

Encapsulants | Material Selection Guide

Product	Product group		DELO-DAM&FILL			DELO-KATIOBOND			DELO-DUALBOND	
	Product code		DF570*	DF580*	DF630*	4670	GE680	DF698	GE4910	GE710*
General	Basis		epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin	mod. urethane acrylate	epoxy resin
	Color		black	black	milky white	light gray translucent	milky translucent	light gray translucent	colorless transparent	milky translucent
	Encapsulation	Fill	✓			✓				
		Dam		✓				✓		
		Glob top			✓					
	Casting						✓		✓	✓
	Application area	Smart card	✓	✓	✓	✓		✓		
Chip on board		✓	✓			✓				
Universal electronic casting						✓		✓	✓	
Curing	Curing mechanism		heat-curing	heat-curing	UV-curing	UV-curing	UV-curing	UV-curing	light- and humidity-curing	light- and heat-curing
	Curing time		2 min @ +130 °C	2 min @ +130 °C	20 s UVA 55 – 60 mW/cm²	60 s UVA 55 – 60 mW/cm²	30 s UVA 55 – 60 mW/cm²	60 s UVA 55 – 60 mW/cm²	10 s UVA 60 mW/cm²	30 s UVA 55 – 60 mW/cm² 3 min @ +150 °C
Mechanical values	Density [g/cm³]		1.6	1.6	1.5	1.4	1.8	1.4	1.00	1.5
	Viscosity [mPas]		10,000 ¹⁾	195,000 ¹⁾	7,000 ¹⁾	4,800 ¹⁾	112,000 ¹⁾	180,000 ¹⁾	2,000 ¹⁾	16,000 ¹⁾
	Tensile strength [MPa]		43	60	43	30	41	22	6	70
	Elongation at tear [%]		0.5	0.9	2	6	0.6	20	315	2
	Young's modulus [MPa]		8,000	6,800	3,400	1,700	6,900	160	17	5,300
	Shore hardness D		90	89	87	79	91	61	12	89
	Decomposition temp. [°C]		309	314	–	280	291	–	–	–
	Glass transition temp. [°C]		200 ³⁾	174 ³⁾	118 ³⁾	62 ²⁾	120 ⁴⁾	35 ²⁾	70 ²⁾	79 ⁴⁾
	Coefficient of linear expansion [ppm/K]	below Tg	55	87	88	150	32	147	235	52
		above Tg								152
Water absorption [weight %]		0.3	0.3	0.5	0.2	0.1	0.4	1.3	0.2	
Shrinkage [vol. %]		1.2	0.9	3.5	3	2	2.9	5.3	2.4	
Storage	Storage life	at room temperature	1 week	1 week	4 weeks	4 weeks	1 week	10 days	–	2 weeks
		at 0 °C to +10 °C	6 months	6 months	6 months	6 months	6 months	6 months	6 months	6 months
		at –18 °C / at –40 °C	–	–	–	–	–	–	–	–
Features	Special features of product		especially for opaque DAM&FILL encapsulation in combination with DELO-DAM&FILL DF580	especially for opaque DAM&FILL encapsulation in combination with DELO-DAM&FILL DF570	very hard encapsulation for optimal protection during module implantation	DAM&FILL system DELO-KATIOBOND 4670/DF698	thixotropic fulfills the requirements acc. to USP 30, NF25, Class IV	thixotropic DAM&FILL system DELO-KATIOBOND 4670/DF698	highly flexible curing also in shadowed areas by humidity crosslinking	casting, fixing in electrical engineering
	Halogen-free by the criteria of IEC 61249-2-21									

* customer-specific product
¹⁾ Brookfield viscosimeter
²⁾ rheometer
³⁾ DMTA
⁴⁾ TMA
⁵⁾ DSC

DELO-DUOPOX			DELO-PUR	DELOMONOPOX							
CR716	CR804	AD894	CR901*	6093	6095	GE725	GE727	GE730	GE765	GE785	MG063
2C epoxy resin	2C epoxy resin	2C epoxy resin	2C poly-urethane	epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin	epoxy resin
black	yellowish transparent	black	light beige	black	black	black	black	black	black	black	black
						✓	✓				
										✓	
✓	✓	✓	✓	✓	✓		✓				✓
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
heat-curing	room temperature	room temperature	room temperature	heat-curing	heat-curing	heat-curing	heat-curing	heat-curing	heat-curing	heat-curing	heat-curing
20 min @ +150 °C 60 min @ +130 °C	firmness to touch: 7.5 h final strength: 45 min @ +80 °C	firmness to touch: 5 h final strength: 24 h	final strength: 48 h	30 min @ +130 °C air convection oven	30 min @ +130 °C air convection oven	20 min @ +150 °C 90 min @ +125 °C	20 min @ +150 °C 90 min @ +125 °C	20 min @ +150 °C 90 min @ +125 °C	20 min @ +150 °C 90 min @ +125 °C	20 min @ +150 °C 90 min @ +125 °C	30 min @ +150 °C air convection oven
1.69	1.07	1.31	1.23	1.2	1.2	1.6	1.85	1.6	1.7	1.7	1.2
12,000 ²⁾	1,000	16,000 ¹⁾	c. A: 14,000 ¹⁾ c. B: 40 ¹⁾	40,000 ¹⁾	50,000 ¹⁾	6,500 ²⁾	11,000 ²⁾	9,000 ²⁾	22,000 ²⁾	135,000 ²⁾	180,000 ¹⁾
36	11	41	5	41	45	50	59	60	60	55	35
0.6	60	2.1	65	1.6	1.2	0.5	0.5	0.7	0.7	0.5	1.00
7,000	100	2,300	< 100	2,900	3,800	9,700	12,300	9,000	9,000	11,000	3,000
87	43	73	–	74	83	87	87	88	86	89	80
284	188	215	–	300	300	323	318	325	316	329	260
173	–	63 ²⁾	–	93 ²⁾	87 ²⁾	178 ⁴⁾	165 ⁵⁾	179 ⁴⁾	186 ⁴⁾	182 ⁴⁾	113 ²⁾
37	253	91	242	59	65	25	11	24	18	22	71
80		178		183	183		43		188		
0.2	0.7	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
1.6	3.9	3.6	2.4	1.1	2	2.5	1.2	2.4	1.7	1.4	1.9
6 months	12 months	6 months	3 months	6 weeks	6 weeks	48 h	24 h	48 h	48 h	48 h	4 weeks
–	–	–	–	6 months	6 months	–	–	–	–	–	6 months
–	–	–	–	–	–	6 months at –18 °C	6 months at –40 °C	6 months at –18 °C	6 months at –18 °C	6 months at –18 °C	–
thixotropic casting very good adhesion to PPS, Cu, Al excellent chem. resistance (e. g. oil)	tested by the criteria of UL 94 HB	tested by the criteria of UL 94 HB	tested by the criteria of UL 94 HB	excellent chemical resistance	excellent chemical resistance	casting of bare semiconductors and sensors	casting of bare chips and sensors especially for large-area encapsulation	casting of bare semiconductors and sensors	casting of bare semiconductors and sensors	casting of bare semiconductors and sensors	thixotropic casting, coating, fixing in electrical engineering good chem. resistance

Our material selection guides are a technical selection aid giving an overview of various product variants. We will be pleased to provide you with sales details, such as available container sizes, stock availability and minimum order quantities, on request.

The data and information provided are based on tests performed under laboratory conditions. Reliable information about the behavior of the product under practical conditions and its suitability for a specific purpose cannot be concluded from this. It is the user's responsibility to test the suitability of the product for the intended purpose by considering all specific requirements. Type, physical and chemical properties of the materials to be processed with the product, as well as all actual influences occurring during transport, storage, processing and use, may cause deviations in the behavior of the product compared to its behavior under laboratory conditions. All data provided are typical average values or uniquely determined parameters measured under laboratory conditions. The data and information provided are therefore no guarantee for specific product properties or the suitability of the product for a specific purpose. Verbal ancillary agreements are deemed not to exist.

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MATERIAL SELECTION GUIDE

Encapsulants

