy® XU 71787.02L</b> <b>AroCy® XU 71787.07L</b>	260-295	••	Very low moisture absorption and low products, associated with excellent dielectric properties and thermal performance. Large range of resins available (aspects, Tg, final properties like toughness)
<b>Polyamide-imides</b>			
<b>Rhodefal® 200</b> <b>Rhodefal® 311</b>	280	•••	Exceptional chemical resistance and thermal stability combined with a strong adhesion to metals and a good dielectric rigidity. Suitable for continuous use up to 220°C. Used for the preparation of enamel varnishes, protection varnishes, and high temperature impregnation varnishes. Products are supplied in solvent

\*when cured with Aradur® 976-1 (4,4'-DDS), \*\*EINECS registration pending

## Special tougheners for composites (base raw materials for formulators)

<b>Matrimid® 5218</b> <b>Matrimid® 9725</b>	300	•••	Soluble thermoplastic polyimide, fully imidized, designed for extreme temperature applications (continuous use > 230°C). Also used as high temperature toughener in epoxy and for the preparation of gas separation membranes. Micronized powder available
<b>Flexibilizer DY 965</b>	-	•••	Recommended for the preparation of high impact resistant epoxy resin systems

## High performance hardeners (base raw materials for formulators)

Product designation	ASSAY (%)	Melting Point (°C)	Mean particle size (µm)	Comments
<b>Aradur® 976-1</b>	> 99	175	-	4.4' DDS
<b>Aradur® 9664-1</b>	> 98	175	< 70	Micropulverised 4.4' DDS
<b>Aradur® 9719-1</b>	> 98	170	< 60	Micropulverised 3.3' DDS

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# Aerospace Parts Manufacturing and Repair Selector guide



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As the aerospace industry gains an increasing awareness of the benefits of composites materials, Huntsman Advanced Materials products are at the forefront of technology, offering a range of resin systems for fiber reinforcement, adhesives and syntactics. Many products are included as approved repair materials in manufacturers' structural repair manuals and service bulletins.

## Syntactics

Product designation	Selected specifications	Work Life	Curing Class	Typ. Service Temperature	Compressive Strength	Density	Key characteristics
Conditions Unit							

### Ultra-low density

#### One-component syntactic

<b>Epocast® 1610-A1</b>	BMS 5-28, Type 10	30 days	120	90	16 <sup>1)</sup>	0.50	Temperature resistance
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#### Two-component syntactics

<b>Araldite® 1641-A/B</b>	MSRR 1076	180	100	90	13 <sup>1)</sup>	0.50	Vibration damping
<b>Epocast® 1628-A/B</b>	BMS 5-28, Type 28	60	RT	70	21 <sup>1)</sup>	0.50	Non sag consistency Self-extinguishing
<b>Araldite® 1644 A/B</b>	AIMS 10-03-001	30	RT or 80	80	30 <sup>2)</sup>	0.55	High compression strength

### Low density

#### One-component frozen syntactic

<b>Epocast® 1614-A1</b>	BMS 5-28, Type 14, Class 1	8 hr	120	180	100 <sup>1)</sup>	0.75	High compression strength Self-extinguishing
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#### Two-component syntactics

<b>Araldite® 252-A/B</b>	ASNA 4072, issA	60	RT	70	35 <sup>1)</sup>	0.65	Good lap shear strength Self-extinguishing
<b>Epocast® 1626 products</b>	BMS 5-28, Type 26	5-60	RT	70	17 <sup>1)</sup>	0.65	Toughened foam
<b>Epocast® 169-A/9615</b>	SS-9587, Type 1	90	RT	70	14 <sup>1)</sup>	0.68	Long work life Wood-like
<b>Epocast® 1638-A/B</b>	FAR 25.853	12-25	RT	80	50 <sup>1)</sup>	0.70	Compression strength Self-extinguishing
<b>Epocast® 1618-D/B</b>	BMS 5-28, Type 18, Class 1	15	RT	90	34 <sup>1)</sup>	0.70	Pumpable Self-extinguishing
<b>Epocast® 1633 products</b>	BMS 5-28, Type 18, Class 2, AIMS 08-08-001-04	2-5	RT	70	45 <sup>1)</sup>	0.73	In 4 colours Self-extinguishing

### Medium density

#### Two-component syntactics

<b>Epocast® 1656-A/B</b>	GM 4006, Type 1, Class B	50-90	RT	120	55 <sup>1)</sup>	0.80	Long work life
<b>Epocast® 1652A/B</b>	GM 4006, Type 1, Class B, SS-9587, Type 2	30-60	RT	180	55 <sup>1)</sup>	0.80	Temperature resistance
<b>Epocast® 89537-A/B</b>	BMS 5-28, Type 7, Class 2	70	RT	180	59 <sup>1)</sup>	0.90	No sagging up to 12.5 mm Self-extinguishing
<b>CG 1305-R/H</b>	BMS 5-28, Type 7, Class 1	> 60	RT	180	60 <sup>1)</sup>	0.90	Low CTE Self-extinguishing

### High density

#### One component frozen syntactic

<b>Epocast® 1627</b>	BMS 5-28, Type 27	24 hr	180	180	207 <sup>1)</sup>	1.80	High compression strength Low CTE
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#### Two-component syntactics

<b>Epocast® 1511-A/B</b>	BMS 5-28, Type 3	40-60	RT	90	69 <sup>1)</sup>	1.25	Fast cure Non flow
<b>Epocast® 1636-A/B</b>	BMS 5-28, Type 6	120	RT	180	103 <sup>1)</sup>	1.72	Long work life Self-extinguishing

<sup>1)</sup> ASTM D-695 • <sup>2)</sup> ISO 604 • RT : Room Temperature = 23±2°C

## Adhesives

Product designation	Selected specifications	Mixed Viscosity	Work Life	Curing Class	Typ. Service Temperature	Lap Shear Strength (al/al)*		Key characteristics
Conditions Unit						RT (mPa.s)	RT (min)	

### Epoxy adhesives

<b>Araldite® 204</b>	ABR2-0048	3 500 000	N/A	120	90	12	10	Foaming
<b>Araldite® 1570 A/B</b>	AIMS 10-04-006	300 000	60	RT	60	17	5	Self-extinguishing FAR 25.856 Polyolefins bonding
<b>Araldite® 2013</b>	ABP 5-1158 Issue 2	Paste	65	RT	60	21	5	No sagging up to 5 mm Multipurpose
<b>Araldite® 2011</b>	ABR2-1079 DAN 1284-01	Non-sag paste	100	RT	60	25	8	Multipurpose Tough
<b>Epibond® 1217-A/B</b>	HMS 16-1068, CL 8B	Paste	4-8	RT	65	17	3	Translucent Fast cure
<b>Araldite® 420-A/B</b>	ASNA 4125, issB	Semi-paste	120-200	RT	70	35	4	High lap shear strength Tough
<b>Epibond® 8543-C/B</b>	BMS 5-123 Type 1, Class 3	Non-sag paste	3	RT	80	14	3	Fast cure at low temperature
<b>Araldite® 2015</b>	ABR2-1081	Non-sag paste	35	RT	80	20	12	No sagging up to 10 mm Tough
<b>Epibond® 1210 A/B</b>	LAC 40-4093 Class B	Soft paste	50-75	RT	90	17	2	Flexible bond line
<b>Epibond® 1544 products</b>	BMS 5-126, Type 4	Semi-paste	10-20	RT	90	18	-	Self-extinguishing FAR 25.853
<b>Epibond® 156-A/B</b>	-	Soft paste	20-50	RT	120	14	13.5	Electrical properties
<b>Epibond® 1590 FST A/B</b>	DAN 1199-01, DAN 1187-01	120 000	60	RT	120	22	11	Self-extinguishing For metals & thermoplastics
<b>Epibond® 1590-3mm A/B</b>	AIMS 10-07-002	2 000 000	50	70	120	32	20	Liquid shim High compression strength
<b>Epibond® 1210-A/9861</b>	LAC 30-4639-0200	Semi-paste	35-60	RT	150	19	17	Good temperature resistance
<b>Epibond® 1590-A/B</b>	AIMS 10-09-001	70 000	30	60	150	38	23	Structural adhesive
<b>Araldite® XD 4510 / Araldite® XD 451</b>	-	100 000	90	130	180	17	17	High temperature resistance

### Polyurethane adhesives

<b>Uralane® 5774-A/C</b>	AIMS 10-04-001 BMS 5-105, Type 5, LES 1359	Semi-paste	15-20	RT	80	15	9	High peel strength
<b>Uralane® 5777-A/B</b>	GD 0-73668, Type 3	Semi-paste	10-12	RT	80	15	7	Automatic dispensing

### Methacrylic adhesives

<b>Araldite® 2021</b>	-	40 000	2-3	RT	100	23	17	High elongation at break
<b>Agomet® F330</b>	-	18 000	10	RT	130	33	-	Temperature and mechanical resistance

\* ASTM D-1002 • RT : Room Temperature = 23±2°C

## Laminating systems

Product designation	Selected specifications	Mixed Viscosity	Work Life	Curing Class	Typ. Service Temperature	Key characteristics
Conditions Unit						

<b>Epocast® 50-A1 products</b>	BMS 8-201, Type 3/4	2 400	20-65	RT or 80	80	Long or short work life. Self extinguishing FAR 25.853A
<b>Epocast® 54 A/B</b>	AIMS 04-27-000-01	8 000	15-25	RT or 70 or 90	80	Self extinguishing FAR 25.853A
<b>Araldite® LY 5052 / Aradur® 5052</b>	-	800	130	RT or 50 or 100	100	Transparent, low viscosity
<b>Araldite® 501-A/B</b>	ASNA 4047, Issue B	3 500	90	RT or 45 or 70	120	Long work life
<b>Epocast® 52-A/B</b>	AIMS 08-01-002-01 AIMS 08-02-002-01 BMS 8-301	5 500	4.5-5.5 hr	70 or 90	150	Temperature resistance
<b>Araldite® LY 5210 / Aradur® 5212</b>	-	2 000	12 hr	120-200	200	High temperature resistance

RT : Room Temperature = 23±2°C

## Infusion systems

Product designation	Mixed Viscosity	Pot Life	Gel Time Hot Plate	Curing Class	Glass Transition Temperature	Key characteristics
Conditions Unit	40°C (mPa.s)	RT / 100 ml (min)	(°C)	(°C)	DSC (10K/min) (°C)	

<b>Araldite® LY 5052 / Aradur® 5052</b>	200	50 @ 40°C	460 min @ RT	RT or 50 or 100	100-130	Cold curing
<b>Araldite® LY 564 / Aradur® 22962</b>	150	130	3-6 min @ 120	120	120-130	Fast cure
<b>Araldite® LY 564 / Aradur® 2954</b>	250	150 @ 40°C	40 min @ 80	80 + 140	130-150	Good chemical resistance
<b>Araldite® LY 556 / Hardener XB 3473</b>	800	35 hr	68-78 min @ 120	120 + 180	185-195	High temperature resistance

RT : Room Temperature = 23±2°C

## Mould release agents

Product designation	Supplied form	Key characteristics
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<b>QZ 5101</b>	Blue liquid	Poly Vinyl Alcohol based suitable as sealer for porous substrate
<b>QV 5110</b>	White paste	Wax based Polishable to lustre
<b>QZ 5111</b>	White liquid	Wax based Hard layer
<b>QZ 13</b>	Colourless liquid	Silicone based



Products which are also suitable for Maintenance and Repair.

