Epoxy Resin Systems
Plastic Metal

WEICON Ceramic BL

Wear protection | increased efficiency | drinking water approval according to BS 6920

WEICON Ceramic BL is filled with silicon carbide and zirconium silicate, offers high chemical and temperature resistance as well as extreme wear protection and high abrasion resistance. The epoxy resin system is especially suited for the lining of heavily stressed pump housings, as wear protection for slide bearings, slides, funnels and pipes and for the repair of castings, valves and blower fans.

A coating with WEICON Ceramic BL, which gives surfaces a very smooth finish, increases the flow speed of liquids and thus increases the efficiency of pumps, pipes, valves, etc. by 5 % to 20 %.

The product can be used in mechanical and plant engineering, in apparatus engineering and in many other areas of industry. Wear-resistant final coating for all Plastic Metal types. WEICON Ceramic BL is suitable in combination with one of the other WEICON Plastic Metal types for a system build-up as a surface finish for visual inspection.

Characteristics

Base		epoxy
Filler		silicon carbide, zirconium silicate
Texture		flowable
Colour		blue
Minimum shelf life	at room temperature	36 mon.

Processing

Processing temperature		+15 °C to +40 °C
Component temperature		>3 °C above dew point
Relative air humidity		< 85 %
Mixing ratio by weight		100:8
Mixing ratio by volume		100:15
Viscosity of the mixture	at +25 °C	23.000 mPa·s
Density of the mixture		1,9 g/cm³
Consumption	Layer thickness 1.0 mm	1.9 kg/m²
Max. layer thickness	per step	10 mm

Curing

Pot life	at 20 °C, 500 g batch	55 min.
Additional layer after	(35 % strength)	5 h
Working strength after	(80 % strength)	8 h
Final strength	(100 % strength)	12 h
Shrinkage		0,13 %

Mechanical properties after curing

- Measured after curing at		24 h RT + 4 h +60 °C
Tensile strength	DIN EN ISO 527-2	59 MPa
Elongation at break (tensile)	DIN EN ISO 527-2	0.9 %
E-modulus (tensile)	DIN EN ISO 527-2	7100-7300 MPa
Compressive strength	DIN EN ISO 604	116 MPa
Bending strength	DIN EN ISO 178	98 MPa
Hardness (Shore D)	DIN ISO 7619	90±3
Adhesive strength	DIN EN ISO 4624	17 MPa
Taber Test	DIN ISO 9352 (H18, 1 kg, 1000 rotations)	0,3 g / 0,17 cm³
Lap shear strength material thickn. 1,5mm DIN EN 1465		
Steel 1.0338 sandblasted		12 MPa
Stainless steel V2A sandblasted		11 MPa
Aluminium sandblasted		7 MPa
Galvanized steel		4 MPa

Thermal parameters

Temperature resistance		-35 °C to +180 °C
Tg after curing at room temperature	(DSC)	~ +58 °C
Tg after tempering (at 110°C)		108
Heat deflection resistance	DIN EN ISO 75-2	+81 °C
Thermal conductivity	DIN EN ISO 22007-4	0,55 W/m·K
Heat capacity	DIN EN ISO 22007-4	0,83 J/(g·K)

Electrical parameters

Resistance	DIN EN 62631-3-1	1,95·10^14 Ω·m
Magnetic		no

Approvals / Guidelines

ISEGA	LFGB §§ 30&31EG 1935/2004
DNV	DNV rules for classification
ISSA Code	75.509.19/20
IMPA Code	812937/38
Food safety certification	ISEGA | LFGB | EG 1935/2004 | BS 6920

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Instructions for use

When using WEICON products, the physical, safety-related, toxicological and ecological data and regulations in our EC safety data sheets (www.weicon.com) must be observed.

Surface Pre-Treatment

The successful application of WEICON Ceramic BL depends on the thorough preparation of the surfaces. This is the most important factor for ensuring overall success. Dust, dirt, oil, grease, rust and moisture or wetness have a negative impact on adhesive strength. Therefore, before processing WEICON Ceramic BL, the following points must be observed: the surfaces must be free of any oil, grease, dirt, rust, oxides, paint and other impurities or residues. For cleaning and degreasing, we recommend WEICON Cleaner Spray S. Smooth and exceptionally soiled surfaces should additionally be treated by mechanical surface pre-treatment, e.g. by grinding or preferably by abrasive blasting. In case of blasting, the surface should be brought to a degree of purity of SA 2 ½ - “Near White Blast Cleaning” (according to ISO 8501/1-2, NACE, SSPC, SIS). In order to achieve an optimum surface roughness of 75 – 100 µm, angular, single-pass abrasive media (aluminium oxide, corundum) should be used. Multi-use abrasive media (slag, glass, quartz) but also ice blasting will have a negative effect on the surface quality. The air for blasting must be dry and oil-free. Metal parts that have come into contact with sea water or other salt solutions should first be rinsed thoroughly with demineralised water and, if possible, left to rest overnight so that all salts can be dissolved from the metal. Before each application of WEICON Ceramic BL, a test for soluble salts should be carried out according to the Bresle method (DIN EN ISO 8502-6). The maximum amount of soluble salts remaining on the substrate should not exceed 40 mg/m². Heating and repeated blasting of the surface may be necessary to remove all soluble salts and moisture. After each mechanical pre-treatment, the surface should be cleaned again with WEICON Cleaner Spray S and protected from further contamination until the coating is applied. Areas where no adhesion to the substrate is desired must be treated with silicone-free mould release agents. For smooth surfaces, we recommend WEICON Mould Release Agent Liquid F 1000 or, for porous surfaces, WEICON Mould Release Agent Wax P 500. After the surface pre-treatment, WEICON Ceramic BL should be applied as soon as possible (within one hour) to avoid oxidation, flash rust or new contamination.

Mixing

First, stir the resin. Then mix the resin and hardener together thoroughly and bubble-free for at least four minutes at 20°C (68°F). The included processing spatula or a mechanical mixer, such as the Stirrer Stainless Steel, can be used for this purpose. With mechanical mixers, a low speed of max. 500 rpm should be used. The components should be stirred until a homogeneous mixture is achieved. The mixing ratio of the two components must be strictly observed, as otherwise strongly deviating physical values will result (max. deviation + /- 2 %). Only prepare a batch as large as can be processed within the pot life of 55 minutes. The indicated pot life time refers to a material batch of 500g and 20°C (68° F) material temperature. Mixing larger quantities or higher processing temperatures will result in faster curing due to the typical reaction heat of epoxy resins.

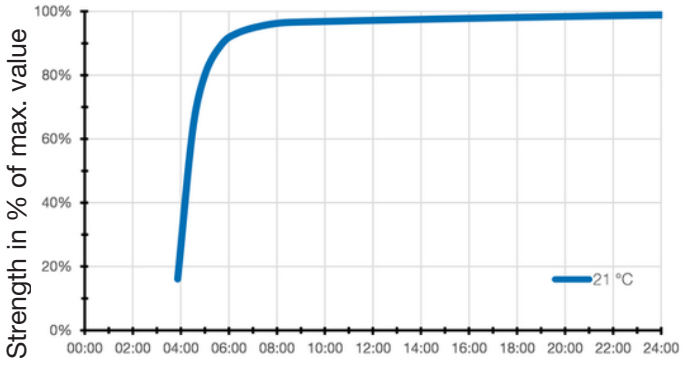
Application

For processing, we recommend an ambient temperature of 20°C (68 °F) at less than 85% relative humidity. The highest adhesive strength is achieved when the parts to be processed are heated to >35°C (>95°F) before application. For a thin pre-coat, work WEICON Ceramic BL thoroughly into the surface in crosswise layers using a paint brush to achieve maximum adhesion. By means of this technique, the epoxy resin penetrates well into all cracks and roughness depths. Afterwards, a second application with a paint brush or foam roller can be carried out straight away, until the desired layer thickness is reached. A layer of approx. 0.25 to 0.50 mm can be achieved per work step. Make sure that the epoxy resin is applied evenly and without air bubbles. Further coats can be applied in each case after approx. 5 hours (layer sequence time).

Curing

Final hardness is reached after 12 hours at 20°C (68°F) at the latest. At lower temperatures, the curing can be accelerated by evenly applying heat up to max. 40°C (104°F), e.g. with a heating pack, hot air blower or fan heater. Higher temperatures shorten the curing time. The following rule of thumb applies: each increase by +10°C (50°F) above room temperature (20°C/68°F) will decrease the curing time by half. Temperatures below 16°C (61°F) increase the curing time, until at approx. 5°C (41°F) and below, almost no reaction will take place.

Increase in strength



Time in hours

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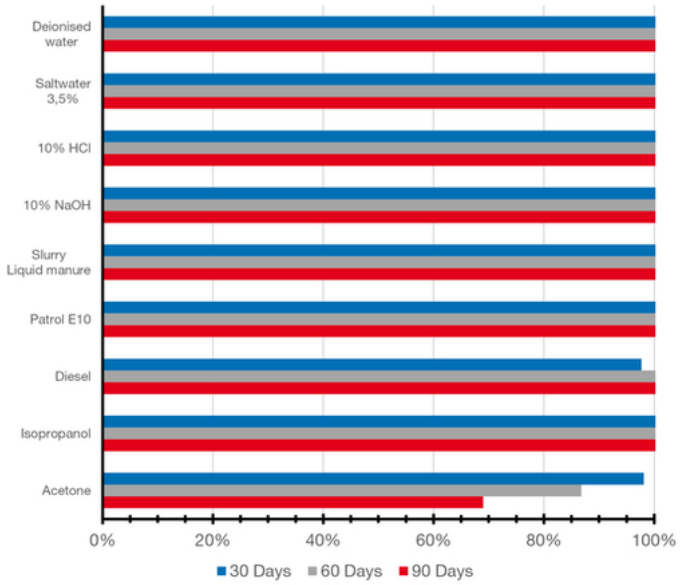
Storage

WEICON Epoxy Resin Systems should be stored in a dry place at room temperature. Unopened containers can be stored at temperatures from +18 °C to +28 °C. Opened containers must be used up within 6 months.

Tensile strength after storage



Scope of delivery

Processing Spatula | Instructions for use | Gloves | Resin & Hardener

Accessories

10000147	Cleaner Spray S, 500 ml, transparent
10000347	Cleaner S, 5 L, colourless, transparent
10024313	Surface Cleaner, 400 ml, transparent
10025288	Surface Cleaner, 5 L, transparent
10026647	Mould Release Agent Liquid F 1000, 250 ml, white, milky
10026712	Mould Release Agent Wax P 500, 150 g
10053995	Repair Stick Multi-Purpose, 115 g, vintage white
10000913	Glass Fibre Cloth Tape, 1 PCE, white
10010887	Processing Spatula short, 1 PCE
10022562	Processing Spatula long, 1 PCE
10059417	Brush 35 short, flat, Plastic Metal, 1 PCE
10001978	Stirrer Stainless Steel, 1 PCE
10016002	Pump Dispenser WPS 1500, 1 PCE
10002034	Empty cartridge, 1 PCE
10039667	Cable Scissors No. 35, 1 PCE
10045523	Processing Kit, 1 PCE

Recommended equipment

Angle grinder	PE film 0.2 mm
Blast machine	Fabric tape
Heat pocket	Brush
Hot or fan heater	Foam roller
Smoothing trowel, spatula	Lint-free cloth

Conversion table

(°C x 1.8) + 32 = °F	Nm x 8.851 = lb·in
mm/25.4 = inch	Nm x 0.738 = lb·ft
µm/25.4 = mil	Nm x 141.62 = oz·in
N x 0.225 = lb	mPa·s = cP
N/mm^2 x 145 = psi	N/cm x 0.571 = lb/in
MPa x 145 = psi	kV/mm x 25.4 = V/mil

Available sizes

10000093	WEICON Ceramic BL, 0,5 kg, blue
10005233	WEICON Ceramic BL, 2 kg, blue
10054394	WEICON Ceramic BL, 0,2 kg, blue

	WEICON A	WEICON B	WEICON BR	WEICON C	WEICON F	WEICON F2	WEICON HB 300	WEICON HT 111	WEICON SF	WEICON ST	WEICON TI	WEICON UW	WEICON WR2	WEICON HP	WEICON Fire Safe	WEICON Anti-Static	WEICON Food Grade	WEICON Anti-Stick	WEICON Ceramic BL	WEICON GL	WEICON GL-S	WEICON Ceramic W	WEICON Ceramic HC 220	WEICON WP	WEICON WR	WEICON CBC
Repair and moulding	x	x	x	x	x	x	x	x	x	x	x	x	x													
Adhesive				x	x		x	x		x				x	x											
Wear, erosion and corrosion protection – abrasion-resistant coating																x	x	x	x	x	x	x	x	x		
Casting, relining and gap compensation – casting and injecting potting compound	x					x							x												x	x

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Chemical resistance after curing* (Excerpt)

1,4-Dioxane	-	Glycol	+
Exhaust fumes	+	Uric acid	-
Adipic acid	-	Impregnating oils	+
aliphatic hydrocarbons	+	Iodides (K, Na etc.)	-
Formic acid >10 % (methanoic acid)	-	Potassium carbonate	+
Ammonia anhydrous 25%	-	Potassium hydroxide 0-20 % (caustic potash)	+
Aniline	-	Milk of lime	+
aromatic hydrocarbons	+	Cresol	-
Barium hydroxide	+	Magnesium hydroxide	+
Benzoic acid	-	Maleic acid (cis-ethylenedicarboxylic acid)	-
Benzyl alcohol	-	Methanol (methyl alcohol) <85 %	o
Benzyl chloride	-	Methylene chloride	-
Boric acid	-	Mineral oil	+
Bromides	-	Naphthalene	+
Butadiene (1,3-)	-	Sodium bicarbonate (sodium hydrogen carbonate)	+
Butyric acid	-	Sodium carbonate (soda)	+
Butyl acetate	o	Sodium chloride (table salt)	+
Butyl alcohol	o	Nitrates	-
Calcium hydroxide (slaked lime)	+	Nitrobenzene	-
Chloroanilines	-	Oils, vegetable and animal	+
Chloroform (trichlormethane)	-	Oxalic acid <25 % (ethanedioic acid)	o
Chlorosulphuric acid (wet and dry)	-	Perchloraethylene	-
Chlorosilanes	-	Kerosene	+
Chlorinated water (swimming pool concentration)	-	Phenol	-
Chromates (K, Na, etc.)	-	Phosphoric acid <50%	+
Chromic acid	-	Phthalic acid, phthalic anhydride	-
Cyanides (K, Na etc.)	-	Nitric acid <5%	-
Cyclohexanone	-	Sulphur dioxide (wet and dry)	-
Diethyl ether	+	Carbon disulphide	-
Mineral oil and mineral oil products	+	Sulphuric acid <5%	+
Acetic acid diluted <5%	o	Soap solution	+
Ethanol <85 % (ethyl alcohol)	o	Turpentine	+
Greases, oils and waxes	+	Carbon tetrachloride (tetrachloromethane)	-
Hydrofluoric acid	-	Tetralin (tetrahydronaphthalene)	-
Tannic acid diluted <7%	o	Trichloraethylene	-
Glycerin (trihydroxipropane)	+	Hydrogen peroxide <30 % (hydrogen superoxide)	o

+ = resistant 0 = for a limited time - = not resistant *The storage of all WEICON Plastic Metal types was carried out at +20°C chemical temperature.

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