Epoxy Resin Systems
Plastic Metal

WEICON HT 111

steel-filled | pasty | high-temperature-resistant

The epoxy resin system WEICON HT 111 is used to repair and touch up metal parts. It is pasty, steel-filled and high-temperature-resistant up to 200 °C (392 °F); for a short period of time, it can withstand temperatures up to 280 °C (536 °F). WEICON HT 111 is chemical-resistant, non corrosive and is processesd with a mixing ratio of 1:1.

The repair material is suitable for processing on vertical surfaces and can be used for metal repairs and bonding on castings and metal parts, for filling blowholes, for repairing damage to containers, car bodies and machine parts, and for sealing pumps and pipes.

Due to its properties, the composite material is particularly suitable for applications in mechanical and plant engineering, apparatus engineering and many other areas of industry.

Characteristics		
Base		Epoxy
Filler		steel
Texture		pasty
Colour		dark grey
Processing		
Processing temperature		+15°C to +40°C
Component temperature		>3 °C above dew point
relative air humidity		< 85 %
Mixing ratio by weight		100:100
Mixing ratio by volume		100:90
Viscosity of the mixture	at +25 °C	1.900.000 mPa·s
Density of the mixture		2,5 g/cm³
Consumption	Layer thickness 1.0 mm	2.5 kg/m²
max. layer thickness	per step	20 mm

Curing		
Pot life	at 20 °C, 500 g batch	30 min.
Additional layer after	(35 % strength)	6 h
Working strength after	(80 % strength)	9 h
Final strength	(100 % strength)	24 h
Shrinkage		0,15 %
Mechanical properties after curing		
- measured after curing at		24 h RT + 14 h 120 °C
Tensile strength	DIN EN ISO 527-2	50 MPa
Elongation at break (tensile)	DIN EN ISO 527-2	0,7 %
E-modulus (tensile)	DIN EN ISO 527-2	6800 - 7400 MPa
Compressive strength	DIN EN ISO 604	100 MPa
Bending strength	DIN EN ISO 178	42 MPa
Hardness (Shore D)	DIN ISO 7619	87±3
Adhesive strength	DIN EN ISO 4624	20 MPa
Taber Test	DIN ISO 9352 (H18, 1 kg, 1000 rotations)	1,1 g / 0,4 cm³
Lap shear strength material thickn. 1,5mm DIN EN 1465		
Steel 1.0338 sandblasted		14 MPa
Stainless steel V2A sandblasted		15 MPa
Aluminium sandblasted		9 MPa
Galvanized steel		4 MPa
Thermal parameters		
Temperature resistance		-35 °C to +200 °C, briefly up to +280 °C
Tg after curing at room temperature	(DSC)	~ +57 °C
Tg_nach_Tempern_100_C_		+92
Heat deflection resistance	DIN EN ISO 75-2 (*after tempering)	+100* °C
Thermal conductivity	DIN EN ISO 22007-4	0,5 W/m·K
Heat capacity	DIN EN ISO 22007-4	0,63 J/(g·K)
Electrical parameters		
Resistance	DIN EN 62631-3-1	1,5·10¹³ Ω·m
magnetic		yes
Approvals / Guidelines		
MIL-Spec	comply with	MIL-C-24176

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 HT 111 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 HT 111, 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

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- ""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 (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 HT 111, 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/m^2. 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 HT 111 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 a mortar stirrer, 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 30 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°C) 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 HT 111 intensively into the surface in crosswise layers using the Contour Spatula Flexy 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. To fill large gaps or holes, fibreglass, expanded metal or other mechanical fixing materials should be used. Finally, the surface can be smoothed easily with the help of a PE film and a rubber roller.

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.

Shelf life

Store WEICON HT 111 at room temperature in a dry place. Unopened containers can be stored at temperatures of +18°C to +28°C for at least 36 months after delivery date. Opened containers must be used up within 6 months.

Scope of delivery

Processing Spatula | Contour Spatula Flexy | Instructions for Use | Gloves

Accessories

10851010	Processing Kit, 1 PCE
11202500	Cleaner Spray S, 500 ml, transparent
15200005	Cleaner S, 5 L, colourless, transparent
11207400	Surface Cleaner, 400 ml, transparent
15207005	Surface Cleaner, 5 L, transparent
10604025	Mould Release Agent Liquid F 1000, 250 ml, white, milky
10604515	Mould Release Agent Wax P 500, 150 g
10539115	Repair Stick Multi-Purpose, 115 g, vintage white
10850005	Glass Fibre Cloth Tape, 1 PCE, white
10953001	Processing spatula, 1 PCE
10953003	Processing spatula, 1 PCE
52000035	Cable Scissors No. 35, 1 PCE
15841500	Pump Dispenser WPS 1500, 1 PCE

Recommended equipment

Angle grinder
blast machine
heating pack, hot air blower or fan heater
smoothing trowel, spatula
PE foil 0.2 mm

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fabric tape
paint brush, foam roller
rubber roller
lint-free cloths

Available sizes

10260002	WEICON HT 111, 200 g, dark grey
10260005	WEICON HT 111, 0,5 kg, dark grey
10260010	WEICON HT 111, 1 kg, dark grey

Conversion table

(°C x 1,8) + 32 = °F
mm/25,4 = inch
µm/25,4 = mil
N x 0,225 = lb
N/mm^2 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

	WEICON A	WEICON HT 111	WEICON B	WEICON BR	WEICON C	WEICON F	WEICON F2	WEICON HB 300	WEICON SF	WEICON ST	WEICON TI	WEICON UW	WEICON WR2	WEICON HP	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								
Wear protection															x	x	x	x	x	x		
Potting and gap filling	x						x						x								x	x

To the product detail page:

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Chemical resistance of WEICON Plastic Metals 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	+	Hydrogen peroxide <30 % (hydrogen superoxide)	+
Impregnating oils	+	Trichloraethylene	o
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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