



Technical Data Sheet

# MM-metal SS-steel

PolymerMetal for repairs of constructions made of steel and iron



**MultiMetall**  
the MetalExistenceCompany®

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## Technical Data Sheet

# MM-metal SS-steel

### Product description



MM-metal SS-steel is an alloy-related PolymerMetal for the repair of steel and iron materials. The alloying material contained in the polymer possesses all quality standards for the reconstitution of the nominal state in case of

metallic material loss. MM-metal SS-steel eliminates damages at metallic devices caused by mechanical, corrosive and/or chemical stress.

MM-metal SS-steel is a two-component-product and it is available in pasty or liquid application consistency. MM-metal SS-steel pasty does not run and keep its shape during application. MM-metal SS-steel liquid can be poured, injected or applied with a brush.

### Technical data

|  |                                       |
|--|---------------------------------------|
| Application consistency:                             | pasty or liquid                       |
| Colour after curing:                                 | grey                                  |
| Compressive strength (DIN ISO 604):                  | 184 MPa (26680 psi)                   |
| Tensile strength:                                    | 77 MPa (11165 psi)                    |
| Bending strength (DIN 53452):                        | 67 MPa (9715 psi)                     |
| Tensile shearing strength on steel:                  | 30 MPa (4350 psi)                     |
| Brinell hardness (DIN 50351):                        | 32                                    |
| Specific passage resistance:                         | $5,6 \times 10^{13} \Omega \text{cm}$ |
| Passage resistance:                                  | $7,15 \times 10^{11} \Omega$          |
| Linear shrinkage (ASTM D 2566):                      | 0,0002362 cm/cm                       |
| Linear coefficient of thermal expansion at 25-45 °C: | $3,4 \times 10^{-6} \text{ K}$        |
| E-module at 20 °C (DIN EN ISO 6721-5):               | 11.200 MPa (1.624.000 psi)            |
| Temperature resistance:                              | -150 °C to +265 °C                    |
| Corrosion:   | none                                  |
| Electrochemical corrosion (DIN 50900):               | none                                  |
| Machinability:                                       | with standard tools by dry cut        |
| Cutting speed:                                       | $v_c = 40 - 55 \text{ m/min}$         |
| Cutting depth:                                       | $a_p = 0,5 - 1 \text{ mm}$            |
| Feed:  | $f = 0,1 - 0,2 \text{ mm/r}$          |
| Roughness grade after grinding:                      | approx. 0,52 $\mu\text{m}$            |
| Density (mixed components):                          | 2,64 $\text{g/cm}^3$                  |

### 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

- Mechanically rough up the surface by blasting (it is recommended for blasting to use angular grit material; surface finish approx. 75  $\mu\text{m}$ ; 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
- Apply a thin layer of MM-Release agent on the surfaces, that should not bond with the PolymerMetal and polish after a short drying period

### Processing data

| Mixing ratio by:  | Weight   | Volume                 |
|-------------------|----------|------------------------|
| MM-metal SS-steel | 20       | 8                      |
| Hardener yellow   | 1        | 1                      |
| Tool              |          | Measuring spoon yellow |
| Temperature       | Pot life | Curing                 |
| 5 °C              | 70 min   | 5 days                 |
| 15 °C             | 50 min   | 2 days                 |
| 20 °C             | 35 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.

### 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.

The available measuring spoons yellow can be used to measure the required volume parts of the components. The big measuring spoon is for the use of MM-metal SS-steel, the small spoon is for Hardener yellow. 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, brush or any other suitable tool by applying, pouring or injecting.

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.

All used tools should be cleaned straight after use.

### Rapid curing

After application the curing process can be accelerated by heat addition. Here only the metallic substrate and not the PolymerMetal must be warmed up. A temperature of 70 °C over a period of one hour is enough for remarkable good technical data of dimensionally stable layer thicknesses up to 10 mm. The metal temperature should not exceed a maximum of 120 °C. The quick curing procedure can even be carried out at ambient temperatures below 0 °C.

### Multiple coating

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.

### 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 SS-steel 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-steel | ~ 22 °C                  | min. 5 years |
| Hardener yellow   | ~ 22 °C                  | min. 5 years |

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

### Order information

| No. | Product                   | Unit   |
|-----|---------------------------|--------|
| 201 | MM-metal SS-steel, pasty  | 1000 g |
| 249 | Hardener yellow, pasty    | 50 g   |
| 202 | MM-metal SS-steel, liquid | 1000 g |
| 250 | Hardener yellow, liquid   | 50 g   |

  

| Economicalness  | Used quantity | Area   | Volume                                   |
|-----------------|---------------|--------|--|
| SS-steel        | 1000 g        | 1050 g | 0,397 m <sup>2</sup> 397 cm <sup>3</sup> |
| Hardener yellow | 50 g          |        |  |
| SS-steel        | 952 g         | 1000 g | 0,378 m <sup>2</sup> 378 cm <sup>3</sup> |
| Hardener yellow | 48 g          |        |  |

|                 |        |        |                  |                      |
|-----------------|--------|--------|------------------|----------------------|
| SS-steel        | 2518 g | 2644 g | 1 m <sup>2</sup> | 1000 cm <sup>3</sup> |
| Hardener yellow | 126 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      |
| 14  | MM-Release agent, liquid          | 100 ml      |
| 33  | Mixing plate (synthetic material) | 20 x 12 cm  |
| 16  | Mixing stick (stainless steel)    | pc          |
| 15  | Mixing cup (synthetic material)   | pc          |
| 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          |

### Availability

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