Technical Data Sheet

MM-metal
SS-steel 382

PolymerMetal and construction material
with excellent technical data

MultiMetall
the MetalExistenceCompany®

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Technical Data Sheet

MM-metal SS-steel 382

Product description

MM-metal SS-steel 382 is a PolymerMetal and construction material, which can optimise the desired material properties. The high performance material MM-metal SS-steel 382 delivers the best technical data under mechanical and physical stress.

MM-metal SS-steel 382 is a two-component-product and it is available in pasty or liquid application consistency.

The very thin product variant is extremely free-flowing and pourable, because of its high surface tension. It can be even injected through very small openings (i.e. diameter of 2 mm).

Technical data

Application consistency:	pasty or liquid
Colour after curing:	grey
Compressive strength (DIN ISO 604):	211 MPa (30595 psi)
Compressive strength (DIN ISO 604) after 3 h after-cured at approx. 130-150 °C:	approx. 245 MPa (35525 psi)
Tensile strength:	80 MPa (11600 psi)
Bending strength (DIN 53452):	110 MPa (15950 psi)
Tensile shearing strength on steel:	30 MPa (4350 psi)
Brinell hardness (DIN 50351):	55
Specific passage resistance:	5,7 x 10^{13} Ωcm
Passage resistance:	7,2 x 10^{11} Ω
Linear shrinkage (ASTM D 2566):	0,0001181 cm/cm
Linear coefficient of thermal expansion at 25-45 °C:	3,6 x 10^{-6} K
E-module at 20 °C (DIN EN ISO 6721-5):	15.600 MPa (2.262.000 psi)
Torsional storage module at 20°C (DIN EN ISO 6721-2):	5.900 MPa (855.500 psi)
Temperature resistance:	-150 °C to +280 °C
Corrosion:	none
Electrochemical corrosion (DIN 50900):	none
Machinability:	with standard tools by dry cut
Cutting speed:	v_c = 40 - 55 m/min
Cutting depth:	a_p = 0,5 - 1 mm
Feed:	f = 0,1 - 0,2 mm/r
Roughness grade after grinding:	approx. 0,52 µm
Density (mixed components):	2,68 g/cm^3

Above mentioned data after curing for 6 days at 21°C
or after curing for 4 h at 21°C followed by 15 h at 35-40°C

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, 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 382	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 382, 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. Injection is possible through cannulas of 2 mm diameter.

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

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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 382 can be improved by aftercuring, when warming up the metallic substrate for approx. 2 hours at approx. 100 °C after partial curing or curing.

Deformation under load (creep characteristics) & Adhesion to steel at deformation

Bonding of 2 steel spicemen
each 10 x 10 x 10 mm
with MM-metal SS-steel 382
Gap (layer thickness)
1 mm and 3 mm respectively
Structural load 20 to 50 kN
Load period 24 h

Test series gap = 1 mm

Pressure in MPa	0	200	250	300	400	500
Deformation in mm	0	0,005	0,0075	0,01	0,025	0,09

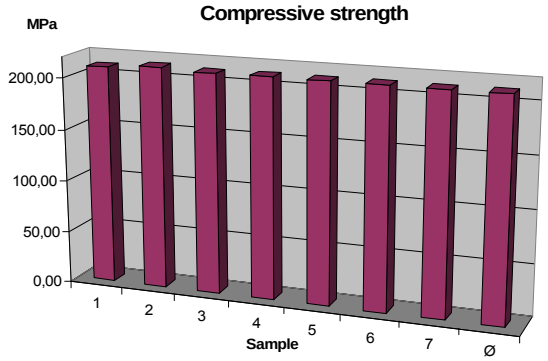
Test series gap = 3 mm

Pressure in MPa	0	200	250	300	350
Deformation in mm	0	0,015	0,02	0,02	0,085

The construction of steel specimen / MM-metal SS-steel 382 was still stable at the end of the testing period of both test series. That means there was neither a breakage nor cracking of the construction material.

Further information about tests concerning the creep characteristics of specimens at a base area of 20 x 10 mm and a height of 10 mm can be provided upon request.

Compressive strength
MM-metal SS-steel 382 was tested at an approved German institute according to DIN EN ISO 604. Here 7 specimens with a base area of 10 x 4 mm and a height of 10 mm were manufactured.



Sample	1	2	3	4	5	6	7	Ø
MPa	209,77	212,94	211,12	211,60	211,55	211,52	211,19	211,38

During additional tests of aftercured samples compressive strengths of Ø 245 MPa were determined.

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 382	~ 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
217	MM-metal SS-steel 382, pasty	1000 g
249	Hardener yellow, pasty	50 g
218	MM-metal SS-steel 382, liquid	1000 g
250	Hardener yellow, liquid	50 g

Economicalness	Used quantity		Area	Volume
SS-steel 382	1000 g	1050 g	0,392 m^2	392 cm^3
Hardener yellow	50 g			
SS-steel 382	952 g	1000 g	0,374 m^2	374 cm^3
Hardener yellow	48 g			
SS-steel 382	2549 g	2676 g	1 m^2	1000 cm^3
Hardener yellow	127 g			

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

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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 382 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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