

Application examples

High-strength bonding at thermal stress

For example bonding of:
highly stressed carbide inserts, hardened guideway gibs in machines, robot gripper construction
→ DELO-DUOPOX AD840
→ DELO-DUOPOX AD895
→ DELO-PUR 9692

High-strength bonding with fast initial strength

For example plastic to metal, garnish moldings resp. front spoilers of cars
→ DELO-PUR 9692
→ DELO-PUR 9694

High initial strength in very short periods of time

→ DELO-DUOPOX 02 rapid
→ DELO-DUOPOX 03 rapid
→ DELO-DUOPOX 03 rapid thix
→ DELO-PUR 9692

High run resistance

→ DELO-DUOPOX AD897
→ DELO-PUR 9692
→ DELO-PUR 9694
→ DELO-PUR 9895

Good tension-equalizing behavior

→ DELO-PUR 9691
→ DELO-PUR 9694
→ DELO-PUR 9895
→ DELO-DUOPOX CR804
→ DELO-DUOPOX CR805
→ DELO-DUOPOX AD840
→ DELO-DUOPOX AD821
→ DELO-DUOPOX AD848

Impregnating / soaking / laminating

For example of porous materials such as cast, fabric and glass fibers, of windings
→ DELO-DUOPOX CR804
→ DELO-DUOPOX CR805

Sealing and casting of electrical components

→ DELO-DUOPOX CR804, DELO-DUOPOX CR805
especially for narrow gaps, tension-equalizing, flexible
→ DELO-DUOPOX AD821
tension-equalizing, flexible
→ DELO-DUOPOX AD894
tough-hard
→ DELO-PUR 9691
tension-equalizing, fast initial strength

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Our selection charts 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. Nothing contained herein shall be construed to indicate the non-existence of any relevant patents or to constitute a permission, encouragement or recommendation to practice any development covered by any patents, without permission of the owner of this patent. All products provided by DELO are subject to DELO's General Terms of Business. Verbal ancillary agreements are deemed not to exist.

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08/15

Adhesives

Dispensing

Curing

Consulting

DELO

DELO



SELECTION CHART

DELO-DUOPOX

DELO-PUR

Epoxy resins
two-component · cold-curing · high-strength to elastic

Polyurethanes
two-component · cold-curing · tough-elastic

Two-component adhesives		Epoxy resins DELO-DUOPOX										Polyurethanes DELO-PUR				
Product group																
fast curing	✓	✓	✓									✓	✓	✓		
elastic/tension-equalizing				✓	✓	✓	✓	✓				✓	✓	✓	✓	
very high strengths							✓	✓	✓	✓	✓			✓		
high temperature of use				✓	✓		✓	✓	✓	✓	✓					
for large gaps			✓					✓		✓	✓				✓	
good flow behavior	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Product code	02 rapid AUTOMIX ²⁾	03 rapid AUTOMIX ²⁾	03 rapid thix AUTOMIX ²⁾	CR804	CR805	AD821 AUTOMIX ²⁾	AD840 AUTOMIX ²⁾	AD848	AD894 AUTOMIX ²⁾	AD895 AUTOMIX ²⁾	AD897 AUTOMIX ²⁾	9691 AUTOMIX ²⁾	9692 AUTOMIX ²⁾	9694 AUTOMIX ²⁾	9895 AUTOMIX ²⁾	
Color cured product	yellowish transparent	yellowish transparent	yellowish transparent	yellowish transparent	black	yellowish transparent	dark gray	dark gray	black	gray	gray	black	black	black	light beige	
Filler	unfilled	unfilled	unfilled	unfilled	unfilled	unfilled	minerals	minerals	minerals	minerals	minerals	minerals	minerals	minerals	minerals	
Mixing ratio	A:B by weight	1:1	1:1	1:1	0.84:1	0.84:1	0.58:1	0.88:1	0.87:1	7:3	7:3	7:3	1:1	1:1	1:1	1:1
	A:B by volume	1:1	1:1	1:1	0.72:1	0,72:1	1:2	1:1	1:1	2:1	2:1	2:1	1:1	1:1	1:1	1:1
Density	component A [g/cm ³]	1.17	1.15	1.19	1.17	1.17	1.18	1.18	1.19	1.37	1.37	1.37	1.45	1.47	1.47	1.48
at room temperature (approx. +23 °C), DELO Standard 13	component B [g/cm ³]	1.14	1.14	1.16	1.0	1.0	1.03	1.33	1.37	1.18	1.19	1.17	(mixture)	1.43	1.43	1.44
Viscosity	component A [mPas]	8,000	13,000	50,000	10,000	10,000	21,000	100,000	310,000	45,000	100,000	pasty	pasty	pasty	pasty	pasty
at room temperature (approx. +23 °C), Brookfield	component B [mPas]	18,000	18,000	36,000	400	450	12,000	150,000	530,000	20,000	95,000	pasty	pasty	pasty	pasty	pasty
Processing	processing time ¹⁾ [min] at room temperature	6 (3 g preparation)	3 (3 g preparation)	3 (3 g preparation)	35	35	20	90	–	45	30	30	4	5	7	30
100 g preparation	max. reaction temperature [°C]	130 (20 g preparation)	140 (20 g preparation)	130 (20 g preparation)	110	106	69	86	90	98	98	95	40	60	50	35
Curing conditions	initial strength 1 – 2 MPa (at rt/at +80 °C)	12 min/–	11 min/–	13 min/–	7.5h/18min	–	5.5 h/12 min	7 h/13 min	7 h/10 min	5 h/–	5.5 h/–	6 h/–	90 min/–	30 min	2 h	7 h/25 min
at room temperature	functional strength (at rt/at +80 °C)	24 h/15 min	2 h/5 min	2 h/5 min	24 h/60min	–	24 h/30 min	16 h/20 min	16 h/15 min	7 h/16 min	8 h/18 min	8 h/17 min	6 h/20 min	2 h/5 min	8 h/30 min	72 h/60 min
	final strength (at rt/at +80 °C)	72 h/1 h	24 h/40 min	24 h/1 h	7 d/45min	7 d	7 d/70 min	72 h/40 min	72 h/–	24 h/30 min	24 h/30 min	24 h/25 min	72 h/22 min	72 h/10 min	–/32 min	72 h/90 min
Tensile shear strength [MPa]	DIN EN 1465 1.6 mm 7 d rt	18 (24 h rt)	13 (24 h rt)	13 (24 h rt)	12	12	14	23	21	19	19	17	12 (24 h rt)	16 (24 h rt)	16 (72 h rt)	13
AI/Al sand-blasted	DELO Standard 39 6 mm 7 d rt	16 (72 h rt)	16 (72 h rt)	17 (72 h rt)	–	–	13	27	23	31	32	32	13 (72 h rt)	23 (72 h rt)	–	12 (72 h rt)
Floating roller peel resistance [N/mm]	DELO Standard 38	2.5	1.1	0.3	4.1	4	4.4	6	7	0.7	1.2	1.3	6	6	8	10
St/St sand-blasted																
Temperature stability [MPa]	by the criteria of DIN EN 1465	1	1	2	–	–	2	5	5	3.5	2.5	2.8	2.5	8	3	3
at +100 °C																
Tensile strength [MPa]	DIN EN ISO 527	24	31	33	11	10	10	30	30	41	40	42	13	20	10	10
Elongation at tear [%]	DIN EN ISO 527	20	19	20	60	60	60	6	4	2.1	2	1.8	20	3	25	30
Young's modulus [MPa]	DIN EN ISO 527	1,000	2,000	2,000	100	100	114	1,700	1,800	2,300	2,400	2,500	500	1,500	100	300
Shore hardness D	by the criteria of DIN EN ISO 868	74	75	75	43	45	50	76	75	73	73	77	69	75	50	50
Glass transition temperature [°C]	DELO Standard 24, rheometer, 2 nd heating step	31	38	–	32 (DSC)	–	–	69	70	63	63	64	49	53	40	39
Coefficient of expansion [ppm/K]	DELO Standard 26	211 +30 to +140	242 +30 to +140	224 +30 to +140	253 +30 to +140	–	149 +30 to +140	160 +30 to +150	165 +23 to +160	91 +30 to +50	88 +30 to +50	88 +30 to +50	162 +25 to +140	153 +30 to +140	167 +30 to +140	205 +30 to +140
in the temperature range [°C]																
Shrinkage [vol. %]	DELO Standard 13	3.7	4.3	4.3	3.9	3.6	2	2.6	2	3.6	3.6	3.8	3.4	1.5	4.8	3.4
Water absorption [weight %]	DIN EN ISO 62	0.7	1	1.1	0.68	0.5	0.63	0.18	0.21	0.3	0.25	0.25	0.24	0.3	0.3	0.3
24 h at room temperature																
Application examples	casting of small hollows	bonding of small components	bonding and sealing of housings	casting resin	casting resin	casting of small components	bonding and coating	bonding of large and small components	casting and bonding of components	bonding and coating	coating and trowelling	casting of sensors and small components	bonding of housings	bonding of housings	bonding and sealing of plastic	
						bonding of large components	test for cytotoxicity acc. to ISO 10993-5			test for cytotoxicity acc. to ISO 10993-5		test for cytotoxicity acc. to ISO 10993-5			test for cytotoxicity acc. to ISO 10993-5	
Basic properties and advantages of all products	highly reliable connections, mainly with dissimilar material combinations, for example glass, plastic, metal, ceramic or wood; multi-purpose, solvent-free, low curing shrinkage, very good temperature and chemical resistance, curing without elevated temperatures (however, curing can be accelerated by heat)															

¹⁾ Processing time: mixture must be used, i. e. mixed, applied and joined, within this time

²⁾ DELO-AUTOMIX = product is also available in double chamber cartridges for simple handling of two-component adhesives (all above-mentioned products in 50 ml; DELO-DUOPOX 02 rapid, 03 rapid, AD840, AD848, AD894, AD895, AD897, PUR 9694, 9895 also available in 200 ml)

AD = Adhesive CR = Casting Resin

Product description

DELO-DUOPOX are two-component epoxy resins and DELO-PUR are two-component polyurethanes curing at room temperature (rt) after mixing the two components in the ratio indicated.

The DELO-AUTOMIX products can be processed from double chamber cartridges with a static mixing tube similar to one-component products. DELO supplies suitable mixing tubes we also use in internal development and testing.

The mixing tube B050 is only conditionally suitable for our DELO-DUOPOX rapid adhesives.

Standard temperature range

The products (except for DELO-DUOPOX 02 rapid, 03 rapid, 03 rapid thix) are normally used in a temperature range of –40 °C to +140 °C (DELO-DUOPOX) resp. –40 °C to +125 °C (DELO-PUR).

Many product properties depend on the temperature and can permanently change especially at high temperatures. The suitability of the respective adhesive for the intended temperature range of use must be tested according to the application before use. You can find details on the behavior of the products under the influence of elevated temperatures in the respective technical data sheet.

Processing

DELO-DUOPOX and DELO-PUR products must be mixed at the ratio indicated until the mixture is homogeneous and streak-free.

Deviations in the mixing ratio of +/- 5 % generally do not have any evident influence on the properties of the cured product.

Curing

DELO-DUOPOX and DELO-PUR cure at room temperature. Increased temperatures accelerate curing.

After exceeding the processing time, the viscosity increases until the adhesive is completely cured

Surface pretreatment

The surfaces to be bonded must be free of oil, grease, separating agents and other contaminations. We recommend our DELOTHEN cleaners.

After cleaning, adhesion can be further improved by surface pretreatment.

Storage life

After delivery in unopened containers:

see technical data sheet of the respective product.

Use

DELO-DUOPOX and DELO-PUR products are used for high-strength bonding of components which are extremely stressed to some extent. These products are constructional elements. The adhesive selection is supposed to be optimized regarding component material, stresses, construction and processing technology. Application areas are mainly found in automotive and automotive supplier industry, mechanical and electrical engineering, electronics, plant construction, construction technology, energy and environmental technology.

Further information

You can find more details on type-specific properties in the technical data sheets and material safety data sheets.

Our Engineering Department will be pleased to support you in technical application tests and questions resulting from using DELO products.

DELO dispensing guns for 50 ml double chamber cartridges

- DELO-XPRESS 902 manual operation; for 1:1 and 2:1 cartridges
- DELO-XPRESS 903 pneumatic operation; for 1:1 cartridges
- DELO-XPRESS 907 pneumatic operation; for 1:1 and 2:1 cartridges

DELO dispensing gun for 200 ml double chamber cartridges

- DELO-XPRESS 905 pneumatic operation; for 1:1 and 2:1 cartridges



Simple mixing and dispensing by means of DELO-XPRESS 902



DELO-XPRESS 903

DELO-XPRESS 907

DELO-XPRESS 905

Mixing tubes and accessories

- Mixing tube B 050 short for 50 ml double chamber cartridges with clip-on nozzle for especially precise dispensing
- Mixing tube B 050 universal for 50 ml double chamber cartridges luer-cone, attaching of dispensing tips is possible
- Mixing tube F 200 short for 200 ml double chamber cartridges
- Mixing tube F 200 long for 200 ml double chamber cartridges dispensing tips can be attached to this mixing tube
- Euro cartridge adapter for the dispensing with Euro cartridge dispensing guns