

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 1/2 - "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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(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.

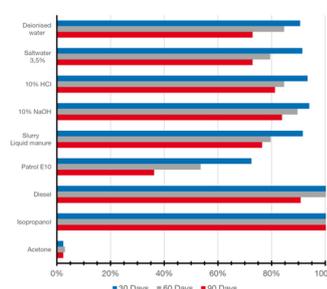
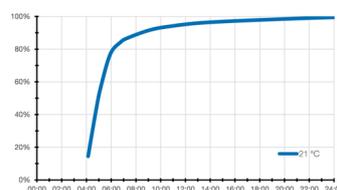
Application

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
- mm/25.4 = inch
- µm/25.4 = mil
- N x 0.225 = lb
- N/mm² x 145 = psi
- MPa x 145 = psi
- Nm x 8.851 = lb·in
- Nm x 0.738 = lb·ft
- Nm x 141.62 = oz·in
- mPa·s = cP
- N/cm x 0.571 = lb/in
- 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 TT | 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)

| | | | |
|---|---|--|---|
| Exhaust fumes | + | Potassium carbonate | + |
| Acetone | o | Potassium hydroxide 0-20 % (caustic potash) | + |
| Ethyl ether | + | Milk of lime | + |
| Ethyl alcohol | o | Carbolic acid | - |
| Ethylbenzene | - | Creosote oil | - |
| Alkalis (alkaline substances) | + | Cresylic acid | - |
| Hydrocarbons, aliphatic (petroleum derivatives) | + | Magnesium hydroxide | + |
| Formic acid >10 % (methanoic acid) | - | Maleic acid (cis-ethylenedicarboxylic acid) | + |
| Ammonia anhydrous 25% | + | Methanol (methyl alcohol) <85 % | - |
| Amyl acetate | + | Mineral oil | + |
| Amyl alcohol | + | Naphthalene | - |
| Hydrocarbons, aromatic (benzene, toluene, xylene) | + | Naphthene | - |
| Barium hydroxide | + | Sodium carbonate (soda) | + |
| Petrol (92-100 octane) | + | Sodium bicarbonate (sodium hydrogen carbonate) | + |
| Hydrobromic acid <10 % | + | Sodium chloride (table salt) | + |
| Butyl acetate | + | Sodium hydroxide >20 % (caustic soda) | o |
| Butyl alcohol | + | Caustic soda | + |
| Calcium hydroxide (slaked lime) | + | Heating oil, diesel | + |
| Chloroacetic acid | - | Oxalic acid <25 % (ethanedioic acid) | + |
| Chloroform (trichlormethane) | o | Perchloraethylene | o |
| Chlorosulphuric acid (wet and dry) | - | Kerosene | + |
| Chlorinated water (swimming pool concentration) | + | Oils, vegetable and animal | + |
| Hydrochloric acid | + | Phosphoric acid <5% | + |
| Chromium bath | + | Phthalic acid, phthalic anhydride | + |
| Chromic acid | + | Crude oil | + |
| Diesel fuels | + | Nitric acid <5% | o |
| Mineral oil and mineral oil products | + | Hydrochloric acid <10 % | + |
| Acetic acid diluted <5% | + | Sulphur dioxide (wet and dry) | + |
| Ethanol <85 % (ethyl alcohol) | + | Carbon disulphide | + |
| Greases, oils and waxes | + | Sulphuric acid <5% | o |
| Hydrofluoric acid diluted | o | White spirit | + |
| Tannic acid diluted <7% | + | Carbon tetrachloride (tetrachloromethane) | + |
| Glycerin (trihydroxipropane) | + | Tetralin (tetrahydronaphthalene) | o |
| Glycol | o | Toluene | - |
| Humic acid | + | Trichloroethylene | o |
| Impregnating oils | + | Hydrogen peroxide <30 % (hydrogen superoxide) | + |
| Potash | + | Xylene | - |

+ = 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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