

## Adhesives

Types of Adhesives		2-Part Adhesives			1-Part Adhesives			Dual Cure Adhesive	UV Adhesive
Product name		EPOXONIC 369	EPOXONIC 370	EPOXONIC 382	EPOXONIC 292	EPOXONIC 340	EPOXONIC 366	EPOXONIC 195	EPOXONIC 372
Colour cured product		colourless	slightly grey	slightly yellowish transparent	grey	cream	black	colourless	colourless
Mixing ratio A : B [pbw] <sup>1)</sup>		100 : 25	100 : 17	100 : 25	1K	1K	1K	1K	1K
Viscosity at 25°C [mPas]	EPOXONIC PV 1	3,500	5,500	450	220,000	20,000	80,000 6,000 ( 60 °C)	800	2,000
Pot life [h/°C] <sup>2)</sup>		1 / 25	0.5 / 25	0.5 / 25	> 7 d / 25	> 7 d / 25	3 / 60	see datasheet "Storage"	see datasheet "Storage"
Cure schedule [h/°C]		2 / 80	1 / 100 1 / 70 + 4 / 110	10 / 25 + 12 / 50	1 / 120 24 / 95	1 / 130	6 / 80 + 12 / 160	30 s / 60 mW/cm <sup>2</sup> UVA and/or 0.5 / 150	4 x 60 s / 60 mW/cm <sup>2</sup> UVA
Glass transition temperature Tg [°C]	DIN 53765	90	105	70	125	30	170	145	n.d.
Density [g/cm <sup>3</sup> ]	DIN 66137-3	1.1	1.0	1.1	1.5	1.3	1.7	1.2	1.1
Shore hardness	DIN EN ISO 868	D 80	D 80	D 85	n.d.	D 30	D 94	D 85	D 60
Coefficient of linear thermal expansion α <sub>1</sub> [ppm/K] <sup>3)</sup>	ISO 11359-2	n.d.	n.d.	n.d.	50	n.d.	30	60	n.d.
Shear strength at 25°C [MPa] <sup>4)</sup>	EPOXONIC PV 29	50	52	46	70	n.d.	n.d.	40	43 (glass)
Transmission oil resistance		n.d.	n.d.	n.d.	very good	n.d.	n.d.	n.d.	n.d.
Application/special features		Low viscosity; good adhesion to PA and other plastics; crack resistant, impact resistant	Good adhesion to PA and other plastics; crack resistant, impact resistant	Large area bonding of temperature-sensitive substrates	Stable adhesive for high loads	Potting, sealing and bonding of electronic components	High Tg adhesive; very good adhesion to ceramics/stainless steel; low thermal expansion	High strength bonding of high - quality glass	Fast, low-stress UV bonding with high impact strength

<sup>1)</sup> pbw: parts by weight

<sup>2)</sup> Time to double viscosity

<sup>3)</sup> Coefficient of linear thermal expansion below Tg

<sup>4)</sup> Substrate aluminium

n.d.: not determined

## Potting compounds

Type of curing		Moderate curing temperature								
Product name		EPOXONIC 33	EPOXONIC 281	EPOXONIC 283	EPOXONIC 374	EPOXONIC 363	EPOXONIC 341	EPOXONIC 342	EPOXONIC 389	EPOXONIC 390
Colour cured product		grey	green	black	white/grey	opaque	beige	grey	reddish transparent	greenish transparent
mixing ratio A : B [pbw] <sup>1)</sup>		100 : 22	100 : 7.5	100 : 9.5	100 : 8.5	100 : 37	100 : 9	100 : 14.4	100 : 40	100 : 34
Viscosity at 25°C [mPas]	EPOXONIC PV 1	4,000	4,000	2,500	3,500	300	2,000	2,000	200	350
Pot life [h/°C] <sup>2)</sup>		1 / 25	0.5 / 25	0.5 / 25	0.5 / 25	0.5 / 25	5 / 25	5 / 25	2 / 25	2 / 25
Cure schedule [h/°C]		7 / 60	4 / 80	Feb 70	2 / 70	2 / 60 + 2 / 100	24 / 23 + 16 / 80	6 / 60 + 4 / 80	24 / 23 + 4 / 100	24 / 23 + 4 / 100
Glass transition temperature Tg [°C] (Curing conditions [h/°C])	DIN EN ISO 11357-2	85 (7 / 60)	65 (4 / 80)	80 (2 / 70)	65 (2 / 70)	75 (2 / 60 + 2 / 100)	70 (24 / 23 + 16 / 80)	70 (6 / 60 + 4 / 80)	68 (24 / 23 + 4 / 100)	65 (24 / 23 + 4 / 100)
Density [g/cm <sup>3</sup> ]	DIN 66137-3	1.5	1.7	1.7	1.7	1.1	2.2	1.5	1.17	1.17
Shore hardness	DIN EN ISO 868	D 82	D 87	D 92	D 90	D 85	D 91	D 90	D 83	D 83
Fire behaviour UL 94	UL94 V	n.d.	V0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Thermal conductivity [W/mK]	DIN EN ISO 8894-1	0.5	1.1	0.5	n.d.	n.d.	1.3	0.5	0.2	0.2
Coefficient of linear thermal expansion α <sub>l</sub> [ppm/K] <sup>3)</sup>	ISO 11359-2	110	40	45	25	70	45	45	60	70
Tensile strength [MPa]	DIN EN ISO 527	20	35	70	70	n.d.	65	90	75	60
Elongation at break	DIN EN ISO 527	11	0.5	1.2	1.0	n.d.	0.6	1.7	3.5	3.5
E-modulus [MPa]	DIN EN ISO 527	1,200	8,600	8,400	10,000	n.d.	12,000	10,000	3,100	3,400
Water absorption [%]	DIN EN ISO 62	0.3 (30 min /100 °C)	n.d.	n.d.	0.1 (30 min /100 °C)	n.d.	n.d.	n.d.	n.d.	n.d.
Transmission oil resistance		n.d.	n.d.	n.d.	n.d.	n.d.	very good	very good	n.d.	n.d.
Dielectric strength [kV/mm]	DIN EN 60243-2	35	> 25	40	> 40	n.d.	n.d.	n.d.	n.d.	n.d.
Surface resistivity [Ωcm]	DIN EN 62631-3-2	9.6 x 10 <sup>14</sup>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Specific volume resistivity [Ωcm]	DIN EN 62631-3-2	2.3 x 10 <sup>14</sup>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Application/special features		Low stress potting of electronic devices	Potting of electronic devices; hardly inflammable; thermally conductive	Potting of electronic devices; very good mechanical properties	Potting of electronic devices; very good mechanical properties; low CTE	Transparent electronic potting; low viscosity	Very good chemical and crack resistance; potting of large-volume components with good heat dissipation	Very good chemical and crack resistance; potting of large-volume components with higher mechanical requirements	Long pot life; impregnating of fabric tapes and cords; curing at room temperature is possible	<b>"Bio-based version" of EPOXONIC 389;</b> bio-content; Long pot life; impregnating of fabric tapes and cords; curing at room temperature is possible

<sup>1)</sup> pbw: parts by weight

<sup>2)</sup> Time to double viscosity

<sup>3)</sup> Coefficient of linear thermal expansion below Tg

n.d.: not determined

## Potting compounds

Type of curing		Hot curing				
Product name		EPOXONIC 344	EPOXONIC 352	EPOXONIC 235	EPOXONIC 371	EPOXONIC 368
Colour cured product		black	black	black	white	grey
Mixing ratio A : B [pbw] <sup>1)</sup>		100 : 13	100 : 11.1	100 : 4.2	100 : 8.5	100 : 80
Viscosity at 25°C [mPas]	EPOXONIC PV 1	10,000 (25 °C) 3,000 (40 °C)	6,000	5,000	14,000	38,000 1,700 (80 °C)
Pot life [h/°C] <sup>2)</sup>		0.5 / 40	0.5 / 25	0.5 / 40	0.5 / 40	0.5 / 80
Cure schedule [h/°C]		1 / 70 + 1 / 120	2 / 110 1 / 80 + 1 / 130	2 / 60 + 2 / 110	1 / 70 + 2 / 120 3 / 60 + 1 / 150	2 / 100 + 1 / 150
Glass transition temperature Tg [°C]	DIN 53765	125	105	135	140	130
Density [g/cm <sup>3</sup> ]	DIN 66137-3	1.7	1.6	1.7	1.7	02. Jun
Shore hardness	DIN EN ISO 868	D 92	D 90	D 90	D 90	D 94
Fire behaviour UL 94	UL94 V	n.d.	V0	HB	n.d.	n.d.
Thermal conductivity [W/mK]	DIN EN ISO 8894-1	0.7	0.9	n.d.	n.d.	1.7
Coefficient of linear thermal expansion $\alpha_1$ [ppm/K] <sup>3)</sup>	ISO 11359-2	40	45	45	30	30
Tensile strength [Mpa]	DIN EN ISO 527	65	65	50 115 (flexural strength)	n.d.	n.d.
Elongation at break	DIN EN ISO 527	1.0	1.1	1.1 0.6 (fiber elongation)	n.d.	n.d.
E-modulus [MPa]	DIN EN ISO 527	8,500	8,000	5,200	n.d.	n.d.
Water absorption [%]	DIN EN ISO 62	0.13 (30 min / 100°C)	< 0.1 (24 h / 23 °C)	n.d.	n.d.	n.d.
Transmission oil resistance		very good	very good	n.d.	n.d.	n.d.
Dielectric strength [kV/mm]	DIN EN 60243-2	> 25	> 20	n.d.	n.d.	n.d.
Surface resistivity [ $\Omega$ cm]	DIN IEC 60093	$1.5 \times 10^{15}$	n.d.	n.d.	n.d.	n.d.
Specific volume resistivity [ $\Omega$ cm]	DIN IEC 60093	$2.0 \times 10^{15}$	n.d.	n.d.	n.d.	n.d.
Application/special features		High voltage application; small potting applications	Potting of electronics; crack-resistant, chemical-resistant; for small potting volumes	Potting of components processed by lead-free soldering method	Potting of electronics; crack-resistant; chemical-resistant; hot steam sterilization; high temperature requirement	Thermally conductive electronic potting; crack-resistant; high temperature requirement; thermal shock resistance; low thermal expansion

<sup>1)</sup> pbw: parts by weight

<sup>2)</sup> Time to double viscosity

<sup>3)</sup> Coefficient of linear thermal expansion below Tg

n.d.: not determined

## Flexible potting compounds

Type of curing		Hot curing				
Product name		EPOXONIC 361	EPOXONIC 364	EPOXONIC 373	EPOXONIC 375	EPOXONIC 376
Colour cured product		black	grey	black	black	black
Mixing ratio A : B [pbw] <sup>1)</sup>		100 : 210 or 1-K	100 : 150	100 : 257	100 : 120	100 : 190
Viscosity at 25°C [mPas]	EPOXONIC PV 1	7,500	80,000	50,000	65,000	6,500
Pot life [h/°C] <sup>2)</sup>	EPOXONIC PV 1	> 20 / 25	> 20 / 23	> 20 / 25	> 20	> 20 / 25 3 / 60
Cure schedule [h/°C]		2 / 150 4 / 120	2 / 90 + 4 / 120	1 / 150 4 / 120	2 / 120	1 / 150 4 / 120
Glass transition temperature Tg [°C]	DIN 53765	-45	-40	-40	-35	-40
Density [g/cm <sup>3</sup> ]	DIN 66137-3	1.1	2.4	1.6	1.7	1.1
Shore hardness	DIN EN ISO 868	A 50	A 70	A 90	A 87	A 50
Fire behaviour UL 94	UL 94 V	n.d.	n.d.	V0	n.d.	n.d.
Thermal conductivity [W/mK]	DIN EN ISO 8894-1	n.d.	1.4	1.0	n.d.	n.d.
Coefficient of linear thermal expansion $\alpha_1$ / $\alpha_2$ [ppm/K] <sup>3) 4)</sup>	ISO 11359-2	220 ( $\alpha_2$ )	n.d.	125 ( $\alpha_2$ )	135 ( $\alpha_2$ )	n.d.
Tensile strength [MPa]	DIN EN ISO 527	1.0	3.6	8	13	2.3
Elongation at break	DIN EN ISO 527	70	65	35	55	80
E-modulus [MPa]	DIN EN ISO 527	2.8	9	30	40	3.5
Water absorption [%]	DIN EN ISO 62	1.7 (7 d / 23 °C)	0.37 (0.5 h / 100°C)	0.2 (0.5 h / 100 °C) 1.7 (saturation) (85 °C / 100 % rF)	n.d.	n.d.
Transmission oil resistance		good (swelling)	good (swelling)	n.d.	n.d.	n.d.
Dielectric strength [kV/mm]	DIN EN 60243-2	n.d.	n.d.	> 16	n.d.	n.d.
Application/special features		Flexible base resin for stress-sensitive components; fast curing possible; very good oil resistance; also available as 1-K	Flexible, thermally conductive potting resin for stress-sensitive components; very good oil resistance	Low-stress potting of stress-sensitive components with high flame retardancy requirements	Low-stress potting of pressure- and vibration-sensitive components	Low-stress potting of stress-sensitive components; very good crack resistance

<sup>1)</sup> pbw: parts by weight

<sup>2)</sup> Time to double viscosity

<sup>3)</sup> Coefficient of linear thermal expansion below Tg

<sup>4)</sup> Coefficient of linear thermal expansion above Tg

n.d.: not determined