

WEICON WR



Liquid | steel-filled | wear resistant

WEICON WR is suitable for areas where metal parts are exposed to strong wear due to friction. For example, the epoxy resin system can be used for repairs and recasting of shafts, for pouring out bearings as well as cutting and punching tools, for the production of casting and profile milling models as well as drawing moulds, for the underpouring of machines and foundations and as wear-resistant base layer before the final coating with WEICON Ceramic BL. It can be used in mechanical engineering, toolmaking, model and mould making as well as many other areas.

Characteristics

Base	Epoxy
Filler	steel
Texture	liquid
Colour	black
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	100:15
Mixing ratio by volume	100:43
Viscosity of the mixture	at +25 °C 4000-5000 mPa·s
Density of the mixture	2,4 g/cm ³
Consumption	Layer thickness 1.0 mm 2.4 kg/m ²
Max. layer thickness	per step 10 mm

Curing

Pot life	at 20 °C, 500 g batch	40 min.
Additional layer after	(35 % strength)	5 h
Working strength after	(80 % strength)	7 h
Final strength	(100 % strength)	16 h
Shrinkage		0,06 %

Mechanical properties after curing

- Measured after curing at		24 h RT + 4 h +60 °C
Tensile strength	DIN EN ISO 527-2	46 MPa
Elongation at break (tensile)	DIN EN ISO 527-2	1,0 %
E-modulus (tensile)	DIN EN ISO 527-2	4900-5300 MPa
Compressive strength	DIN EN ISO 604	100 MPa
E-modulus (pressure)	DIN EN ISO 604	5800-6300 MPa
Bending strength	DIN EN ISO 178	72 MPa
Hardness (Shore D)	DIN ISO 7619	83±3
Adhesive strength	DIN EN ISO 4624	12 MPa
Taber Test	DIN ISO 9352 (H18, 1 kg, 1000 rotations)	1,3 g / 0,5 cm ³

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 N/mm ²
Galvanized steel	2 MPa

Thermal parameters

Temperature resistance		-35°C (-4°F) to +120°C (+248°F)
Tg after curing at room temperature	(DSC)	~ +48 °C
Tg after tempering (at 60°C)	(DSC)	+60 °C
Heat deflection resistance	DIN EN ISO 75-2	+48 °C
Thermal expansion coefficient	ISO 11359	45·10 ⁻⁶ 1/m·K
Thermal conductivity	DIN EN ISO 22007-4	0,5 W/m·K
Heat capacity	DIN EN ISO 22007-4	0,64 J/(g·K)

Electrical parameters

Resistance	DIN EN 62631-3-1	1,53·10 ¹³ Ω·m
Magnetic		yes

Approvals / Guidelines

ISSA Code	75.509.15/16
IMPA Code	812947/48

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 WR depends on the thorough preparation of the surfaces. This is the most important factor for overall success. Dust, dirt, oil, grease, rust and moisture or wetness have a negative impact on the adhesion. Therefore, before processing WEICON WR, the following points must be observed: The areas to be bonded or repaired 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 particularly heavily soiled surfaces should additionally be treated by mechanical surface pre-treatment, e.g. by grinding or preferably by 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, disposable blasting media

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WEICON WR

(aluminum oxide, corundum) should be used. The surface quality is negatively influenced by the use of reusable blasting media (slag, glass, quartz), but also by ice blasting. 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 WR, 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 WR should be applied as soon as possible (within one hour) to avoid oxidation, flash rust or new contamination.

Mixing

Before adding the hardener, the resin needs to be mixed with the fillers thoroughly and without creating bubbles. 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 40 minutes. The specified pot life refers to a material batch of 500 g 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.

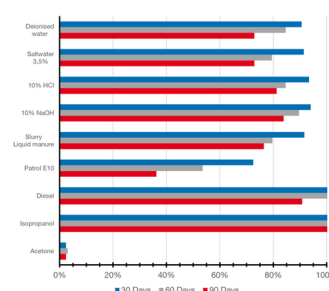
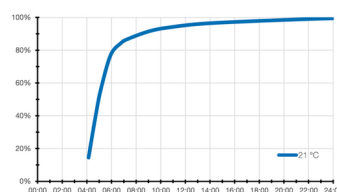
Application

For processing, we recommend an ambient temperature of 20°C (68 °F) at less than 85% relative humidity. For a thin pre-coat, work WEICON WR intensively into the surface in crosswise layers using the Contour Spatula Flexy or a paint brush to achieve maximum adhesion. By means of this technique, the epoxy resin penetrates well into all cracks and roughness depths. Afterwards, further applications can be

carried out straight away, until the desired layer thickness is reached. Make sure that the epoxy resin is applied evenly and without air bubbles.

Curing

Final hardness is reached after 24 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 at all.



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.

Scope of delivery

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

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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
- 10057667 Injection Packer Set, 1 PCE
- 10057730 Injection Packer/ rectangular, 1 PCE
- 10057731 Injection Packer/ flat, 1 PCE
- 10000441 Cartridge Gun, 1 PCE
- 10002034 Empty cartridge, 1 PCE
- 10039667 Cable Scissors No. 35, 1 PCE
- 10045523 Processing Kit, 1 PCE

Recommended equipment

- Angle grinder
- Blast machine
- Heat pocket
- Hot or fan heater
- Smoothing trowel, spatula
- PE film 0.2 mm
- Fabric tape
- Brush
- 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/mm² x 145 = psi
- N/cm x 0.571 = lb/in
- MPa x 145 = psi
- kV/mm x 25.4 = V/mil

Available sizes

- 10000077 WEICON WR, 0,5 kg, black
- 10000078 WEICON WR, 2 kg, black
- 10054400 WEICON WR, 200 g, black

	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

To the product detail page:



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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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