HUNTSMAN

Enriching lives through innovation

Advanced Materials

Epoxy resins & hardeners

Selector guide

- Epoxy resins
- Hardeners
- Accelerators
- Additives
- Waterborne system
- Thermoplastic PAA

About Huntsman

Huntsman is a global manufacturer and marketer of differentiated chemicals. Its operating companies manufacture products for a variety of global industries, including chemicals, plastics, automotive, aviation, textiles, footwear, paints and coatings, construction, technology, agriculture, health care, detergent, personal care, furniture, appliances and packaging. Originally known for pioneering innovations in packaging and, later, for rapid and integrated growth in petrochemicals, Huntsman today has more than 12,000 employees and operates from multiple locations worldwide. The Company has 2008 revenues exceeding $10 billion.

For more details, please contact our sales engineers or send an e-mail to advanced_materials@huntsman.com

Basic liquid epoxy resins • Araldite® / Tactix® / Quatrex®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Flash point [°C]	Comments/Applications
GY 250	5.30-5.45	183-189	10,000-12,000	≤2	≥200	General purpose high viscosity unmodified basic liquid epoxy resin based on bisphenol-A.
GY 9708-3	5.20-5.50	182-192	11,000-14,000	≤1	≥200	General purpose high viscosity unmodified basic liquid epoxy resin based on bisphenol-A.
GY 6010	5.20-5.50	182-192	11,000-14,000	≤1	≥200	General purpose high viscosity unmodified basic liquid epoxy resin based on bisphenol-A.
GY 280	3.57-4.45	225-280	450-700[1)]	≤3[1)]	≥100	Semi-solid epoxy resin based on bisphenol-A for high solid corrosion protective coatings.
GY 2600	5.29-5.43	185-189	12,000-14,000	≤2	≥200	High purity bisphenol-A based epoxy resin for CED application, low hydrolyzable chlorine content (200-300 ppm).
Quatrex® 1010	5.26-5.50	182-190	11,000-14,000	-	-	High purity bisphenol-A based epoxy resin, very low hydrolyzable chlorine content (< 200 ppm).
MY 790-1	5.70-5.90	169-175	4,000-5,500	-	>200	High purity bisphenol-A based epoxy resin, extremely low total chlorine content (about 700 ppm) and hydrolyzable chlorine content (< 200 ppm).
Tactix® 123	5.68-5.80	172-176	4,400-5,600	-	-	Very low viscosity bisphenol-A based epoxy resin for applications such as filament winding.
CY 179	7.0-7.6	131-143	350-450	≤1	118	Low viscosity cycloaliphatic epoxy resin for outdoor applications.
CY 184	5.80-6.10	164-173	700-900	-	≥169	Low viscosity cycloaliphatic epoxy resin for outdoor applications.

1) being semi-solid, this is determined with a 70% solution in butylcarbitol

Basic solid epoxy resins • Araldite®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Softening point [°C]	Comments/Applications
GT 7071	1.90-2.00	500-525	200-250	≤1	77-82	Standard basic type-1 resin for corrosion protective coatings.
GT 7072	1.68-1.75	570-595	280-340	≤1	82-90	Standard basic type-2 resin for high flow powder coating or corrosion protective coatings.
GT 6063	1.37-1.56	640-730	350-500	≤1	90-97	Type 2½ epoxy resin for polyester rich hybrids and straight epoxy powder coatings.
GT 6064	1.28-1.37	730-780	450-650	≤1	96-101	Type 3½ resin for straight epoxy and hybrid powder coatings with excellent flow performance.
GT 7004	1.33-1.40	715-750	500-600	≤1	95-101	General purpose type 3½ epoxy resin for hybrid and straight epoxy powder coatings with high storage stability and good overall properties.
GT 6084-2	1.12-1.20	833-890	550-700	≤2	99-105	Type 4 epoxy resin for functional applications, with outstanding flexibility and storage stability. In very hot climates, improving the storage stability of decorative powder coatings.
GT 6097	0.53-0.59	1,695-1,885	1,800-2,600	≤1	120-132	Standard type 7 epoxy resin for packaging and coil coating application when combined with phenol-formaldehyde or amino resins. Coatings show excellent chemical resistance and flexibility.
GT 6099	0.34-0.42	2,380-2,940	5,000-10,000	≤2	143-158	Standard type 9 epoxy resin with better flexibility than Araldite® GT 6097.
GT 6609	0.34-0.42	2,380-2,940	3,500-5,500	≤1	~150	Similar to Araldite® GT 6099 with greatly reduced viscosity.
GT 6610	0.26-0.34	2,940-3,846	5,000-8,000	≤2	~150	Similar to Araldite® GT 6099, ideal for more flexible and higher viscous lacquers.
GT 7220	1.83-1.93	518-546	460-670	≤2	~95	Type 4 solid epoxy resin modified with epoxy phenol novolac high reactivity, medium melt viscosity with low temperature curing capabilities. Improves thermal and chemical resistance over conventional epoxy resins.
GT 7255	1.17-1.29	775-855	1,430-1,850	≤1	106-113	Type 7 solid epoxy resin modified with epoxy phenol novolac, for powder coatings showing good chemical resistance and mechanical performances.
GT 1999	1.08-1.20	833-926	450-600	≤1	90-95	Fatty acid modified type 4 epoxy resin with 2.5% flow agent for powder coating providing excellent corrosion resistance, pigment wetting and adhesion on difficult substrates.
GT 2874	1.15-1.35	740-870	350-550	≤2	85-95	Type 3½ epoxy resin with 10% flow agent (masterbatch) for epoxy and epoxy/polyester hybrid powder coatings.
GT 6450	1.37-1.56	640-730	350-500	≤2	91-94	Type 2½ epoxy resin based on Araldite® GT 6063 modified with 2% flow agent. For the formulation of hybrids with excellent flow and good storage stability.

1) 40% solution in butylcarbitol

Basic epoxy resin solutions • Araldite®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Solids [°C]	Comments/Applications
GZ 280 X 80	3.10-3.40	290-323	600-850	≤3	79.0-81.0	Araldite® GY 280 in xylene.
GZ 290 X 90	3.30-3.70	270-305	1,300-3,700	≤6	89.0-91.0	Modified semi-solid resin in xylene for high solid content coatings in ship-building, maintenance, and anti-corrosion protection.
GZ 7071 X 75	1.50-1.67	600-670	7,000-10,000	≤2	74.0-76.0	Araldite® GT 7071 in xylene.
GZ 7488 V 40	≤0.06	≥17,000	3,000-6,000	≤4	39.0-41.0	Epoxy resin solution with high molecular weight, mainly with amino and phenolformaldehyde resins for very flexible coil primers and to flexibilise can coatings.
GZ 7488 N 50	≤0.08	≥12,500	2,000-5,000	≤4	49.0-51.0	Similar to Araldite® GZ 7488 V 40 but dissolved in MEK/cyclohexanon. Due to the MEK, preferably for ambient curing corrosion protection.

Premium resins • Araldite®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Flash point [°C]	Comments/Applications
Bisphenol F and A/F pure • Araldite®						
GY 281	5.80-6.30	158-172	5,000-7,000	<4	≥200	Unmodified, bis F epoxy for coating, adhesives, composites and casting.
GY 282	5.80-6.10	164-172	3,000-4,000	≤5	≥200	Low viscosity bis F epoxy for coating, adhesives, composites and casting.
GY 285	5.80-6.10	164-173	2,000-3,000	≤5	≥200	Very low viscosity bis F epoxy for coating, adhesives, composites and casting.
PY 302-2	5.65-5.90	169-177	6,500-8,000	≤3	≥200	BPA/BPF resin, absolutely no crystallization.
PY 304	5.50-5.80	172-182	6,500-8,000	≤3	≥200	BPA/BPF resin, extremely low crystallization tendency.
PY 306	6.00-6.40	156-167	1,200-1,600	-	≥200	High purity, very low viscosity bis F epoxy for coating, adhesives, composites and casting.

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Flash point [°C]	Comments/Applications
Bisphenol F and A/F with reactive diluent • Araldite®						
BY 157	5.35-5.50	182-187	4,200-5,700	≤2	≥172	For floorings and mortars application.
BY 158	6.20-6.50	154-161	280-360	≤3	≥142	For injection system and polymer concrete.
GY 191	4.95-5.25	190-208	500-1,000	≤3	≥155	For solvent free coatings, mortars and injection system.
GY 253	5.40-5.80	172-185	800-1,300	≤2	≥145	For solvent free coatings, mortars and injection system.
GY 257	5.20-5.50	182-192	500-650	≤3	≥120	Good chemical resistance to acid but less resistant to solvents.
GY 286	4.78-5.10	196-209	900-1500	≤3	>95	Formulate solvent free coatings, mortars and injection system.
GY 298	2.20-2.50	400-455	2,000-4,000	≤2	≥188	High flexibility, nearly non-crystallizing.
GY 776	5.10-5.40	185-196	2,700-3,800	≤2	≥190	For solvent free coatings, dispersion coatings and adhesives.
GY 783	5.10-5.40	185-196	800-1,100	≤2	≥130	For floorings and mortars application, flexibilizing.
Toughened/Flexibilized Resins • Araldite®						
GY 298	2.20-2.50	400-455	2,000-4,000	≤2	≥188	High flexibility, nearly non-crystallizing.
XU 3508	4.85-5.20	191-206	11,000-13,000	-	-	Liquid toughened epoxy resin based on bisphenol A for filament winding, pultrusion and adhesive applications.
PY 4122	2.7-3.0	330-365	700-1,300	-	-	Low viscosity, unmodified tough flexible epoxy with excellent workability.
XU 71790.04L	3.3-3.6	275-305	1,000-4,000[1)]	-	-	Acrylic modified bisphenol A epoxy resin for adhesives, composites and electronic packaging.
DY 965	-	1.00-1.15[2)]	440-1,280[3)]	-	≥200	Polyurethane polyol for high impact resistance epoxy resin for improving adhesion to metals and for dust-free electronics.
LT 1522	0.55-0.64	1,562-1,820	-	-	-	Type-4 epoxy resin modified with CTBN copolymer for adhesives, composites and powder coating.
Tactix® 695	2.4-3.0	335-410	1,500-5,500[5)]	-	325	Single phase toughened epoxy.

1) 70°C; 2) OH+ Equiv. [eq/kg]; 3) 40°C, Pas

Reactive Diluents • Araldite®						
DY-C	5.60-6.00	167-179	60-90	≤2	≥130	Diglycidylether of cyclohexane dimethanol.
DY-E	3.05-3.35	299-328	4-12	≤2	≥155	Monoglycidylether of C12-C14 alcohol.
DY-D	8.00-8.50	118-125	15-25	≤2	≥156	Diglycidylether of butanediol.
DY-F	1.95-2.35	425-513	60-90	≤3	≥130	Diglycidylether of polyoxypropylene glycol.
DY-H	6.25-6.65	150-160	21-31	≤2	≥150	Diglycidylether of 1.6-hexanediol.
DY-K	5.30-5.70	175-189	6-12	≤2	≥125	Monoglycidylether of cresol.
DY-L	1.48-1.80	556-714	140-200	≤5	≥130	Triglycidylether of polyoxypropylene glycol.
DY-P	4.30-4.70	213-233	20-28	≤3	≥135	Monoglycidylether of p-tert. buthylphenol.
DY-T	7.00-9.00	111-143	100-200	≤3	≥100	Triglycidylether of trimethyolpropane.
DY 3601	2.47-2.60	385-405	42-52	≤3	≥183	Diglycidylether of polyoxypropylene glycol.
DY-CNO	1.70-2.40	425-575	30-70	≤13	≥200	Monoglycidylether of cashew nut shell liquid.

Multifunctional resins • Araldite® / Tactix®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Tg [DMA][1)] [°C]	Comments/Applications
Epoxy Phenol Novolacs (EPN) • Araldite®						
PY 307-1	5.60-5.90	165-179	30,000-50,000	≤4	-	Lowest viscosity, pure EPN, functionality 2.2 for solvent free or high solid content coatings with high chemical resistance.
EPN 1179	5.60-5.80	172-179	1,100-1,700[2)]	≤3	200	Semi-solid EPN, functionality 2.5 for solvent free or high solid content coatings with high chemical resistance.
EPN 1138	5.50-5.70	175-182	20,000-50,000[2)]	≤2	200	Semi-solid EPN, functionality 3.6 for solvent free or high solid content coatings with high chemical resistance.
EPN 1183	6.30-6.90	145-159	7,000-11,000	≤3	-	Medium viscosity, modified EPN, functionality 3.3. Used for coatings with high fuel resistance (with Aradur® 2973).
GY 289	5.70-6.00	167-175	7,000-11,000	≤5	-	Low viscosity EPN, functionality 2.3. It's suitable for coatings coming into contact with foodstuffs according to FDA regulation 21 CFR 175.300.

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Solids [°C]	Comments/Applications
Epoxy Phenol Novolacs (EPN) solution • Araldite®						
EPN 1180 X 80	4.40-4.56	219-227	1,200-2,000	≤2	79.0-81.0	Araldite® EPN 1138 in xylene.
EPN 1180 Y 86	4.73-4.90	204-211	9,000-13,000	≤3	85.0-97.0	Araldite® EPN 1138 in butyl glycol acetate.

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 130°C [mPa s]	Softening point [°C]	Tg [DMA][1)] [°C]	Comments/Applications
Epoxy Cresol Novolacs (ECN) • Araldite®						
ECN 1273	4.30-4.60	217-233	-	68-78	200	ECN with functionality 4.8. For high temperature adhesives, electrical and laminating product areas.
ECN 1280	4.30-4.70	212-233	-	78-85	200	ECN with functionality 5.1. For high temperature adhesives, electrical and laminating product areas.
ECN 1299	4.10-4.60	217-244	7,000-15,000[7)]	85-100	200	ECN with functionality 5.4. Highest melting ECN.
ECN 9511	4.40-5.00	200-227	-	32-42	-	ECN with functionality 2.7.
ECN 9699	4.30-4.70	213-233	7,000-10,000	80-100	-	ECN with high functionality (~5.5) as modifier in combination with standard epoxy resins or other multifunctional epoxy resins such as Araldite® GT 7220 and Araldite® GT 7255 for coatings showing very high chemical – and excellent temperature resistance.

Other multifunctional resins • Araldite® / Tactix®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Softening point [°C]	Tg [DMA][1] [°C]	Comments/Applications
MY 0500	8.6-9.5	105-115	2,000-5,000	-	250	Trifunctional low viscosity epoxy resin. Used for rapid cure adhesives, laminates, etc., having exceptional high heat deflection temperature.
MY 0510	9.3-10.5	95-107	550-850	-	250	High purity MY 0500. Improved stability.
MY 0600	9.2-9.8	102-109	6,000-11,000	-	250	High Tg low viscosity resin can be used for adjustments of multifunctional resin formulations, or to help the blending of toughners. Also are frequently used in adhesive formulations to upgrade thermal performance of liquid epoxy reins.
MY 720	7.5-8.5	117-134	8,000-18,000[3]	-	250	Tera-functional liquid epoxy resin. Excellent high temperature, chemical and radiation resistance. Used for high performance composites, adhesives, laminates and high-energy radiation resistant components. Suitable for continuous use in moist environment up to 120°C.
MY 721	8.6-9.1	109-115	3,600-5,000[3]	-	250	Lowest viscosity, tetra-functional epoxy resin with the same chemistry as MY 720.
XB 9721	8.6-9.1	109-115	3,600-5,000[3]	-	250	Industrial grade MY 721.
MY 9512	7.5-8.5	117-134	11,000-13,000[3]	-	250	Narrow viscosity of tetra-functional epoxy resin with the same chemistry as MY 720.
MY 9612	7.5-8.5	117-134	10,000-12,000[3]	-	250	Narrow viscosity of tetra-functional epoxy resin with the same chemistry as MY 720.
MY 9634	7.5-8.5	117-134	13,000-15,000[3]	-	250	Narrow viscosity of tetra-functional epoxy resin with the same chemistry as MY 720.
MY 9655	7.5-8.5	117-134	7,000-10,000[3]	-	250	Narrow viscosity of tetra-functional epoxy resin with the same chemistry as MY 720.
MY 9663	7.4-8.6	115-135	17,000-19,000[3]	-	250	Narrow viscosity of tetra-functional epoxy resin with the same chemistry as MY 720.
Tactix® 556	4.2-4.6	215-235	1,000-1,500[4]	~53	235	Dicyclopentadiene based epoxy. Very low moisture pickup. Recommended for adhesives and composites used at elevated temperatures in a moist environment.
Tactix® 742	5.9-6.7	150-170	25-60[6]	~49	325	Trifunctional epoxy with excellent Tg and thermal stability in the cured state.
Tactix® 756	3.7-4.1	245-265	-	77-87	-	Hydrocarbon epoxy novolac resin with lower moisture absorption. Recommended for adhesives and composites used at elevated temperatures in a moist environment.

1) when cured with Aradur® 976-1; 2) 52°C; 3) 50°C; 4) 85°C; 5) 70°C; 6) 150°C; 7) 40% solution in butylcarbitol

Special resins • Matrimid® / AroCy® / Rhodeftal®

Polyimide • Matrimid®

Product	Appearance	Viscosity at 25°C [mPa s]	Melting point [°C]	Tg [DMA] [°C]	Relative thermal stability	Comments/Applications
Matrimid® 5218	Powder	0.62-0.68[1]	-	300	••	Soluble thermoplastic polyimide powder. Very high Tg. Excellent high temperature properties for use in structural composites and adhesives.
Matrimid® 9275	Powder	0.62-0.68[1]	-	300	••	Micropulverized version of Matrimid® 5218.
Matrimid® 5292A	Yellow, crystalline powder	-	150-160	295	•••	Widely used curable thermoset resin system with excellent long-term thermal stability. Continuous use in moist environment up to 180°C. Used with Matrimid® 5292B.
Matrimid® 5292B	Amber liquid	15,000-35,000	-	295	•••	Widely used curable thermoset resin system with excellent long-term thermal stability. Continuous use in moist environment up to 180°C. Used with Matrimid® 5292A.

1) 0.5% in NMP, 25°C

Cyanate ester resins • AroCy®

Product	Appearance	Viscosity at 25°C [mPa s]	% Water absorbability	Tg [DMA] [°C]	Relative thermal stability	Comments/Applications
AroCy® L-10	Amber liquid	70-100	2.4	258	••	Very low moisture absorption and low emission products, associated with excellent dielectric properties and thermal performance. Large range of resins available (aspect, Tg, final properties like toughness).
AroCy® XU 366	Semi-solid	400-1,000[1]	0.7	192	••	
AroCy® XU 371	Semi-solid	300-600[2]	3.8	371	••	
AroCy® XU 378	Semi-solid	600-1,000[2]	0.7	190	••	

1) 65 °C; 2) 82 °C

Polyamide-imide (PAI) • Rhodeftal®

Product	Viscosity at 25°C [mPa s]	Solids [%]	Solvent	Tg [DMA] [°C]	Relative thermal stability	Comments/Applications
Rhodeftal® 200	2,500-4,000	27-29	NMP	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, protective varnishes, and high temperature impregnation varnishes.
Rhodeftal® 311	2,500-4,000	23-25	NMP/Xylene	280	•••	

Hardeners • Aradur®

Product	Viscosity at 25°C [mPa s]	Amine value [mg KOH/g]	Colour [Gardner]	H+ Equivalent [g/Eq]	Typical mix ratio [g/100g GY 250]	Gel time[1] [min]	Comments/Applications
Polyamine based hardeners • Aradur®							
Aradur® 14	400-600	350-390	≤5	75	40	17	Low moisture-sensitivity, high reactivity. Used for solvent free coating, flooring and mortar. Suitability for use with drink water systems.
Aradur® 15	100-300	195-215	≤3	140	75	20	Flexibility, high reactivity, low water absorption.
Aradur® 16	550-750	380-400	≤5	75	40	15	High reactivity, to speed up slow hardeners. Low moisture sensitivity. Suitable for solvent free coating, mortar and adhesives.
Aradur® 43	290-450	260-280	≤4	115	60	45	High chemical resistance, suitable for food contact.
Aradur® 45	4,000-7,000	310-330	≤4	185	100	<10	Used for flexible adhesives and jointing compounds, mortar, casting resins and solvent free coatings.
Aradur® 51	20-40	440-480	≤3	67-90	35-48	20	Used for very highly filled mortar floorings and fillers/mastics. To decrease viscosity of viscous hardeners.
Aradur® 53S	300-400	250-280	≤1	115	60	21	High chemical resistance, very good surface properties, nearly non-yellowing.
Aradur® 70	16,000-27,000	65-75	≤5	900	400-475	300-500	Used for highly flexible adhesives, rubber-filled floorings, and liquid films as sealants. Flexible to minus 40°C.
Aradur® 75	3,000-5,000	120-140	≤4	250	133	48	Used for highly flexible adhesives, rubber-filled floorings, liquid films as sealants. Better heat stability than Aradur® 70.
Aradur® 76	1,100-1,900	160-190	≤6	250	133	45	Highly flexible, even down to 0 °C. For floorings in cold storage, sealing membranes, joint sealants, adhesives. Not moisture-sensitive. Low viscosity.
Aradur® 3275	200-300	100-170	≤6	250	129[7]	86[8]	Nonylphenol-free. Highly flexible, even down to-10 °C. Distinctly lower viscosity than Aradur® 75 and even than Aradur® 76. For the production of nonylphenol-free viscoplastic binder systems, impact-elastic coatings, crack-covering membranes and liquid foils for sealing purposes.
Aradur® 90	10,000-16,000	-	≤3	200	100-120	4-5 (20g)	Polymercaptane. Extremely rapid cure. For adhesives, filling compounds, repair mortars.
Aradur® 835	600-1,200[3]	180-210	≤5	200	115	>1,200[2]	For absolutely non-blush solvent based coatings. FDA-and BGA approved for contact to foodstuffs.
Aradur® 837	2,900-3,600	395-415	≤2	66	35	15	High reactivity, speeds slow hardeners with no negative effect. Tackyness can be eliminated by formulation.
Aradur® 847	150-300	350-375	≤2	75	40	30	For solvent free coatings for lining containers in contact with potable water and non-fatty food.
Aradur® 3484	300-550	350-450	≤6	95	50	30	All purpose hardener for SL flooring applications, good abrasion resistance. Recommended with Araldite® PY 3483.
Aradur® 2863-1	50-250	-	≤18	6-38	3-20[7]	-	Liquid, solvent-free, latent, warm-curing catalytically active hardener.
Aradur® 943	3,400-5,000	730-840	≤5	38	20	10	For the formulation of solvent free coatings with good resistance to alcohols. Tackyness can be eliminated by formulation.
Aradur® 956-2	290-500	1,020-1,080	≤4	47	25	35	Low viscosity amine adduct, light colored, very reactive. For room temperature curing adhesives.
Aradur® 2958	190-250	954-999	≤7	33	18	8	Very fast curing, for mortar, adhesives and chemically resistant solvent free coatings.
Aradur® 2963	30-70	325-350	≤2	85	45	40	Very low viscosity, formulated light-coloured hardener for self levelling floorings and mortar (phenol-free).
Aradur® 2965	100-300	300-325	≤4	94	50	35	Very low viscosity hardener for self levelling floorings and mortar. Good cure down to 5°C. Lowest tendency to waterspotting.
Aradur® 2973	900-1,400	300-335	≤7	85	45	35	Possible replacement of aromatic amines. Same blush free cure. Higher flexibility and resistance to inorganic acids, lower resistance to organic acids. With EPN 1183 very good fuel resistance.
Aradur® 2992	10-20	575-605	≤2	55	30	5	Very fast curing, for adhesives repair mortars and injection systems used with BY 158 or GY 783.
Aradur® 3224	30-90	300-320	≤1	~76	40	130	Very low viscosity and low reactivity hardener for self levelling floorings and mortar. Suitable for hot countries or extending gel time of other fast amine hardeners.
Aradur® 3225	150-250	310-340	≤2	~75	40	48	Medium reactivity as general purpose grade hardener for self-levelling flooring. Outstanding resistance to amine blushing and water spots.
Aradur® 3226	160-240	320-350	≤2	~76	40	25	Fast curing for winter application or to speed up other slow amine hardeners for self-levelling flooring. Very good surface aspect, excellent resistance to amine blushing and water spots.
Aradur® 3233	130-190	300-340	≤1	~75	40	50	Very light colour and excellent yellowing resistance. Outstanding resistance to amine blushing and water spots. Suitable for colour stone floors, handicraft products, adhesives and insulation materials.
Aradur® 3229	165-210	460-500	≤1	~80	40	~9	Very fast curing for winter application or to speed up other slow amine hardeners for self-levelling flooring.
Aradur® 265-1	2,700-10,000	-	≤10	94	50	49[6]	Exceptional resistance to H_2SO_4 (96-98%) used with EPN 1138 .
Aromatic amine based hardeners • Aradur®							
Aradur® 830	3,800-5,800	260-285	≤10	114	60	>300	With Aradur® 850 for solvent free coatings or adhesives with high chemical resistance (organic acids). Extremely long pot life. Absolutely no blushing.
Aradur® 850	15,000-21,000	245-270	≤12	120	65	15	With Aradur® 830 for solvent free coatings or adhesives with high chemical resistance (organic acids). Extremely long pot life. Absolutely no blushing.
Aradur® 2969	700-900	260-280	≤12	114	60	90	For solvent free coatings with high chemical resistance (organic acids and also fuels). Absolutely no blushing.
Aradur® 863 XW 80	9,000-11,000	300-345	≤12	96	51	412	For solvent based and high solid coatings. Absolutely no blushing, very high resistance to organic acids. With Aradur® 943 or Aradur® 22 to resist even crude methanol.
Phenalkamine • Aradur®							
Aradur® 3440	1,000-3,000	475-505	≤17	~80	43	35	For fast-curing solvent-free anticorrosion coatings. Can blush.
Aradur® 3441	10,000-50,000	290-325	≤17	~130	80	60	For fast-curing solvent-based or HS marine coatings. Low blush. To make no-blush adducts.
Aradur® 3442	1,000-5,000	320-350	≤17	~125	60	35	Low-viscous version of Aradur® 3441.
Aradur® 3460	2,000-5,000	305-335	≤17	120	65	-	For high solids and solvent-free marine coatings down to 0°C. Non-blush under difficult conditions. (Ballast-tank coating in winter.)
Aradur® 3467 XW 70	1,000-3,000	170-210	≤18	180-220	-	120	Phenalkamine adduct for fast-curing solvent-based or high solids marine coatings.
Pure Amine • Aradur®							
Aradur® 21	≤10	680-720	≤1	40	21	60	Aliphatic polyamine. Mostly in formulated form for solvent-free coatings, solvent-free self-levelling floorings and mortars.
Aradur® 22	≤8	810-830	≤2	34	18	60	Aliphatic polyamine. Mostly in formulated form for solvent-free coatings, solvent-free self-levelling floorings and mortars.
Aradur® 40	80-100	460-480	≤1	60	31	450	Cycloaliphatic polyamine. Mostly in formulated form for solvent-free coatings, solvent-free self-levelling floorings and mortars.
Aradur® 42	10-20	645-665	≤1	42	22	120	Cycloaliphatic polyamine. Mostly in formulated form for solvent-free coatings, solvent-free self-levelling floorings and mortars.

Product	Viscosity at 25°C [mPa s]	Amine value [mg KOH/g]	Colour [Gardner]	H+ Equivalent [g/Eq]	Typical mix ratio [g/100g]	Gel time[1] [min]	Comments/Applications
Polyamidoamine • Aradur®							
Aradur® 100	700-1,100[4]	83-93	≤10	~475	100	>1000[2]	Semi-solid PAA. For solvent based coatings and as additive for hot melts.
Aradur® 115	3,100-3,700[5]	240-260	≤10	~240	50	>1000[2]	Very high viscosity. The standard product for solvent based coatings, reactive adhesives. Optimal salt spray resistance.
Aradur® 125	700-900[5]	340-370	≤10	~130	65	120	For reactive adhesives. solvent based coatings, mastics.
Aradur® 140	300-600[5]	370-410	≤10	~95	50	120	For reactive adhesives, castings, heat-resistant mortars.
Aradur® 145	2,400-4,000	380-420	≤10	~95	50	180	Coatings, mastics, mortars, adhesives, castings. Similar to Aradur® 140, but lower viscous.
Aradur® 250	400-700	425-455	≤8	~95	50	60	Low viscosity PAA for mortars, adhesives, mastics.
Aradur® 350	100-400	370-410	≤10	~95	50	180	Mortars, castings. Long pot life, good physical properties.
Aradur® 370	150-350	480-520	≤10	~95	50	70	Mortars, castings and adhesives.
Aradur® 450	1,000-2,000	250-290	≤10	115	60	60	Outstanding adhesion to wet concrete. Suitable for concrete primers, high solids coatings for corrosion protection under severe conditions and marine maintenance.
Aradur® 450S	600-1,400	270-310	≤10	115	60	36	Faster version of Aradur® 450
Aradur® 848	2,500-5,500	200-230	≤10	135~190	70-100	95	For solvent-free and high solids marine maintenance coatings and for civil engineering.
Aradur® 955	500-900	520-580	≤12	65	35	30	With Araldite® BY 157 for mat, self-levelling floorings.

Polyamidoamine and polyamine based hardeners solutions • Aradur®

Product	Viscosity at 25°C [mPa s]	Amine value [mg KOH/g]	Colour [Gardner]	H+ Equivalent [g/Eq]	Typical mix ratio [g/100g]	Solids [%]	Comments/Applications
Aradur® 100 X 60	2,100-3,500	49-57	≤10	~790	166[2]	59-61	60% Aradur® 100 solution in xylene.
Aradur® 115 X 70	750-1,250	168-182	≤10	~340	70[2]	69-71	70% Aradur® 115 solution in xylene.
Aradur® 422 XW 70	6,000-12,000	140-170	≤10	~340	70[2]	69-71	Polyamidoamine adduct in xylene/n-butanol (3:2). Tack-free cure up to 70% humidity.
Aradur® 423 XW 60	800-1,400	122-138	≤10	~520	110[2]	59-61	Polyamidoamine adduct in xylene/n-butanol (4:1). Tack-free cure up to 80% humidity.
Aradur® 424 XW 50	600-2,400	80-110	≤10	~785	165[2]	49-51	Polyamidoamine adduct in xylene/n-butanol (4:1). Tack-free cure up to 100% humidity.
Aradur® 460 J 90	2,500-5,500	240-270	≤10	190	100	82-84	For high solid coatings, mortars, concrete adhesives, extreme humidity, underwater coatings.
Aradur® 30 XWM 55	2,000-2,800	104-120	≤8	~370	74[2]	54-56	Non-blush solvent based coatings. Fast cure, good chemical resistance, particularly with EPN resins. FDA-/BGA approved for food contact.
Aradur® 3776 XW 55	1,500-2,500	100-120	≤8	350	185	54-56	Similar to Aradur® 30 XWM 55 BD, but no methoxypropanol. It is Aradur® 835 in solution. Free amine content < 0.9%.

1) Tecam 250g GY 250 at 23°C; 2) with GT 7071; 3) 30% xylene/n-butanol (1:1) solution; 4) 150°C; 5) 75°C; 6) 110g GY 6010 at 23°C; 7) with GY 783; 8) Tecam 250g GY 783 at 23°C

Latent hardeners • Aradur®

Product	Supply form	Mean particle size [µm]	Softening point [°C]	H+ Equivalent [g/Eq]	Gel time[1] [min]	Comments/Applications
Aradur® 2844	Powder	<75	139-143[2]	37	10[3]	Dicyandiamide derivative with good solubility in epoxy resins providing excellent transparency in clear coats. Outstanding flow, high gloss, good mechanical strength and good chemical resistance.
Aradur® 3082	Granulate	-	73-83	230-250	73 sec[4]	Suitable for low temperature and rapid (at high temperature) curing powder coatings with good flow, high solvent, chemical and corrosion resistance.
XB 3086	Flakes	-	84-94	-	48 sec[5]	Used to formulate low bake (approx. 120°C), fast curing powder coatings.
Aradur® 3088	Coarse powder	-	85-105[2]	-	41 sec[6]	Solid epoxy amine adduct with high reactivity. Used as an accelerator and a co-hardener for epoxy powder coatings.
Aradur® 3261-1	Granulate	-	90-100	-	50 sec[5]	Solid epoxy amine adduct with high reactivity designed for low temperature (<150°C) cure of epoxy powder coatings.
Aradur® 9690	Flakes	-	100-105	~ 115	-	Cresol novolac hardener used in combination with multifuctional epoxies such as Araldite® ECN 1299 for the formulation of high temperature and chemical resistant powder coatings.
Aradur® 9506	Powder	-	90-100	35	10	Modified polyamide hardener. Excellent shelf life with a six month latency at room temperature. Excellent adhesion, good mechanical, highly reactive at 100°C. Suitable for one part adhesive, tooling, vinyl plastisols, dipping compounds.
Aradur® 976-1	White to off-white powder	<150	174-178	63	180	4,4'-DDS. Excellent high temperature and chemical resistance. Suitable for adhesives, prepregs, composites and PWB laminates.
Aradur® 9664-1	Tan colored powder	<64	174-178	63	180	Micropulverized 4,4'-DDS. Excellent high temperature and chemical resistance. Suitable for adhesives, prepregs, composites and PWB laminates.
Aradur® 9719-1	White to off-white powder	<60	165-175	63	-	Micropulverized 3,3'-DDS. Excellent high temperature and chemical resistance. Suitable for adhesives, prepregs, composites and PWB laminates.
Aradur® 5200	Clear, brown liquid	-	-	45	480[7]	Low viscosity liquid aromatic amine for adhesives, filament winding and RM application.
Hardener XB 3123	Fine powder	-	180-250[2]	-	37 sec[5]	High reactive hardener for low bake temperature powder coatings with excellent storage stability.
DY 9577	Amber or brown semi-solid	-	26-35[2]	-	10[8]	High activity above 120°C used for casting, encapsulation, filament winding, pultrusion, molding and electrical tape application

1) with GY 6010, 100°C; 2) Melting point; 3) 120°C; 4) with GT 1999, 180°C; 5) with GT 6063, 180°C; 6) with GT 7013, 150°C; 7) with GY 6010, 35°C; 8) with GY 6010, 130°C

Can & coil coating system: curing agents • Aradur®

Product	Supply form	Viscosity at 25°C [mPa s]	Solids [%]	Colour [Gardner]	Acid number [mg KOH]	Flash point [°C]	Comments/Applications
Aradur® 945-2	Clear liquid	300-500	55-60	≤18	-	≥35	Bisphenol-A resol hardener for can coatings with the following advantages when compared to standard phenol-formaldehyde hardeners: superior shelf life, lower odour when stoving, no flavour tainting, higher chemical resistance. Intense gold colour.
Aradur® 949-2	Clear liquid	100-200	53.5-56.5	≤6	-	≥40	Similar to Aradur® 945-1, with lower reactivity, pale colour. FDA listed.
Aradur® 3380-1	Flakes	-	100	≤8[1]	500-540	≥200	Special acid anhydride hardener for white pigmented can coatings that stay white even after contact with strong staining foodstuffs. FDA listed.

1) 50% solution in methoxypropylacetate

Accelerators

Product	Viscosity at 25°C [mPa s]	Amine value [mg KOH/g]	Colour [Gardner]	H+ Equivalent [g/Eq]	Softening point [°C]	Comments/Applications
Accelerator 960-1	120-250	560-675	≤8	~20	-	Tertiary amine accelerator for polyamine, polyamidoamines and anhydrides.
Accelerator 2950	2,000-6,000	640-700	≤10	~75	-	Stable with all Aradurs. In type 1 EP/PAA same effect as Accelerator 960-1, but double the potlife. Solvent-free systems open to foot traffic in less than a day at 5°C.
Accelerator 3130	10-100	-	≤3	-	-	Extreme, unique speeding of drying time (less than half an hour).
DT 3126-2	Fine powder	-	White	-	100-110[2)]	Accelerator for hybrid, polyester/TGIC, polyester/Araldite® PT 910 and polyester/Araldite® PT 912 powder coatings.
XB 5730	-	-	-	-	-	Latent microgel carried imidazole type accelerator with excellent resistance against shear forces.
DY 070	1-5	-	≤3	-	-	Heterocylic amine. Used with anhydride hardeners to improve reactivity.

Additives

Crosslinker for powder coatings

Product	Supply form	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Melting point (DSC) [°C]	Comments/Applications
PT 710	Pellets (dust free)	8.80-9.80	102-114	84-98	General purpose TGIC crosslinker in granules for the formulation of weatherable polyester powder coatings.
PT 810	Pellets (dust free)	9.3-10.00	100-108	88-98	TGIC crosslinker in low dust supply form suitable for high quality weatherable polyester powder coatings.
PT 910	Granulate	6.50-7.10	141-154	90-102	Multifunctional glycidylester crosslinker for TGIC free weatherable polyester powder coatings.
PT 912	Granulate	6.50-7.10	141-154	82-96	High quality multifunctional glycidylester weatherable epoxy crosslinker with higher functionality than Araldite® PT 910.

Matting agents for powder coatings

Product	Supply form	Softening point [°C]	Flash point [°C]	Comments/Applications
DT 125-2	Fine powder	59-71[1)]	≥200	Solid, wax-free, non-yellowing matting agent for epoxy/polyester hybrid and for polyester/Araldite® PT 810 powder coatings. The gloss range covered is >35 for hybrids and >70 for Araldite® PT 810 based systems.
DT 3329-1	Coarse powder	109-117[2)]	≥200	Wax containing matting agent for weatherable polyester as well as for epoxy/polyester hybrid powder coatings. The gloss range covered is >25 for hybrids; >40 for polyester/Araldite® PT 810 based systems and >65 for polyester/Araldite® PT 910 or Araldite® PT 912.
DT 3330	Fine powder	127-137[2)]	>250	Solid, wax-free matting agent for weatherable, non-yellowing polyester powder coatings cured with Araldite® PT 912 in the gloss range 60–80 or for low gloss dry blend systems.
DT 3360	Fine powder	120-135[2)]	>250	Solid, wax-free, non-yellowing matting agent for epoxy/polyester hybrid powder coatings in the gloss range 15–40.

Additives for coatings

Product	Supply form	Epoxy index [Eq/kg]	Flash point [°C]	Comments/Applications
DW 1765	Paste	1.20-1.60	>100	Mostly eliminates or greatly reduces exudation / blushing / tackyness and sensitivity to water (water spotting).

1) ISO11357-3; 2) DIN 51920

Waterborne System: Hardeners • Aradur®

Product	Viscosity at 25°C [mPa s]	Amine value [mg KOH/g]	H+ Equivalent [g/Eq]	Colour [Gardner]	Solids [%]	Comments/Applications
Aradur® 35	19,000-35,000	100-120	~380	≤6	51-55	Polyamine adduct in water with fast low-temperature cure.
Aradur® 36	4,000-7,000	185-225	~165	≤6	79-81	Polyamine adduct in water with good handling and flow. Suitable for waterborne coating and ECC. High solid content.
Aradur® 38	17,000-23,000	170-210	~150	≤6	79-81	Polyamine adduct in water with good handling and flow. Suitable for waterborne coating and ECC.
Aradur® 39	12,000-20,000	120-140	~335	≤5	49-51	Polyamine adduct in water with long pot life, fast cure. (Not recommended with solid resin).
Aradur® 429 Z 75	10,000-20,000	210-240	~190	≤10	74-76	Polyamidoamine adduct in ethanol/sopropanol/Shellsol A (2:2:1).
Aradur® 435	13,000-23,000	160-200	~250	≤10	49-51	Polyamidoamine adduct in water for waterborne coatings and adhesives.
Aradur® 340	18,000-23,000	155-175	~210	≤12	49-51	Polyamidoamine in water with particularly good adhesion and flexibility.
Aradur® 3985	2,000-6,000	170-210	~265	≤6	54-56	Modified polyamine adduct in water. Suitable for flooring and mortar.
Aradur® 3985S	4,000-8,000	200-250	~210	≤6	54-56	Similar to Aradur® 3985, fast cure. Suitable for flooring and mortar.
Aradur® 3986	15,000-35,000	90-110	~415	≤6	39-41	Modified polyamine adduct in water for the formulation of water-based coatings for application to mineral and metallic substrates. No flash rust inhibitor necessary.
Aradur® 23919	110,000-145,000	-	~355	light yellow	26-30	Polyamidoamine aqueous dispersion for ambient cure with Araldite® GY 23919 in 1:1 mix ratio for multipurpose concrete coating applications.

Waterborne System: PU flooring • Arathane®

Product	Appearance	NCO value %	Acidity ppm HCL	Viscosity at 25°C [mPa s]	Flash point [°C]	Comments/Applications
Arathane® 3102	Brown liquid	29.5	< 300	275	222	Modified diphenyl methane diisocyanate (MDI) which is readily emulsifiable in water without the addition of surface active agents. It can be used as a water borne primer or as a concrete sealer in flooring application. It can also be used as an aggregate binder.

Waterborne system: epoxy resins • Araldite®

Product	Epoxy index [Eq/kg]	Epoxy equiv. [g/Eq]	Viscosity at 25°C [mPa s]	Colour [Gardner]	Solids [%]	Comments/Applications
PY 340-2	5.50-5.80	172-182	6,000-8,000	≤3	100	Dispersible in water, non-crystallizing. Used for waterborne coating and ECC.
PZ 323	4.00-4.50	222-250	Slightly thixotropic	white	75-78	Aqueous dispersion of polyfunctional EPN resin with good abrasion resistance, toughness and chemical resistance. Used for coatings, adhesives, fiber-sizing, textiles and paper treatment.
PZ 756/67	~3.55	~282	~ 5000 at 20 °C, thixotropic	white	66-68	Aqueous dispersion of liquid non-crystallizing resin.
PZ 3961	1.82-2.04	925-1,040	400-750[1)]	white	51-55	Aqueous dispersion of low molecular weight solid resin.
PZ 3901	1.77-1.98	505-565	7,000-20,000	white	53.5-56.5	Aqueous dispersion of Type-1 solid resin[2)]. Used for coatings, adhesives, fiber-sizing, textiles and paper treatment.
PZ 3907-1	0.45-0.57	1,800-2,200	8,000-20,000	white	52-55	Aqueous dispersion of Type-7 solid resin[2)]. Used for coatings, adhesives, fiber-sizing, textiles and paper treatment.
PZ 3921	1.47-164	610-680	250-450	white	49-51	Formulated waterborne epoxy emulsion designed for ambient temperature curing coatings in combination with a carboxyl-functional acrylic latex or waterborne amine Hardeners.
ECN 1400	4.00-4.50	220-250	900-1,500	white	39-41	Aqueous dispersion of polyfunctional ECN resin with improved adhesion, temperature and chemical resistance. Used for coatings, adhesives, fiber-sizing, textiles and paper treatment.
GY 23919	3.08-3.28	305-325	20,000-30,000	white	60-66	Aqueous dispersion for ambient cure with Aradur 23919 in 1:1 mix ratio for multipurpose concrete coating applications.

1) 23°C; 2) in water and 2-propoxyethanol

Binders for printing inks and varnishes • Eurelon®

Product	Softening point [°C]	Melting viscosity [Pa s]	Amine value [mg KOH/g]	Acid value [mg KOH/g]	Colour [Gardner]	Comments/Applications
Co-solvent soluble polyamide resins (for flexo-and rotogravure printing) • Eurelon®						
Eurelon® 930	105-115	2.1-2.7 at 165°C	<6	<8	<10	Copolyamide
Eurelon® 931	105-115	1.8-2.8 at 165°C	<5	<6	<10	Copolyamide
Eurelon® 946	98-108	0.6-1.3 at 165°C	<9	<7	<10	Copolyamide
Eurelon® 964	143-153	0.05-0.15 at 160°C	<6	<6	<10	Copolyamide
Eurelon® 970	105-115	1.3-2.1 at 160°C	<6	<5	<10	Copolyamide
Eurelon® 990	105-115	1.7-2.7 at 165°C	<3	<12	<9	Copolyamide
Ethanol soluble polyamide resins (for flexo-and rotogravure printing) • Eurelon®						
Eurelon® 965	109-119	0.40-1.0 at 160°C	<5	<6	<10	Copolyamide
Eurelon® 969	97-107	0.40-0.70 at 160°C	<8	<5	<15	Copolyamide
Eurelon® 975	171-181	9.0-13.0 at 230°C	<5	<6	<8	Copolyamide
Polyamide resins with good "slip" and "release" properties (for flexo-and rotogravure printing) • Eurelon®						
Eurelon® 950	92-98	0.30-0.70 at 165°C	<5	<6	<10	Copolyamide wax modified
Eurelon® 957	118-128	0.30-0.50 at 160°C	<5	<5	<10	Copolyamide wax modified

Adhesion promoters for PVC plastisols • Euretek®

Product	Viscosity [mPa s]	Amine value [mg KOH/g]	EEC Labelling	Colour [Gardner]	Comments/Applications
Euretek® 3607	9-19 at 25°C	220-245	free	≤12	Polyamidoamine preparation
Euretek® 505	1.0-1.5 at 75°C	380-400	Xi	≤12	Polyamidoamine preparation
Euretek® 531	12.5-22.5 at 25°C	180-210	Xi	≤12	Polyamidoamine preparation
Euretek® 540	2.2-4.0 at 75°C	440-500	Xi	≤12	Polyamidoamine preparation
Euretek® 547	0.1-0.3 at 50°C	200-240	Xi	≤10	Polyamidoamine preparation
Euretek® 549	5-9 at 50°C	265-305	Xn	≤12	Polyamidoamine preparation

HUNTSMAN

Enriching lives through innovation

ASIA / PACIFIC
Huntsman Advanced Materials (Guangdong) Co., Ltd.
Flying Geese Mountain Industrial Park,
Shilou Town, Panyu District,
Guangzhou City, P.R.C., 511447
Tel: +86 20 3937 7000
Fax: +86 20 8486 5122

AMERICAS
Huntsman Advanced Materials Americas Inc.
1003 Woodloch Forest Drive
The Woodlands, Texas 77380
USA
Tel: +1 888 564 9318
Fax: +1 281 719 4047

EUROPE / AFRICA
Huntsman Advanced Materials (Switzerland) GmbH
Klybeckstrusse 200
P.O. Box
4002 Basel
Switzerland
Tel: +41 61 299 11 11
Fax: +41 61 299 11 12

INDIA / MIDDLE EAST
Huntsman Advanced Materials (India) Pvt. Ltd.
5th Floor, Bldg. No. 10,
Solitaire Corporate Park
167, Guru Hargovindji Marg, Chakal
Andheri (East)
Mumbai-400093
India
Tel: +91 22 4095 1556 - 60
Fax: +91 22 4095 1300 / 1400 / 1500

www.huntsman.com/advanced_materials

Ref. Nr. AdMat_SCG_05/09_EN