Technical Data Sheet

VP 10-500

PolymerMetal for repair and maintenance of metals
in the high temperature range

MultiMetall
the MetalExistenceCompany®

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Technical Data Sheet

VP 10-500

Product description

VP 10-500 is a PolymerMetal on an organic basis for repair and maintenance of metals in the high temperature range.

VP 10-500 can be applied to cold or warm metal surfaces. The material does not cure at room temperature, but the partial curing starts at metal temperatures from 75 °C.

VP 10-500 has a clearly higher temperature resistance than cold-hardening polymer materials. A high chemical resistance especially against sulphuric acid is given.

VP 10-500 is a two-component product and it is available in pasty or brushable application consistency.

Technical data

Application consistency:	pasty or brushable
Colour after curing:	light grey
Compressive strength (DIN ISO 604):	160 MPa (23200 psi)
Tensile strength:	70 MPa (10150 psi)
Flexural strength (DIN 53452):	120 MPa (17400 psi)
Tensile shear on steel:	30 MPa (4350 psi)
Impact strength:	15-20 kJ/m²
Brinell hardness (DIN 50351):	32
Operation temperature	
- at metal temperature up to	max. 300 °C
- in liquids up to	max. 300 °C
- at water cooled surfaces (pressure 20 bar and water temperature 95 °C) up to	max. 550 °C
Corrosion:	none
Electrochemical corrosion (DIN 50900):	none
Fluidity:	brushable type: dimensionally stable on vertical surfaces; even in overhead situations at application thickness of 0,3 - 1 mm pasty type: dimensionally stable on vertical surfaces; even in overhead situations at application thickness of > 1 mm
Machinability:	with SiC-grinding plates or Diamond tools by dry cut
Cutting speed:	v_c = 60 - 125 m/min
Cutting depth:	a_p = 0,5 - 1 mm
Feed:	f = 0,1 - 0,2 mm/r
Density (mixed components):	2,50 g/cm³

Chemical resistance

After curing VP 10-500 shows an excellent resistance against acids and solvents depending on the concentration, temperature and duration of the exposure. Further details can be given on request.

Resistance against acids:

Acid	Duration	Weight increase
Sulphuric acid 20%	2 weeks	0.14 %
Sulphuric acid 50%	2 weeks	0.16 %
Hydrochloric acid 30%	16 days	0.47 %
Hydrochloric acid conc.	16 days	5.80 %

The above mentioned data were determined at an acid temperature of 70-90 °C.

Resistance against solvents:

Solvent	Duration	Weight increase
Methanol	90 days	0.00 %
Isopropyl alcohol	90 days	0.00 %
Acetone	90 days	0.00 %
Ethyl acetate	90 days	0.00 %
Toluene	90 days	0.00 %

The above mentioned data were determined at a solvent temperature of 22 °C.

Surface preparation

- Mechanically rough up the surface by blasting (it is recommended for blasting to use angular grit material; surface finish approx. 75 µm; purity level approx. Sa 2½ according to Swedish standard SIS 055900 / ISO 8501-1), cutting, grinding…
- Clean by sweeping, blowing off or exhausting
- Thoroughly degrease with MM-Degreaser Z or at least with a good grease dissolver (ethyl acetate, acetone,…); don't use alcohol, benzine or paint thinner

Processing data

Mixing ratio by:	Weight	Volume
VP 10-500	1	1
Hardener VP 10-500	1	1
Tool	Measuring spoon VP 10-500	Measuring spoon VP 10-500

Pot life (at room temperature): approx. 8 hours

Metal temperature	Partly cured at layer thickness approx. 1-2 mm	approx. 8 mm
150 °C	10 min	15 min
130 °C	30 min	60 min
115 °C	45 min	75 min
100 °C	90 min	110 min
85 °C	160 min	210 min
75 °C	250 min	300 min

After partial curing time VP 10-500 has already very solid properties and a machining and full temperature load is possible. A heating of at least 150 °C over a minimum of 5 hours is necessary to achieve final strength and chemical resistance.

Application instruction

The geometry of the work piece, the type of the repair and also the surface thickness (heat deduction) determines, whether VP 10-500 can be used. Even on warm metals VP 10-500 is dimensionally stable, both on vertical surfaces and in overhead situations. At holes and cracks VP 10-500 must be reinforced with fabric mates.

Before mixing the components the work piece should be prepared in accordance with the surface preparation. Always use clean tools for the removal of the components to avoid a reaction within the tins.

The available measuring spoons VP 10-500 can be used to measure the required volume parts of the components. Spoons must be filled levelled.

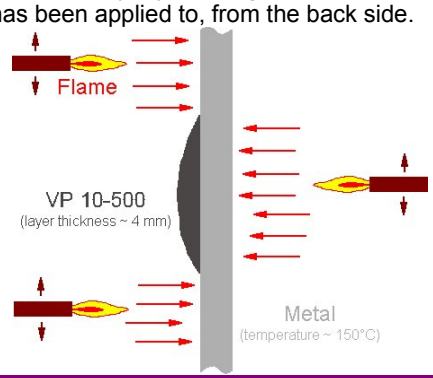
Under consideration of the mixing ratio the components must be mixed very thoroughly.

Depending on the application consistency the mixture (the PolymerMetal) can be applied with a spatula or a brush.

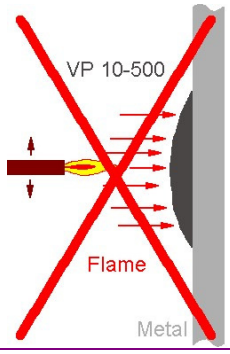
When using a spatula, a brush et cetera, first thoroughly apply a thin layer of the PolymerMetal with pressure onto the work piece to avoid air bubbles in the interface between metal and PolymerMetal ensuring a good surface contact. Immediately afterwards apply the required layer thickness on the still soft PolymerMetal.

VP 10-500 does not cure at room temperature. For partial curing the metal surface must be heated to a minimum of 75 °C to allow for mechanical machining and full thermal capacity. A heating of at least 150 °C (i.e. by using a welding torch or a Bunsen burner) over a minimum of 5 hours is necessary to achieve final strength and chemical resistance.

Right! Here the heating source is not pointed directly towards the applied VP 10-500, but towards the metallic basis material. Depending on the type (accessibility, wall thickness, ...) of the work piece the VP 10-500 could be heated up indirectly by heating up the area where VP 10-500 has been applied to, from the back side.



Wrong! The direct contact of the flame with VP 10-500 must be avoided.



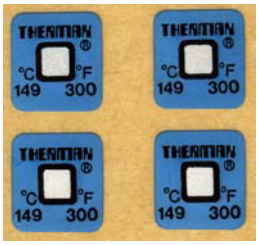
Irrespective whether the VP 10-500 has been applied to cold or warm metal, the metal temperature must not exceed approx. 130-150 °C up to the start of the curing process. If there is no suitable temperature measuring device available, we recommend the use of the self adhesive temperature indicators, which can be ordered at MultiMetall.

Before starting the repair of water-cooled systems, the water should be removed, so the minimum temperature for the curing can be reached.

All used tools should be cleaned straight after use.

Multiple coating
If a secondary or multiple coating is required, a surface preparation of the previous coating must be done, preferably by careful light blasting, before applying the next coating.

Notes regarding the use of the temperature indicators
The temperature indicators available at MultiMetall can be used to alternative measuring device.

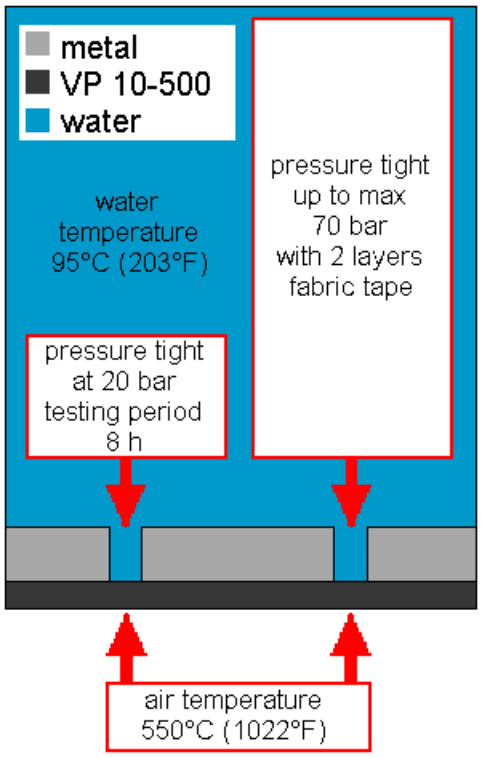


These are self adhesive one-way measuring temperature indicators, self temperature measuring points, which do change their colour from white to black after reaching the temperature printed on them (149 °C). Before applying VP 10-500, the temperature indicators must be removed i.e. using a spatula to achieve a good bonding of VP 10-500 on the surface.

For the use of an indicator it must be peeled from the release paper and applied with light pressure on a clean and grease free surface near the area where VP 10-500 is intended to be applied. In order to prevent misreading please ensure that the indicator is firmly adhered to the surface. Temperature indicators should be stored in a cool and dry place.

Reinforcement
If Fabric tapes or mats made of glass fibre or stainless steel are used optionally, the fabric should be completely coated on both sides and embedded in the PolymerMetal. Several layers increase strength. The heating up of VP 10-500 up to appr. 40-50 °C makes it easier to coat the fabric. Helpful is the use of the Application roller. Several layers increase strength.

Pressure test method



Working security
Avoid contact with skin and eyes! In case of skin contact, use water and soap for cleaning! Should VP 10-500 get into your eyes, rinse out thoroughly with water!

Storage

Product	Temperature commendation	Shelf life
VP 10-500	~ 22 °C	min. 5 years
Hardener VP 10-500	~ 22 °C	min. 5 years

VP 10-500 and Hardener VP 10-500 can possibly crystallize during longer cool storage. By warming up to approx. 60 °C the crystallization can be removed again. This has no effect on the high product quality. Even after repeated openings of the containers the high quality performance is preserved. Close tin carefully after usage.

Order information

No.	Product	Unit
701	VP 10-500, pasty	650 g
711	Hardener VP 10-500, pasty	650 g
702	VP 10-500, brushable	650 g
712	Hardener VP 10-500, brushable	650 g

Economicalness	Used quantity		Area	Volume
VP 10-500	650 g	1300 g	0,520 m^2	520 cm^3
Hard. VP 10-500	650 g			
VP 10-500	500 g	1000 g	0,400 m^2	400 cm^3
Hard. VP 10-500	500 g			
VP 10-500	1250 g	2500 g	1 m^2	1000 cm^3
Hard. VP 10-500	1250 g			

The areas were achieved at a layer thickness of 1 mm.

No.	Accessories	Unit
10	MM-Degreaser Z, liquid	1000 ml
11	MM-Degreaser Z, liquid	250 ml
33	Mixing plate (synthetic material)	20 x 12 cm
16	Mixing stick (stainless steel)	pc
15	Mixing cup (synthetic material)	pc
29	Measuring spoon VP 10-500	set
18	Fabric tape (stainless steel)	100 x 10 cm
20	Fabric tape (glass fibre)	1000 x 5 cm
22	Fabric mat (glass fibre)	30 x 40 cm
23	Application roller	pc
34	Temperature indicator (one-way)	15 pc

VP 10-500 is also available in:

No.	Product	Unit
806	MM-Set VP 10-500	pc

Availability
Technical data sheets are generally available in German or English language. VP 10-500 is only produced in Germany and delivered worldwide within short time by MultiMetall. In addition to that our products are internationally available from many MultiMetall-partners. Ask for further products from MultiMetall.

Note
The product information and instructions provided in this leaflet were prepared to the best of our knowledge and serve information purposes only. We recommend that appropriate tests are carried out prior to application in order to ensure that the products and methods fulfil the purpose desired by the user. In this procedure, the given data may serve as a basis. Application and processing of the products lie outside our possible control and are therefore the sole responsibility of the user.

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