Curing of photoinitiated adhesives

Curing with UV light or visible light in the respective wavelength the chart below. All standard DELOLUX HID discharge lamps are range. DELOLUX LED curing lamps are especially suitable as per also suitable.

Lamp type	DELOLUX 80, DELOLUX 50 and 502, DELOLUX 20 and 202						
	365	400	460				
DELO DUALBOND AD465	+	++	-				
DELO DUALBOND GE4707	+	++	-				
DELO DUALBOND GE4906	+	++	-				
DELO DUALBOND GE4910	+	++	-				
DELO DUALBOND GE4919	+	++	-				
DELO DUALBOND GE4949	+	++	-				
DELO DUALBOND MF4992	+	++	-				
DELO DUALBOND AD4930	+	++	-				
DELO DUALBOND AD4950	+	++	-				

⁺⁺ particularly suitable + suitable - not suitable

Product selection

Application area	Potting/encapsulation Coating	Bonding of UVA- and VIS-permeable materials	Bonding of VIS-permeable materials	Bonding of opaque materials	Bonding, potting, encapsulation, coating with reliable curing in shadowed areas	
Products	DELO KATIOBOND, DELO PHOTOBOND	DELO KATIOBOND, DELO PHOTOBOND	Light-activated DELO KATIOBOND, light-curing DELO PHOTOBOND	Light-activated DELO KATIOBOND, light-activated humidity-curing DELO PHOTOBOND LA	DELO DUALBOND	
	Application	Application ↓		Application	Application	
	V			↓	V	
	Irradiation	Join	ing	Preactivation	Joining	
ing		\downarrow		V	V	
Processing suggestion		Irradi	ation	Joining	Irradiation and/or heat or air humidity	







DELO DUALBOND

Acrylates one-component · UV-/light-/heat-curing · UV-/light-/humidity-curing

DISPENSING

CONSULTING

DELO

DELO DUALBOND photoinitiated-curing acrylates

		UV-/light-/heat-curing		UV-/light-/humidity-curing						
Product code		AD465	GE4707	GE4906	GE4910	GE4919	GE4949	MF4992	AD4930	AD4950
Application area	B=bonding, S=sealing	B/S	S	S	B/S	В	В	В	В	В
Color of cured product	in 0.1 mm layer thickness	red fluorescent	blue fluorescent	yellowish-emitting	colorless clear	yellowish	anthracite gray	red fluorescent	yellowish	colorless
	in 1.0 mm layer thickness	-	blue fluorescent	-	-	yellowish slightly milky	black	-	-	-
Viscosity [mPas] at +23°C	rheometer; SR = shear rate	6,500 SR 10/s	1,500 SR 2/s	2,200 SR 10/s	2,300 SR 2/s	11,000 SR 2/s	-	100,000 SR 2/s	14,000 SR 2/s	25,400 SR 2/s
	Brookfield, DIN EN 12092	24,000	1,500	-	2,000	-	35,000	215,000	-	36,000
Wavelength range for curing [nm]		320 – 420	*			320	- 450 			
Recommended irradiation time [s] LED 400 nm, LED intensity 200 mW/cm ²		2	7	7	4	4	10	13	3	4
Curing time until final strength		5 min @ +110 °C 3 min @ +130 °C	50 min @ +120°C 25 min @ +130°C	-	-	-	-	-	-	-
Compression shear strength [MPa] DELO Standard 5	glass/glass	23 1)	-	-	7 1)	15 ³⁾	10 ³⁾	9 4)	9 1)	9 1)
DEEO Glandard O	glass/Al	22 ¹⁾	-	-	6 ¹⁾	20 ³⁾	7 4)	8 4)	4 1)	6 ¹⁾
	glass/stainless steel	19 ¹⁾	4 ²⁾	2 ²⁾	-	-	-	6 ⁴⁾	-	-
	glass/PA	14 ¹⁾	5 ²⁾	2 ²⁾	6 ¹⁾	10 ³⁾	10 ³⁾	8 4)	8 1)	8 1)
	glass/PBT	5 ¹⁾	-	1 ²⁾	2 1)	-	4 3)	4 4)	4 1)	4 1)
	glass/FR4	21 ¹⁾	-	-	9 1)	-	-	9 4)	9 1)	11 ¹⁾
	PC/PC	-	5 ²⁾	-	-	20 ³⁾	7 4)	8 4)	-	-
	PMMA/PMMA	-	-	-	-	-	-	-	7 1)	8 1)
Tensile strength [MPa]	by the criteria of DIN EN ISO 527	17	5	3	6	15	-	8	5	8
Elongation at tear [%]	by the criteria of DIN EN ISO 527	220	460	500	315	110	-	350	45	270
Young's modulus [MPa]		320 DIN EN ISO 527	-	< 100 DIN EN ISO 527	17 DIN EN ISO 527	-	118 DMTA	< 100 DIN EN ISO 527	30 DIN EN ISO 527	45 DIN EN ISO 527
Shore hardness	by the criteria of DIN EN ISO 868	D 50	A 36	A 24	A 62	D 40	A 85	A 58	A 80	A 77
Glass transition temperature T _g [°C]		+100 rheometer	-	+10 rheometer	+24 rheometer	+110 DMTA	-	+66 DMTA	+80 DMTA	+72 DMTA
Average coefficient of linear expansion [ppm/K] in the temperature range [°C]	TMA	-	-	225 +40 to +60	235 +30 to +140	-	-	-	210 +30 to +140	217 +30 to +140
Shrinkage [vol. %]	DELO Standard 13	5.6	6.5	5.6	5.4	7	4.6	4.3	3	4.6
Water absorption [weight %]	by the criteria of DIN EN ISO 62 24 h at +23°C	1.2	0.8	1.1	1.3	3	5.8	2.8	0.6	2.5
Special features of product		dry surface very fast curing very good plastic/ metal adhesion	good flow behavior well suitable for sealing applications high temperature resistance	well suitable for potting, encapsulation and sealing applications highly flexible high temperature resistance	well suitable for potting, encapsulation and sealing applications flexible high temperature resistance	multi-purpose adhesive dry surface	multi-purpose adhesive opaque good plastic adhesion	multi-purpose adhesive high temperature resistance good plastic/ metal adhesion flexible	multi-purpose adhesive good corrosion resistance good shadow strength 2 - 3 MPa	multi-purpose adhesive good plastic adhesion

Compression shear strength – irradiation and curing conditions:

Product description

DELO DUALBOND are one-component, solvent-free acrylatebased adhesives.

Usual temperature range

DELO DUALBOND acrylates are normally used in a temperature product. range of -40°C to +120°C (or +150°C, see special features of product "high temperature resistance").

Many product properties depend on the temperature and can It is the user's responsibility to test the suitability and strength of it has to be checked before each use whether a certain adhesive is considering all specific requirements. suitable for the temperatures in the required area of application. Please see the Technical Data Sheet for more information on how microelectronics, electrical engineering, optics and precision our products react to temperatures.

Processing

processed directly from the container or using dispensing units.

Primary curing of the UV-/light- and humidity-curing acrylates DELO DUALBOND can only be achieved if the complete adhesive Please also refer to the DELO PHOTOBOND and DELO KATIOBOND is reached by light of the suitable wavelength and sufficient intensity for the required period of time.

mechanism. This that no adhesive remains liquid in shadowed quickly until final strength by irradiation with UV light or visible light areas. Secondary curing proceeds through a reaction with air (VIS) humidity or the remaining humidity on the components to be DELO KATIOBOND are photoinitiated, one-component and humidity and +23°C.

strength build-up.

proceed if the total adhesive is reached by light of the suitable dry surface after curing. wavelength. Adhesive not reached by light can be completely cured by subsequent heat input. Irradiation times, curing temperatures and times are product-specific and can be found in the appropriate Technical Data Sheet.

Surface pretreatment

For optimal bond strength, the surfaces to be bonded must be free of dust, oil, grease, separating agents and other contaminations. After cleaning, adhesion can be further improved by surface sand blasting, flaming, plasma treatment or corona treatment.

Storage life

After delivery, most DELO DUALBOND products are preservable for 6 months if stored in the unopened original container at room

You can find detailed information in the Technical Data Sheet of the

change permanently, in particular at high temperatures. Therefore, the adhesive on original components for the intended purpose by

DELO DUALBOND products are predominantly used in electronics, engineering for bonding, coating, fixing and sealing.

The products are normally delivered ready for use. They are More type-specific properties are included in the Technical Data Sheets, Material Safety Data Sheets and Instructions for Use.

> For application tests and any question you might have regarding the use of DELO products, please do not hesitate to contact the DELO Engineering.

> Selection Charts.

DELO PHOTOBOND are also photoinitiated, one-component and Adhesive in shadowed areas crosslinks through a second curing solvent-free, acrylate-based adhesives. They can be cured very

bonded. The curing speed is approx. 2 mm/24 h at 50 % rel. solvent-free adhesives based on cationic-polymerizing epoxy resins. The adhesives cure until final strength after a minimum Primary curing by light is absolutely necessary for a professional irradiation time even after irradiation is stopped. As a result, the bonding as curing by humidity does not show any considerable light-activated types offer the possibility of preactivation. With this procedure two opaque components can be bonded. UV-curing UV-/light- and heat-curing DELO DUALBOND products can be DELO KATIOBOND can be used as Dam&Fill products for chip cured by both heat and light. Complete curing by light can only encapsulation. All DELO KATIOBOND products have a completely

¹⁾ UVA intensity 55 – 60 mW/cm², 60 s

²⁾ LED 400 nm, LED intensity 200 mW/cm², 60 s

³⁾ LED 400 nm, LED intensity 200 mW/cm², 30 s

⁴⁾ LED 400 nm, LED intensity 60 mW/cm², 60 s

AD = ADhesive GE = General Encapsulant MF = Multi Function