



## Technical Data Sheet

# MM-metal UW

PolymerMetal for repairs under water or on wet metal surfaces



**MultiMetall**  
the MetalExistenceCompany®

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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, which can be combined either with Hardener UW3 or Hardener UW9 offering different processing times. Two hardener components facilitate an efficient and practise-orientated use. Hardener UW3 is preferred for the first coating when leakages shall be sealed. Hardener UW9 is advantageous 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 coefficient of thermal expansion 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 <sup>3</sup>

### Chemical resistance

Already after curing a good resistance is existent; a higher 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, 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 or UW9	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

### 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

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

### Application instruction

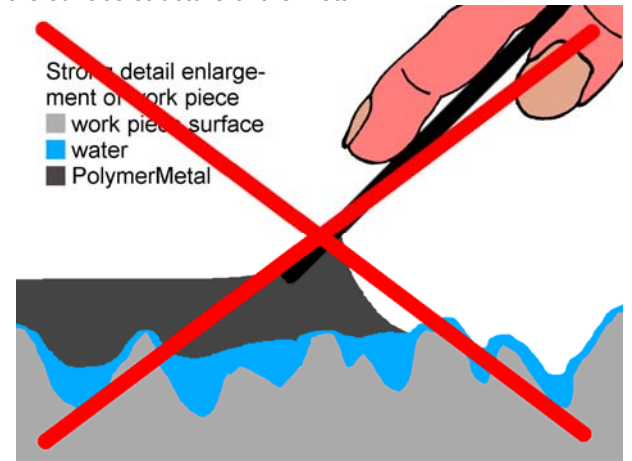
Before mixing the components the work piece should be prepared in accordance with the surface preparation. Always use clean tools for the removal of the components to avoid a reaction within the tins. We recommend mixing only the quantity of material which can be processed within the pot life. Especially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

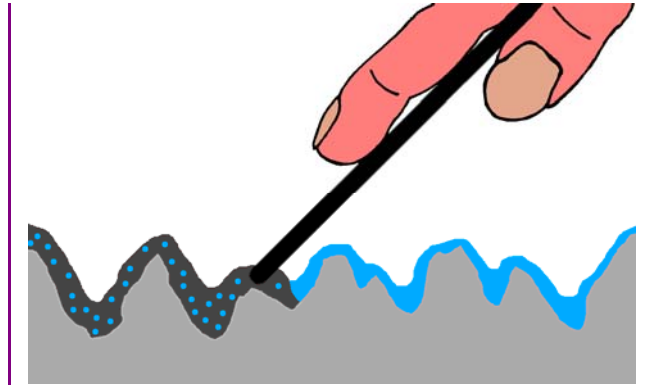
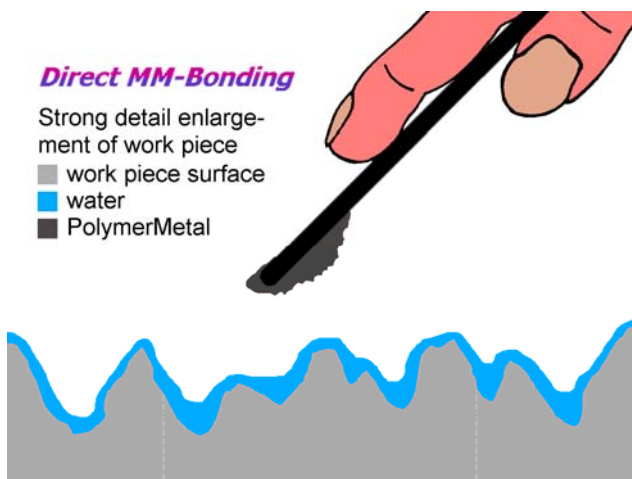
Under consideration of the mixing ratio the components must be mixed very thoroughly.

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

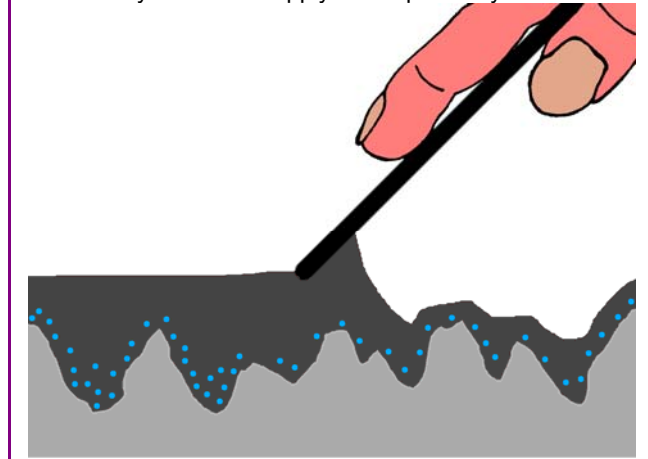
**False!** The PolymerMetal does not form a compound with the surface structure of the metal:



**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.

If the PolymerMetal will be applied to a still leaking repair spot and any water escapes during the application process, the following is recommended: due to the shorter curing time Hardener UW3 should be used to avoid the formation of new water channels in the continuing soft PolymerMetal. Good manual skills and some practise favour a good repair success.

The PolymerMetal must be applied on the leakage with some pressure and continuously rubbed in firmly in criss-cross fashion until the initial curing sets in.

When sealing a leakage, 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, preferably by careful light blasting, before applying the next coating.

#### 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.

### 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

Product	Temperature commendation	Shelf life
MM-metal UW	~ 22 °C	min. 2 years
Hardener UW3	2 ... 10 °C (refrigerator)	min. 2 years
Hardener UW9	~ 22 °C	min. 2 years

The storing of the high-reactive Hardener UW3 at higher temperatures, even over short periods only, can lead to a shorter shelf life. However, the basis MM-metal SQ, which is sensitive to low temperatures, must not be stored in the refrigerator. Even after repeated openings of the containers the high quality performance is preserved.

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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### Order information

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

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

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

No.	Accessories	Unit
33	Mixing plate (synthetic material)	20 x 12 cm
16	Mixing stick (stainless steel)	pc
15	Mixing cup (synthetic material)	pc
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

MM-metal UW is also available in:

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