



## Epoxy Adhesives

- fast • safe
- economical



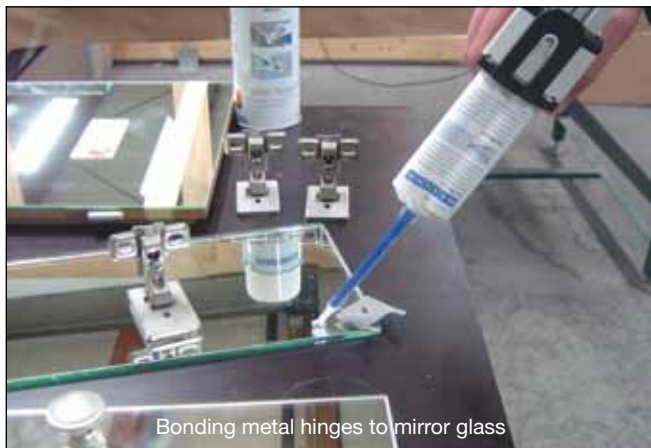
## Epoxy Adhesives

WEICON Epoxy Adhesives are cold-curing, solvent-free two-component systems with extremely strong bonding properties. They enable material bonds with high tensile and impact strength and are thus ideal for assembly, repairs and production.

In particular in cases of innovative constructions and bonds between different materials such as e.g.

- metals
- hard plastics
- fibre-reinforced materials (GRP, CFRP, fibreglass etc.)
- ceramics
- glass, stone
- wood etc.

today's requirements are ever more demanding (e.g., optically attractive joints coupled with very high strength). Frequently these materials are combined with one another, which leads to additional requirements.



Bonding metal hinges to mirror glass

Here the use of WEICON Epoxy Adhesives offer a number of advantages:

- When use is made of WEICON Epoxy Adhesives, the surfaces of the materials are not altered as they are when e.g., soldering or welding is employed.
- No stresses are caused in the materials, and there is no need to use additional fixing methods.
- Through the use of thinner and lighter materials, simpler and more cost-effective constructions are often possible. This can sometimes result in considerable reductions in both weight and costs.

Application of all WEICON Epoxy Adhesives is by means of practical double syringes. By this method, both resin and hardener are delivered in a user-friendly manner in the 1:1 volume proportions. Time-consuming weighing-up of the two components is no longer necessary.

Through the use of WEICON Epoxy Adhesives, there are to be found varied applications in all sectors, from simple repair and overhaul work to series applications in almost all branches of industry.



Injection-moulding cable entries in connector sets

For specific applications, there are different adhesives available. They vary with regard to their handling, speed at which they cure, viscosity, colour, range of temperatures and the strength which can be achieved.

WEICON Epoxy Adhesives cure out with virtually no shrinkage and, once properly cured, are resistant to many chemicals (for detailed information, see p. 4).

Technical product information, a type selection table and information on use and storage of the products can be found on the following pages.

## The range of types

### WEICON Easy-Mix

#### Mixing and Dosing System

Thanks to the modern mixing and dosing system, all four types can be cleanly and accurately automatically dosed, mixed and applied in only one working operation.

In this way, a uniform quality and process assurance is guaranteed in a production series.

Product advantages:

- ready for use
- dosing, mixing and application in just one working operation
- tedious mixing by hand is no longer necessary, so that no mixing and dosing mistakes are possible
- speedy in application
- faster cycle times in series production possible
- economical in use, as minimal material wastage

### WEICON Easy-Mix S 50

For quick repair and maintenance jobs. Ideal too for series production with short cycle times.

- viscid, self-levelling
- very short pot life (4-5 minutes)
- fast-curing
- colour pale yellow, clear

# Technical data

Product		WEICON Epoxy Adhesives in liquid condition					
		Easy-Mix S 50	Easy-Mix N 50	Easy-Mix N 5000	Easy-Mix Metal	Epoxy Minute Adhesive	Fast-Metal Minute Adhesive
Basis:		epoxy resin, unfilled	epoxy resin, unfilled	epoxy resin, unfilled	epoxy-resin steel-filled	epoxy resin, unfilled	epoxy resin, steel-filled
Nature:		viscid	viscid	fluid	viscid	viscid	paste consistency, crack-filler
Supplied in:		double cartridge	double cartridge	double cartridge	double cartridge	double syringe	double syringe
Contents:		50 ml	50 ml	50 ml	50 ml	24 ml	24 ml
Mixing proportion by volume resin / hardener (automatically):		1 : 1	1 : 1	1 : 1	1 : 1	1 : 1	1 : 1
Pot life with 10 ml material and at +20°C (in minutes):		4 - 5	45	20	4 - 5	3 - 4	3 - 4
Density of the mixture (g/cm <sup>3</sup> ):		1,15	1,07	1,07	1,80	1,14	1,80
Viscosity of the mixture at + 20°C:		8.500 mPa·s	7.500 mPa·s	5.000 mPa·s	120.000 mPa·s	32.000 mPa·s	300.000 mPa·s
Temperature	Processing *1:	+10°C to +30°C	+10°C to +40°C	+10°C to +35°C	+10°C to +30°C	+10°C to +30°C	+10°C to +30°C
	Curing:	+6°C to +40°C	+10°C to +40°C	+6°C to +40°C	+6°C to 40°C	+6°C to +40°C	+6°C to +40°C
Colour:		slightly yellow, clear	yellow, opaque	almost colourless, glass clear	black	almost colourless, glass clear	dark grey
Gap covering power to maximum *2:		2 mm	2 mm	2 mm	2 mm	2 mm	4 mm
Cure time at + 20°C	Handling strength (35% strength) after:	30 minutes	120 minutes	60 minutes	40 minutes	35 minutes	40 minutes
	Capable of bearing mechanical loads (50% strength) after:	1 hour	24 hours	3 hours	2 hours	1 hour	2 hours
	Final strength (100%) after:	1 day	3 days	2 days	1 day	1 day	1 day
		WEICON Epoxy Adhesives in fully-cured condition					
Average strength of the pure epoxy resin in accordance with DIN 53281-83	Pressure (Mpa):	9	2	10	10	9	10
	Tensile (Mpa):	40	35	40	24	40	24
	Torsional (Mpa):	58	50	50	58	58	58
	Impact resistance (kJ/m <sup>2</sup> ):	50	25	50	50	50	50
	E-module (Mpa):	2.000 - 2.500	2.000 - 2.500	1.700 - 2.000	4.000 - 4.500	2.000 - 2.500	4.000 - 4.500
	Shore hardness D:	65	55	65	70	65	70
Average tensile shear strength as per DIN 53283 on	Sandblasted steel (N/mm <sup>2</sup> ):	20	17	21	20	19	20
	Sandblasted aluminium (N/mm <sup>2</sup> ):	19	16	19	19	18	19
	Rigid PVC, roughened (N/mm <sup>2</sup> ):	13	11	14	11	12	11
Temperature resistance		-50°C to +80°C	-50°C to +80°C	-50°C to +80°C	-50°C to +145°C*3	-50°C to +80°C	-50°C to +145°C*3
Linear shrinkage*4:		20 mm/m about 2,0 %	20 mm/m about 2,0 %	20 mm/m about 2,0 %	3 mm/m about 0,3 %	20 mm/m about 2,0 %	3 mm/m about 0,3 %
Thermal conductivity (ASTM D 257):		0,30 W/m·K	0,20 W/m·K	0,25 W/m·K	1,11 W/m·K	0,20 W/m·K	1,11 W/m·K
Electrical resistance (ASTM D 257):		10 <sup>13</sup> Ω/cm	10 <sup>13</sup> Ω/cm	10 <sup>13</sup> Ω/cm	10 <sup>11</sup> Ω/cm	10 <sup>13</sup> Ω/cm	10 <sup>11</sup> Ω/cm
Dielectric strength (ASTM D 149):		1,0 kV/mm	1,0 kV/mm	1,0 kV/mm	1,2 kV/mm	1,0 kV/mm	1,2 kV/mm
Thermal expansion coefficient (ISO 11359):		50 x 10 <sup>-6</sup> k <sup>-1</sup>	50 x 10 <sup>-6</sup> k <sup>-1</sup>	50 x 10 <sup>-6</sup> k <sup>-1</sup>	30 x 10 <sup>-5</sup> k <sup>-1</sup>	50 x 10 <sup>-6</sup> k <sup>-1</sup>	30 x 10 <sup>-6</sup> k <sup>-1</sup>

\*1 For easier workability when ambient temperatures are low, the double cartridges and syringes should be warmed up to room temperature (20°C) before application.

\*2 These details are dependent on the type and structure of the materials to be bonded, and are only to be taken into account for bonding work. In the case of casting, e.g. of electronic components, the thickness of a layer should not be allowed to exceed 10 mm.

\*3 After 20 hours at room temperature (+20°C), post-temper at +100°C for about 14 hours.

\*4 Measured on a casting 900 x 75 x 10 mm after 7 days stored at +20°C.

### Instructions for use

To ensure a perfect bond, the surfaces to be joined must be clean and dry (e.g., clean and degrease using Cleaner S or Plastic Cleaner). Smooth surfaces should be roughened, e.g. by sandblasting.

Apply adhesive to only one of the surfaces to be bonded. WEICON Epoxy Adhesives will bridge a gap of minimum 0.2 mm and maximum of 2 mm (for Fast Metal Minute Adhesive minimum 0.5 mm and maximum 4 mm). The pot life given is for a material quantity of 10 ml at room temperature. If larger quantities are used, the curing time will be faster due to the typical reaction heat of epoxy resins (exothermic reaction). Similarly, higher ambient temperatures shorten the cure time (as a rule of thumb, every +10°C increase above room temperature will halve working and curing time). Temperatures below +16°C will extend working and curing times considerably, while below about +5°C, no reaction will take place at all.

### Physiological properties / health and safety at work

WEICON Epoxy Adhesives, when properly handled and completely cured, are toxicologically essentially harmless. When using these adhesives, the physical, safety technical, toxicological and ecological data and regulations in our EC safety data sheets ([www.weicon.de](http://www.weicon.de)) must be observed.

### Storage

When kept at a constant room temperature of about +20°C and unopened in dry conditions, WEICON Epoxy Adhesives will keep for at least 18 months. Avoid direct sunlight. If these

storage instructions are disregarded, the storage life will be reduced to six months.

Epoxy resins are fundamentally liable to crystallise at temperatures of less than +5°C. This effect is accentuated by wide variations in temperature such as can frequently occur during transport in winter. This also has a negative effect on working qualities, curing and technical details, although these effects can be reversed by warming up to a maximum of +50°C (no naked flame).

In the case of WEICON Epoxy Adhesives, careful selection and combination of the base resins (bisphenol A and F) ensures a reduction of crystallisation.



Bonding filter housings of Plexiglas (PMMA)

## Chemical resistance of WEICON Epoxy Adhesives after curing \*

Acetic acid dilute < 5%	+	Hydrocarbons, aliphatic (crude oil derivatives)	+
Acetone	0	Hydrocarbons, aromatic (benzene, toluene, xylene)	-
Alkalis (basic materials)	+	Hydrochloric acid < 10%	+
Amyl acetate	+	Hydrochloric acid 10 - 20%	+
Amyl alcohols	+	Hydrofluoric acid dilute	0
Anhydrous ammonia 25%	+	Hydrogen peroxide < 30% (hydrogen superoxide)	+
Barium hydroxide	+	Impregnating oils	+
Butyl acetate	+	Magnesium hydroxide	+
Butyl alcohol	+	Maleic acid (cis-butenedioic acid)	+
Calcium hydroxide (slaked lime)	+	Methanol (methyl alcohol) < 85%	0
Carbolic acid (phenol)	-	Milk of lime	+
Carbon disulphide	+	Naphthalene	-
Carbon tetrachloride (tetrachloromethane)	+	Naphthene	-
Caustic potash solution	+	Nitric acid < 5%	0
Chlorinated water	+	Oils, minerals	+
Chloroacetic acid	-	Oils, vegetable and animal	+
Chloroform (trichloromethane)	0	Oxalic acid < 25% (ethanedioic acid)	+
Chlorosulphonic acid	-	Paraffin	+
Chromic acid	+	Perchloroethylene	0
Chroming baths	+	Petrol (92 - 100 octane)	+
Creosote oil	-	Phosphoric acid < 5%	+
Cresylic acid	-	Phthalic acid, phthalic acid anhydride	+
Crude oil	+	Potassium carbonate (potash solution)	+
Crude oil and crude oil products	+	Potassium hydroxide (caustic potash) 0-20%	+
Diesel fuel oil	+	Soda lye	+
Ethanol < 85% (ethyl alcohol)	0	Sodium bicarbonate (sodium hydrogen carbonate)	+
Ethyl alcohol	0	Sodium carbonate (soda)	+
Ethyl benzole	-	Sodium chloride (cooking salt)	+
Ethyl ether	+	Sodium hydroxide < 20% (caustic soda)	0
Exhaust gases	+	Sulphur dioxide	+
Formic acid >10%	-	Sulphuric acid < 5%	0
Glycerine (trihydroxypropane)	+	Tannic acid dilute < 7%	+
Glycol	0	Tetralin (tetrahydronaphthalene)	0
Grease, oils and waxes	+	Toluene	-
Heating oil, diesel	+	Trichloroethylene	0
Humic acid	+	Turpentine substitute (white spirit)	+
Hydrobromic acid < 10%	+	Xylene	-

+ = resistant    0 = resistant for a limited time    - = not resistant

\* Storage of all WEICON Epoxy Adhesives was at +20°C chemical temperature

## WEICON Easy-Mix N 50

Ideal for manufacturing processes with assembly and positioning carried out at different times.

- viscid, self-levelling
- normal pot life (45 minutes)
- longer curing time
- colour yellow, opaque

## WEICON Easy-Mix N 5000

Particularly suitable for connections where appearances are important.

- liquid, self-levelling
- shorter pot life (20 minutes)
- normal curing time
- almost colourless, glass clear

## WEICON Easy-Mix Metal

Ideal for repairs requiring large tolerance gaps to be bridged.

- steel-filled
- viscid, self-levelling
- very short pot life (5 minutes)
- machinable after curing
- fast-curing
- colour black

## WEICON Easy-Mix Hand Dispenser D50

Robust, fracture-resistant construction of fibreglass-reinforced plastic (polyamide) with a metal trigger.

## WEICON Mixing Nozzle

“Quattro” static mixer with 20 mixer elements (over a length of about 8 cm) for optimum mixing with minimal loss of materials.



Stopping drill-holes -  
(vacuum-table of a CNC milling planer)

WEICON Epoxy Minute Adhesive and WEICON Fast-Metal Minute Adhesive are especially suitable for occasionally necessary repair and maintenance works. They are applied by using the practical double syringe. This means that resin and hardener are delivered automatically in the right proportions. After this, the mixing is done manually.

## WEICON Epoxy Minute Adhesive

This transparent adhesive retains elasticity after curing and is ideal for jobs in construction and assembly and in fact in all cases where the use of WEICON Easy-Mix Systems would not be efficient.

- viscid, self-levelling
- very short pot life (3 - 4 minutes)
- fast-curing
- almost colourless, glass clear.

## WEICON Fast Metal Minute Adhesive

Due to its high viscosity (paste consistency), this steel-filled adhesive can not only be applied to vertical surfaces, it can also be used to fill cracks, bubbles and uneven surfaces. Ideal for repairs requiring large tolerance gaps to be bridged.

- paste consistency, gap-filling
- very short pot life (3 - 4 minutes)
- quick-curing
- machinable (grinding, filing, drilling etc.)
- colour dark grey

## Type selection table

	Easy Mix S 50	Easy Mix N 50	Easy Mix N 5000	Easy-Mix Metal	Epoxy Minute Adhesive	Fast Metal Minute Adhesive
Metals (e.g. aluminium, cast iron, brass, stainless steel)	++	+	++	++	+	++
Hard plastics* (e.g. rigid PVC)	++	++	++	+	+	+
Fibre-reinforced materials (e.g. GRP, CFRP, fibreglass)	++	+	++	++	+	+
Wood (hardwood and softwood)	+	+	++	+	+	+
Balsa wood	++	++	+	+	++	+
Timber products (e.g. plywood)	+	+	+	+	+	+
Glass ceramics	+	+	+	+	+	+
Stone (e.g. marble, granite, brick, concrete)	++	++	++	++	++	+
Rubber / elastomers	-	-	-	-	-	-

(++) Highly suitable (+) Suitable (-) Not suitable

\* Except for plastics such as polyethylene, polypropylene, polyacetal, polytetrafluoroethylene and other fluorinated hydrocarbons with naturally adhesive-rejecting surfaces. Within the framework of the above type recommendations, bonding of dissimilar material pairs such as metals and plastics is also possible.



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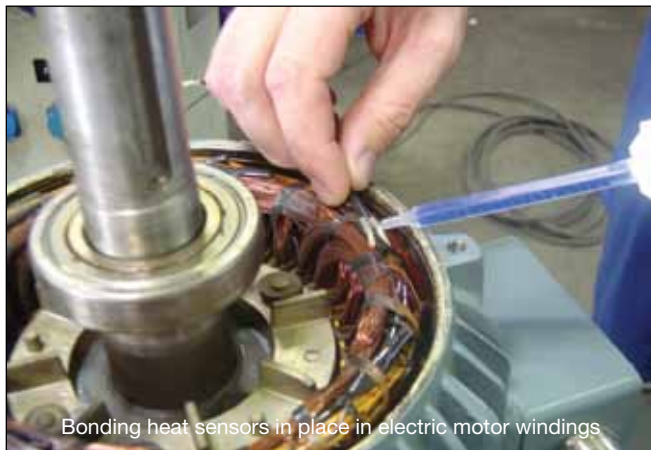
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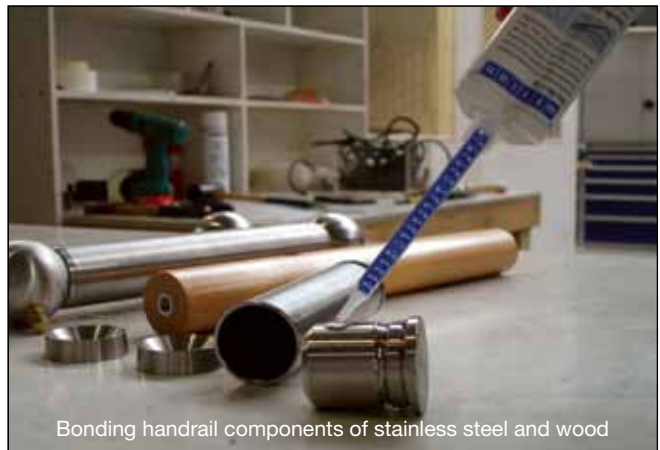
Bonding various external connections for camper vehicles



Casting end-cap



Bonding heat sensors in place in electric motor windings



Bonding handrail components of stainless steel and wood

Any product specifications and recommendations, when herein must not be seen as guaranteed product characteristics. They are based on our laboratory tests and on practical experiences. Since individual application conditions are beyond our knowledge, control and responsibility, this information is provided without any obligation. We do warrant the continually high quality of our products being free from defects in accordance with and subject to our General Sales Conditions. However, own adequate laboratory and practical tests to find out if the product in question meets the requested properties are recommended. A claim cannot be derived from them. The user bears the only responsibility for non-appropriate or other than specified applications.

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