HUNTSMAN

Enriching lives through innovation

Advanced Materials

Protection, safety and sustainability

Encapsulation and insulation systems

Selector guide

Definitions of properties

Properties	Standards	Definitions
Density ϱ	ISO 1183	The ratio of the mass m of a sample to its volume V (at the temperature t), expressed in kg/m³, kg/dm³ (g/cm³) or kg/l (g/ml)
Viscosity	ISO 2555	Measure of the resistance to flow of a fluid under an applied force
Gel time	ISO 9396	Time taken for a material to solidify or become extremely viscous
Glass transition temperature	ISO 11357-2	The approximate midpoint of the temperature range over which an amorphous material undergoes a reversible change from (or to) a viscous or rubbery state to (or from) a hard and relatively brittle one
Thermal conductivity λ	ISO 8894-2	The density of heat flow rate divided by the temperature gradient. Thermal conductivity is expressed in watts per metre kelvin (W/mK)
Temperature index	IEC 60216 UL 746B	The temperature index (TI) is a measurement for the thermal stability. It provides the basis for classifying an insulating material into a thermal class. The TI allows different insulation materials to be compared, but only if the same end point criterion is applied (e.g. weight loss 10 %, flexural strength 50 %). The higher the TI, the better is the thermal behavior of the material
Thermal class	IEC 60085	Thermal classes Y = 90 °C, A = 105 °C, E = 120 °C, B = 130 °C, F = 155 °C, H = 180 °C, N = 200 °C, R = 220 °C
Shore hardness	DIN 53505	Resistance against the penetration of a body of specified shape, applied under a specific spring load
Tensile strength	ISO 527	Maximum tensile stress sustained by a material during a tensile test (stretching)
Flexural strength	ISO 178	Maximum flexural stress sustained by a material during a bending test
Elongation at break	ISO 527	Tensile strain at which the material breaks
Modulus of elasticity	ISO 527	Stress σ required to produce unit strain ϵ, E = σ/ϵ (Young's Modulus)
Water absorption	ISO 62	Determination of weight after immersion compared with dry weight
Dielectric dissipation factor tan δ	IEC 60250	The dielectric dissipation factor tan δ of a material indicates the electrical losses of the dielectric. It is the tangent of the dielectric loss angle δ. The dielectric loss angle δ of an insulating material is the angle by which the phase difference between applied voltage and resulting current deviates from 90 degrees, when the dielectric of the capacitor consists exclusively of the dielectric material
Relative permittivity ϵ_r	IEC 60250	The relative pemittivity ϵ_r of an insulating material is the ratio of capacitance of a capacitor, in which the space between and around the electrodes is entirely and exclusively filled with the insulating material in question, to the capacitance of the same configuration of electrodes in vacuum. The permittivity ϵ of an insulating material is the product of its relative permittivity ϵ_r, and the electric constant (or permittivity of vacuum) ϵ_0
Dielectric strength	IEC 60243-1 IEC 60455-2 (1998)	The dielectric strength is the quotient of the breakdown voltage and the distance between the conducting parts between which the voltage is applied under prescribed test conditions

This product selector guide provides an overview on our key product systems for encapsulation and insulation of electronic components for automotive, telecom, lighting and general industry applications. Additional systems are also available.

Our sales engineers will help you to find the ideal system for your individual application and process.

Properties and performance

			Description/ chemistry	Type of system	Density of cured casting	Mixing ratio	Viscosity		
							resin	hardener	mixture
Conditions						resin/hardener	25 °C		
Unit					g/cm³	pbw	mPa·s		
Araldite® CY 221 Aradur® HY 2966	High flexibility	●	Multipurpose epoxy system	unfilled	1.10	100/25	450	500	490
Arathane® CW 5650 Arathane® HY 5610		●	Non-abrasive polyurethane system	prefilled	1.46	100/11	3500	100	4000
XB 5601-1 XB 5600		●	UV-flexible polyurethane system	unfilled	0.97	100/100	500	1200	1000
Arathane® XW 949-1 Arathane® HY 5610		●	Low-temperature flexibility polyurethane system	unfilled	1.00	100/50	5550	90	1800
Araldite® CW 2243-2L Blue Aradur® HY 1872		●	Low-temperature flexibility epoxy system	prefilled	1.45	100/22	8000	150	4400
VB U6942 VB U001/B		●	Multipurpose polyurethane system	prefilled	1.49	100/16	5000	120	2500
Arathane® CW 5620 Arathane® HY 5610		●	High-end polyurethane for automotive applications	prefilled	1.44	100/22	2500	90	1300
Araldite® CW 5730 N Aradur® HY 5731		●	Flexible impregnation epoxy system class F	prefilled	1.59	100/28	90000	800	7000
Araldite® CW 2243-2L Aradur® HY 2966		●	Multipurpose epoxy system	prefilled	1.58	100/11	8000	150	4400
Arathane® CW 5631 Arathane® HY 5610		●	Cold-curing class F polyurethane system	prefilled	1.52	100/25	10000	90	3000
Araldite® DBF Aradur® HY 956 EN		●	Multipurpose epoxy system	unfilled	1.10	100/20	1500	420	1800
VB U 6910 Slow Arathane® HY 5611-1		●	Halogen-free polyurethane system	prefilled	1.52	100/25	3500–7000	180–240	3300
Araldite® XB 2252 Aradur® XB 2253		●	Cold-curing class F epoxy system	prefilled	1.54	100/13	7500	300	2300
Araldite® CW 1116-1 Aradur® HY 2123		●	High-service temperature epoxy impregnation system	prefilled	1.62	100/31	30000	75	400 at 40 °C
Araldite® CW 1446 BDF Aradur® HY 2919		●	Multipurpose epoxy impregnation system	prefilled	1.66	100/24	20000	75	3500
Araldite® CW 5725 Aradur® HY 5726		●	High-service temperature epoxy for ignition coils	prefilled	1.71	100/28	8000 at 60 °C	70	420 at 60 °C
Araldite® 5763 Aradur® HY 5726		●	High-performance epoxy system for car ignition coils	prefilled	1.65	100/26	14000 at 60 °C	70	600 at 60 °C
Araldite® CW 1302 Aradur® HY 1300		●	High-thermal-conductive epoxy system	prefilled	1.65	100/11	38000	190	10000
XB 2710 XB 2711	Low flexibility	●	Hot-curing epoxy casting system	prefilled	2.10	100/100	11500	45000	8000 at 60 °C

● Hot-curing system
● Cold-curing system

	Pot life	Gel time	Minimum curing time	Glass transition temperature	Thermal conductivity	Flammability UL 94	Thermal class	Shore hardness	
	Viscosity increase up to 15000 mPa·s				25 °C			23 °C	
	min	min	h	°C	W/mK			Shore D	
	117 at 25 °C 54 at 40 °C	45 at 40 °C 10 at 60 °C 4 at 80 °C	24 at 25 °C	25	0.15	no	E	25	
	15 at 25 °C	40 at 60 °C	24 at 25 °C or 6 at 80 °C	-47	0.50	V-0; 6 mm	E	78 (Shore A)	
	22 at 25 °C	16 at 25 °C	24 at 25 °C or 6 at 80 °C	22	0.20	no	E	27	
	35 at 25 °C	50 at 25 °C	24 at 25 °C or 6 at 80 °C	-62	0.19	no	B	20	
	46 at 60 °C	110 at 60 °C	2 at 80 °C	8	0.53	no	E	20	
	40 at 25 °C	60 at 25 °C	24 at 25 °C or 6 at 80 °C	20	0.55	V-0; 6.4 mm	E	40	
	45 at 25 °C	70 at 25 °C	24 at 25 °C or 6 at 80 °C	20	0.50	V-0; 6 mm	B	40	
	380 at 60 °C 115 at 80 °C	145 at 80 °C 36 at 100 °C	3 at 80 °C + 6 at 100 °C	25	0.61	V-0; 6 mm	F	65	
	40 at 25 °C	17 at 60 °C	24 at 25 °C + 2 at 60 °C	37	0.80	V-0; 6 mm	B	70	
	30 at 25 °C	60 at 25 °C	24 at 25 °C or 6 at 80 °C	47	0.60	V-0; 6 mm	F	80	
	120 at 25 °C 62 at 40 °C	62 at 40 °C 15 at 60 °C	24 at 25 °C or 4 at 25 °C + 6 at 60 °C	64	0.15	no	E	80	
	70 at 25 °C 45 at 40 °C	100 at 25 °C	24 at 25 °C or 6 at 80 °C	55	0.61	V-0; 6 mm	B	82	
	37 at 25 °C	100 at 25 °C 60 at 40 °C 30 at 60 °C	24 at 25 °C + 2 at 60 °C	65	0.66	V-0; 6 mm	F	86	
	90 at 80 °C	23 at 100 °C	2 at 70 °C + 4 at 110 °C	122	0.55	V-0; 6 mm	F	90	
	220 at 60 °C	3 at 140 °C	6 at 60 °C + 6 at 100 °C	92	0.67	V-0; 6 mm	H	90	
	480 at 60 °C 130 at 80 °C	160 at 80 °C 80 at 90 °C	2.5 at 90 °C + 2.5 at 140 °C	144	0.65	no	H	90	
	480 at 60 °C 130 at 80 °C	300 at 70 °C 160 at 80 °C 80 at 90 °C	2 at 85 °C + 2 at 130 °C	135	0.70	no	H	90	
	34 at 25 °C 28 at 40 °C	120 at 25 °C 75 at 40 °C 30 at 60 °C	24 at 25 °C + 2 at 60 °C	75	0.83	V-0; 3.2 mm	H	80	
	400 at 60 °C	35 at 90 °C 20 at 100 °C 7 at 120 °C	1 at 90 °C 1.5 at 140 °C	120	1.50	V-0; 12 mm	H	92	

Please note that the values given in this selector guide are typical values determined by testing standard test specimens. They are not directly indicative of the in-service performance of a casting. Therefore, before initiating a production run, manufacturers are advised to carry out their own preliminary tests using preproduction models.

	Tensile strength / flexural strength	Elongation at break	Modulus of elasticity	Water absorption		Dielectric dissipation factor tan δ	Relative permittivity	Dielectric strength	Color
	23 °C	23 °C	23 °C	10 d / 23 °C	30 min / 100 °C	50 Hz / 23 °C	50 Hz / 23 °C	2 mm plate / 23 °C	
	MPa	%	MPa	%	%	%		kV / mm	
	5 / n.a.	55	n.a.	1.80	1.20	7.2	6.1	35	transparent
	2 / n.a.	56	11	2.10	1.00	34	9.0	27	grey
	4 / 4	40	13	2.04	1.57	14.0	5.0	19	clear transparent
	4 / 3	37	16	0.20	0.41	1.0	2.9	26 (3 mm)	blue
	4 / n.a.	26	18	n.a.	0.63	14.0	8.0	22	blue
	4 / n.a.	44	26	0.50	0.29	13.0	5.5	22	beige / black
	7 / n.a.	70	21	0.50	0.33	11.0	6.0	25	black / blue
	5.6 / 6	45	50	0.43	0.27	5.0	4.9	28	black
	16 / 24	> 15	960	0.25	0.50	5.0	5.0	15	blue
	30 / 53	6	2 100	0.28	0.30	3.0	4.5	29	black
	58 / 107	12	2 900	0.63	0.65	0.8	4.1	24	transparent
	38 / 72	2	4 500	0.20 max	n.a.	2.1	4.4	20	black
	41 / 70	1.5	5 100	n.a.	0.40	4.4	4.7	29	black
	51 / 86	1.2	6 400	n.a.	0.13	1.3	4.1	16	red
	47 / 91	1.5	7 600	n.a.	0.14	4.0	1.0	25	beige
	n.a. / 90	1.4	7 800	0.08	0.05	0.5	4.2	25	black
	n.a. / 114	1.6	8 100	0.08	0.05	0.9	3.6	30	black
	30 / 63	0.5	8 400	n.a.	0.22	6.4	4.9	27	beige
	n.a. / 78	0.6	13 000	n.a.	n.a.	1.2	4.7	25	brown

Huntsman Advanced Materials

We are 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 day by day.

More than 9 000 companies around the world use Huntsman Advanced Materials technologies in key markets such as adhesives and inks, aerospace, automotive, coatings, construction, electronics, medical, marine, power transmission and distribution, sports equipment and wind power generation.

Encapsulation and insulation market

Huntsman Advanced Materials is a leading global supplier of high-performance encapsulation and insulation materials for electronic components used in automotive, lighting or general industry applications.

For more than 60 years we provide technological know-how in encapsulation and insulation of electronic components to our customers with a comprehensive range of products with proven reliability and durability like epoxy systems, polyurethanes or polyamide hotmelts. Tailor-made encapsulation and insulating systems are essential to reach the desired high-end reliability in terms of chemical, electrical and mechanical properties.

Global presence – 13 manufacturing sites

HUNTSMAN

Enriching lives through innovation

More detailed information about these products can be found on our website:
www.araldite2000plus.com
For any other information, please send an e-mail to:
araldite2000plus@huntsman.com

Europe/Africa:
Huntsman Advanced Materials (Switzerland) GmbH
Klybeckstrasse 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.
5 th Floor, Bldg. No. 10
Solitaire Corporate Park, 167
Guru Hargovindji Marg, Chakal, Andheri (East)
Mumbai – 400 093
India
Tel. +91 22 4095 1556-60
Fax +91 22 4095 1300/1400/1500

Asia/Pacific:
Huntsman Advanced Materials (Guangdong) Co., Ltd.
Rooms 4604 – 4608, Maxdo Center
8 Xing Yi Road
Shanghai, 200336
P.R. China
Tel. +86 21 2208 7588
Fax +86 21 2208 7511

Americas:
Huntsman Advanced Materials Americas Inc.
10003 Woodloch Forest Drive
The Woodlands
Texas 77380
USA
Tel. +1 888 564 9318
Fax +1 281 719 4047

Ref. No. AdMat Encapsulation 06.10_EN_EU

Concept and Design by Ramstein Ehinger Associates AG