



Technical Data Sheet

MM-metal oL-steelceramic

PolymerMetal for repairs and maintenance of oily, greasy
or fuel contaminated metals and alloys



MultiMetall
the MetalExistenceCompany®

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Technical Data Sheet

MM-metal oL-steelceramic

Product description



MM-metal oL-steelceramic is a PolymerMetal tested and certified for the repair of oily, greasy or fuel contaminated metals and alloys in case of stress due to cracks, corrosion, abrasion, impact or

chemicals. The bonding with the substrate of dirty metallic surfaces accompanying high technical data and good chemical resistance characterise MM-metal oL-steelceramic.

MM-metal oL-steelceramic is a two-component-product and can either be used with Hardener yellow or Hardener red. Hardener yellow offers better technical data; Hardener red is suitable for emergency and quick repairs or at non high-stressed repair spots because of the considerably shorter curing times. After the usage of Hardener red another overlapping coat with Hardener yellow is always recommended.

MM-metal oL-steelceramic is certified by „Lloyds Register of Shipping“.

Technical data

Application consistency:	pasty
Colour after curing:	dark grey
Specific passage resistance:	$5,3 \times 10^{14} \Omega \text{cm}$
Passage resistance:	$7,52 \times 10^{12} \Omega$
Corrosion:	none
Electrochemical corrosion (DIN 50900):	none
<u>Machinability:</u>	with SiC-grinding plates or Diamond tools by dry cut
Cutting speed:	$v_c = 60 - 125 \text{ m/min}$
Cutting depth:	$a_p = 0,5 - 1 \text{ mm}$
Feed:	$f = 0,1 - 0,2 \text{ mm/r}$

Technical data for use with Hardener yellow

Compressive strength (DIN ISO 604):	200 MPa (29000 psi)
Tensile strength:	80 MPa (11600 psi)
Bending strength (DIN 53452):	78 MPa (11310 psi)
Tensile shearing strength on steel:	31 MPa (4495 psi)
Brinell hardness (DIN 50351):	34
Linear coefficient of thermal expansion at 25-45 °C:	$5,1 \times 10^{-6} \text{ K}$
Pressure-tight up to:	300 bar (4350 psi)
Temperature resistance:	-150 °C to +280 °C
Roughness grade after use of diamond-equipped tools:	3,4 μm
Density (mixed components):	2,44 g/cm ³

Technical data for use with Hardener red

Compressive strength (DIN ISO 604):	93 MPa (13485 psi)
Tensile strength:	49 MPa (7105 psi)
Bending strength (DIN 53452):	67 MPa (9715 psi)
Tensile shearing strength on steel:	19 MPa (2755 psi)
Pressure-tight up to:	100 bar (1450 psi)
Temperature resistance:	-150 °C to +120 °C
Density (mixed components):	2,12 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
- Fresh oil, grease or fuel contaminations (i.e. caused by leakages) do not need to be removed, however dirt residues like rust or paint must be removed
- Subsequent cleaning by wiping, sweeping, blowing off or exhausting

Processing data for use with Hardener yellow

Mixing ratio by:	Weight	Volume
MM-metal oL-steelceramic	20	8
Hardener yellow	1	1
Tool		Measuring spoon yellow

Temperature	Pot life	Curing
5 °C	60 min	5 days
15 °C	45 min	2 days
20 °C	30 min	24 h
25 °C	25 min	20 h
30 °C	20 min	18 h

The processing shouldn't be carried out below + 5 °C.

Processing data for use with Hardener red

Mixing ratio by:	Weight	Volume
MM-metal oL-steelceramic	5	2
Hardener red	1	1
Tool		Measuring spoon red

Temperature	Pot life	Curing
5 °C	10 min	6 h
15 °C	5 min	2,5 h
20 °C	4 min	45 min
25 °C	3,5 min	40 min
30 °C	3 min	35 min

The processing shouldn't be carried out below + 5 °C.

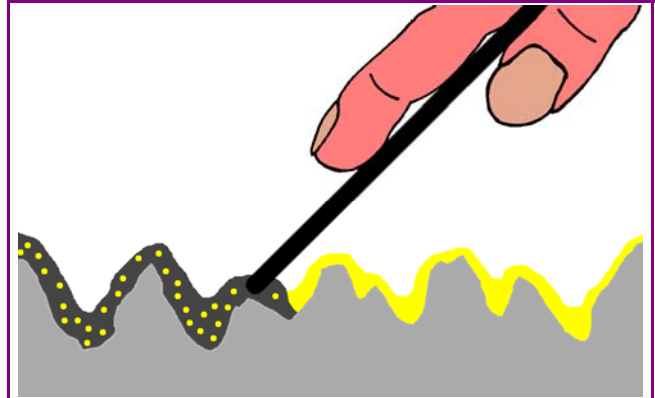
Application instruction

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 red the curing starts very fast.

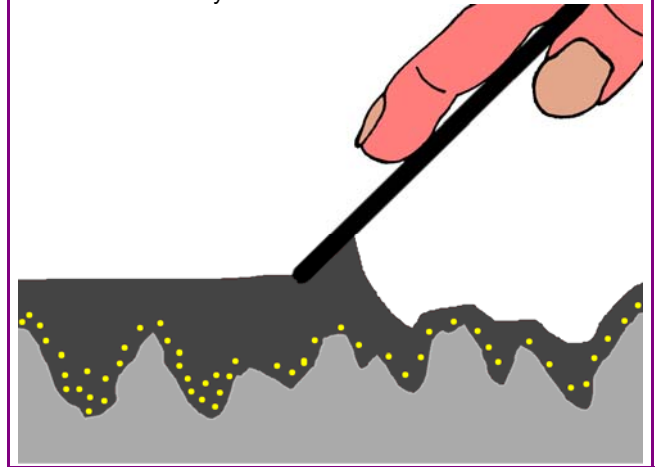
The available measuring spoons yellow (or measuring spoons red) can be used to measure the required volume parts of the components. The big measuring spoon is for the use of MM-metal oL-steelceramic, the small spoon is for Hardener yellow (respectively for Hardener red). Spoons must be filled levelled.

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

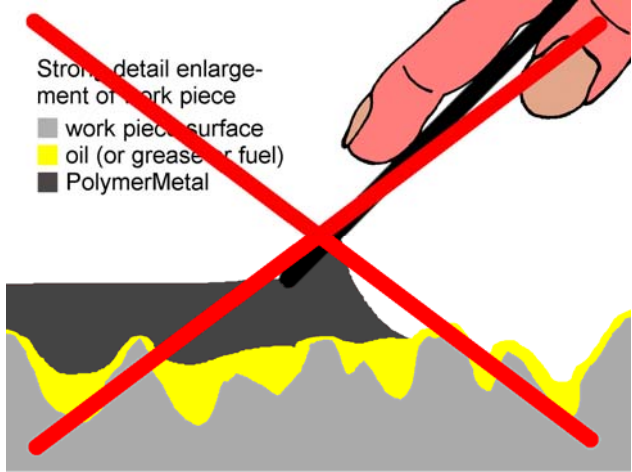
To achieve good bonding properties on the prepared metal surface, the mixture (the PolymerMetal) must penetrate all fresh oil, grease or fuel contaminations.



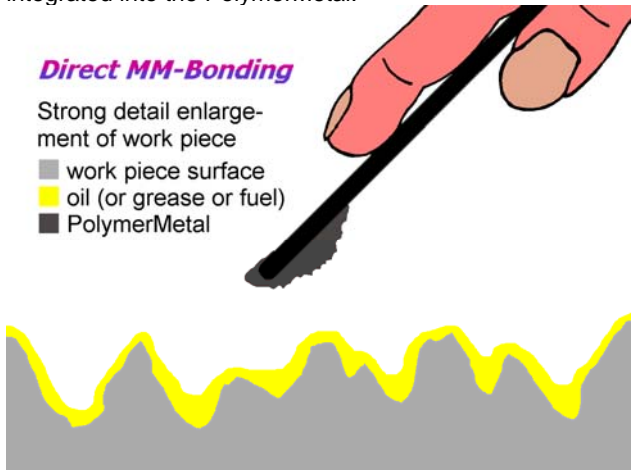
Immediately afterwards apply the required layer thickness on the still soft PolymerMetal:



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 fresh oil, grease or fuel contaminations are absorbed and integrated into the PolymerMetal:



If the PolymerMetal will be applied to a still leaking repair spot and any liquid or gas escapes during the application process, the following is recommended: due to the shorter curing time Hardener red should be used to avoid the formation of new oil channels in the continuing soft PolymerMetal. At difficult repair spots (bigger emersion quantities, higher pressures) it can be helpful to wait with the application of the PolymerMetal after having mixed the components to achieve a quick curing without inclusion of bigger emersion quantities. 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.

After a first coating with Hardener red preferably a second overlapping coat with Hardener yellow should be carried out to achieve the better technical data – in particular whenever leakages are sealed.

All used tools should be cleaned straight after use.

Multiple coating

Application of a successive layer on
MM-metal oL-steelceramic / Hardener yellow

At work piece temperature	apply successive layer after
approx. 15 - 17 °C	approx. 3 h 30 min
approx. 20 - 22 °C	approx. 90 min
approx. 28 - 30 °C	approx. 80 min

At a work piece temperature of 29 °C for example a

successive layer should be applied approx. 80 min after mixing the PolymerMetal for the previous layer.

If the previous coating is already partly cured, a surface preparation must be carried out by roughening the previous coating, preferably by careful light blasting, before applying the next coating.

Application of a successive layer on
MM-metal oL-steelceramic / Hardener red

The application of a successive layer can be carried out after the previous layer has partly cured without the necessity of a surface preparation.

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.

Aftercuring

The mechanical, thermal and chemical properties of MM-metal oL-steelceramic can be improved by aftercuring, when warming up the metallic substrate for approx. 2 hours at approx. 100 °C after partial curing or curing.

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 SS-steelceramic	~ 22 °C	min. 5 years
Hardener yellow	~ 22 °C	min. 5 years
Hardener red	~ 22 °C	min. 5 years

Even after repeated openings of the containers the high quality performance is preserved.

Order information

No.	Product	Unit
2460	MM-metal oL-steelceramic, pasty	1000 g
249	Hardener yellow, pasty	50 g
248	Hardener red, pasty	100 g
246	MM-metal oL-steelceramic, pasty	500 g
253	Hardener yellow, pasty	25 g
248	Hardener red, pasty	100 g

Economicalness	Used quantity	Area	Volume
oL-steelceramic	1000 g	1050 g	0,431 m ² 431 cm ³
Hardener yellow	50 g		
oL-steelceramic	952 g	1000 g	0,410 m ² 410 cm ³
Hardener yellow	48 g		
oL-steelceramic	2321 g	2437 g	1 m ² 1000 cm ³
Hardener yellow	116 g		

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

Economicalness	Used quantity	Area	Volume
oL-steelceramic	1000 g	1200 g	0,566 m ² 566 cm ³
Hardener red	200 g		
oL-steelceramic	833 g	1000 g	0,472 m ² 472 cm ³
Hardener red	167 g		

oL-steelceramic	1766 g	2119 g	1 m ² 1000 cm ³
Hardener red	353 g		

The areas were achieved at a layer thickness of 1 mm. To process a complete 1000 g tin of MM-metal oL-steelceramic with Hardener red, 2 tins of Hardener red are required.

No.	Accessories	Unit
33	Mixing plate (synthetic material)	20 x 12 cm
16	Mixing stick (stainless steel)	pc
15	Mixing cup (synthetic material)	pc
25	Measuring spoon red	set
26	Measuring spoon yellow	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

MM-metal oL-steelceramic is also available in:

No.	Product	Unit
802	MM-Basic Set	pc
804	MM-Set oL	pc

Availability

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