

Technical Data Sheet

MM-metal UW

PolymerMetal for repairs under water or on wet metal surfaces

(Data Sheet Version 11.0 dd. 01.04.2009)



MultiMetal
the MetalExistenceCompany™

PolymerMetal® • MultiMetal® • Ceramium® • Molymetal® • Sealium® • XETEX®



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Technical Data Sheet

MM-metal UW

Product description

MM-metal UW is a PolymerMetal with extreme short curing time. It is certified for repairs under water or on wet metal surfaces. Possible application areas of MM-metal UW are the repair of under water components or the sealing of leaks - also in case of systems under pressure. It can be processed at ambient temperatures as low as 0 °C.

MM-metal UW is a two-component-product and can be used with three different Hardeners (Hardener UW3, Hardener UW9 or Hardener UW30), which offer different curing times. Three hardener components facilitate an efficient and practise-orientated use. Hardener UW3 is preferred to seal leakages; Hardener UW9 or Hardener UW30 are used at badly accessible repair sites or at excessively high ambient temperatures.

MM-metal UW is certified by „Lloyds Register of Shipping“. MM-metal UW has been tested for a longer period at a pressure of 80 bar; result pressure tight.

Technical data

Application consistency:	pasty
Colour after curing:	grey
Compressive strength (DIN ISO 604):	180 MPa (26100 psi)
Tensile strength:	75 MPa (10875 psi)
Bending strength (DIN 53452):	64 MPa (9280 psi)
Tensile shearing strength on steel:	27 MPa (3915 psi)
Brinell hardness (DIN 50351):	30
Specific passage resistance:	$5,8 \times 10^{14} \Omega\text{cm}$
Passage resistance:	$6,78 \times 10^{12} \Omega$
Linear expansion coefficient at 25-45 °C:	approx. $5,0 \times 10^{-6} \text{ K}$
Pressure-tight up to:	150 bar (2175 psi)
Temperature resistance:	-150 °C to +220 °C
Corrosion:	none
Electrochemical corrosion (DIN 50900):	none
Machinability:	with SiC-grinding plates or Diamond tools by dry cut
Density (mixed components):	2,75 g/cm ³

Chemical resistance

Already after curing a very good resistance is existent; highest resistance is effected after curing for approx. 6 days at approx. 21°C (alternatively for approx. 4 h at approx. 21°C followed by approx. 15 h at 35 - 40°C). The resistance to chemical stress like acids, caustic solutions, solvents, salts, gases, etc. depends on the concentration, temperature and duration of the exposure. Further details can be given on request.

Surface preparation

- All repair spots must be mechanically roughened to achieve a metallic bright surface; depending on the

condition of the repair spot by blasting, cutting, grinding

- All repair spots must be free of grease
- Subsequent cleaning by wiping, sweeping, blowing off or exhausting

Processing data

Mixing ratio by:	Weight	Volume
MM-metal UW	4	2
Hardener UW3 o. UW9 o. UW30	1	1
Tool		Measuring cup

Processing data for use with Hardener UW3

Temperature	Pot life	Curing
0 °C	7 min	90 min
3 °C	6 min	30 min
10 °C	5 min	20 min
20 °C	3 min	10 min
25 °C	2 min	8 min
30 °C	1,5 min	5 min

Processing data for use with Hardener UW9

Temperature	Pot life	Curing
3 °C	20 min	24 h
10 °C	18 min	20 h
20 °C	9 min	60 min
25 °C	6 min	15 min
30 °C	5 min	14 min

Processing data for use with Hardener UW30

Temperature	Pot life	Curing
10 °C	60 min	24 h
20 °C	30 min	2 h
25 °C	20 min	40 min
30 °C	15 min	30 min
40 °C	7 min	20 min

The processing of MM-metal UW with Hardener UW 30 shouldn't be carried out below + 5 °C.

Hints for the processing under water

During the application of MM-metal UW under water the water temperature, accessibility of the repair site, maximum permissible curing/repair time etc are essential for the choice of the suitable hardener. The following information can be used as guidance for the choice of the hardener.

MM-metal UW with Hardener UW3

Water temperature	Pot life	Curing
0-2 °C	8 min	6 h

MM-metal UW with Hardener UW9

Water temperature	Pot life	Curing
2-3 °C	55 min	24 h
5 °C	35 min	20 h
10 °C	20 min	20 h
15 °C	15 min	2 h
20 °C	12 min	1 h

MM-metal UW with Hardener UW30

Water temperature	Pot life	Curing
5 °C	95 min	48 h
10 °C	70 min	24 h
15 °C	45 min	20 h

20 °C	35 min	3 h
25 °C	25 min	2,5 h

Under water MM-metal UW can be processed easily with the hands.

Application instruction

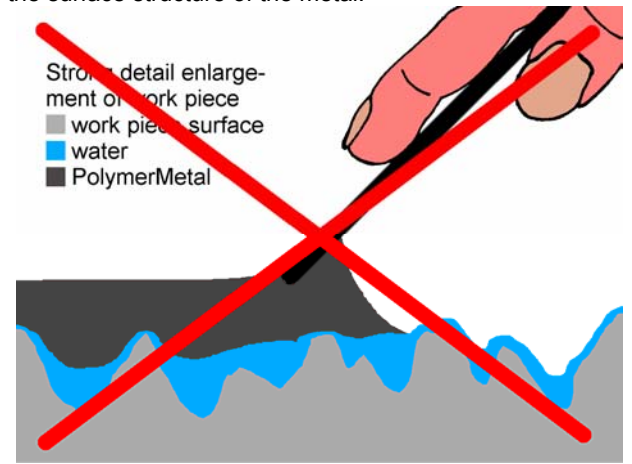
Before mixing the components the work piece should be prepared in accordance with the surface preparation. Always use clean tools for the removal of the components to avoid a reaction within the tins. We recommend mixing only the quantity of material which can be processed within the pot life. Especially in case of using Hardener UW3 the curing starts very fast.

The available measuring cups can be used to measure the required volume parts of the components. The big measuring cup is for the use of MM-metal UW, the small cup is for Hardener UW. Measuring cups must be filled to marking.

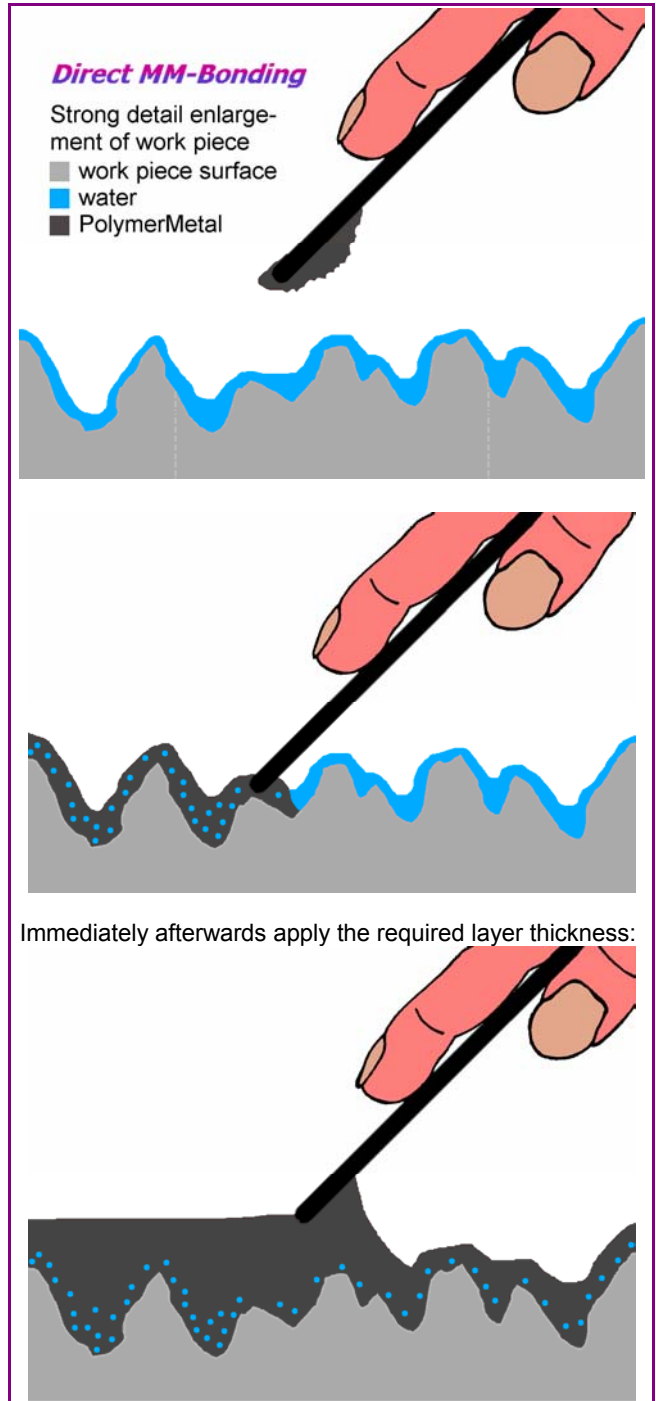
Under consideration of the mixing ratio the components must be mixed very thoroughly.

To achieve good bonding properties on the prepared metal surface, the mixture (the PolymerMetal) must penetrate the water.

False! The PolymerMetal does not form a compound with the surface structure of the metal:



True! Apply a thin first layer of the PolymerMetal by using a spatula or any other suitable tool and rub it in with pressure in criss-cross fashion several times. Hereby the water film is broken up, absorbed and integrated into the PolymerMetal:



Immediately afterwards apply the required layer thickness:

Under water the PolymerMetal can be easily worked and formed by hand.

When pressurised systems should be sealed, the PolymerMetal must be continuously applied to the leakage and rubbed in until curing sets in. Herewith the formation of water channels in the still soft PolymerMetal is avoided. When sealing a leakage, possibly a second overlapping layer should be applied afterwards.

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 again



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before applying the PolymerMetal

Reinforcement

If Fabric tapes (glass fibre or stainless steel) are used, the fibres should be completely coated from both sides when embedded in the PolymerMetal. Several layers increase strength.

Working security

Avoid eye and skin contact. In case of skin contact, wash thoroughly with soap and water. In case of eye contact, rinse thoroughly with water.

Storage

Both components (MM-metal UW + Hardener UW) can be stored for at least 2 years, if kept at temperatures below 25 °C (Hardener UW3 below approx. 8 °C (i.e. in refrigerator)). The materials do not lose their high quality performance after repeated openings of the containers.

Order information

No.	Product	Unit
1160	MM-metal UW, powdery	1000 g
1170	Hardener UW3, liquid	250 g
1180	Hardener UW9, liquid	250 g
1190	Hardener UW30, liquid	250 g
116	MM-metal UW, powdery	500 g
117	Hardener UW3, liquid	125 g
118	Hardener UW9, liquid	125 g
119	Hardener UW30, liquid	125 g

Economicalness	Used quantity	Area	Volume
MM-metal UW	1000 g	1250 g	0,455 m ² 455 cm ³
Hardener UW	250 g		
MM-metal UW	800 g	1000 g	0,364 m ² 364 cm ³
Hardener UW	200 g		
MM-metal UW	2200 g	2750 g	1 m ² 1000 cm ³
Hardener UW	550 g		

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

No.	Accessories	Unit
18	Fabric tape (stainless steel)	100 x 10 cm
20	Fabric tape (glass fibre)	1000 x 5 cm

MM-metal UW is also available in:

No.	Product	Unit
802	MM-Basic Set	1 pc
805	MM-Set UW	1 pc

Availability

Technical data sheets are generally available in German or English language. MM-metal UW 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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