Technical Data Sheet

Ceramium®

PolymerCeramic with maximum wear resistance
against continuous material loss on metallic surfaces

MultiMetall

the MetalExistenceCompany®

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Ceramium®

Product description

Ceramium offers maximum wear resistance against continuous material loss on metallic surfaces. With tough hard layers, Ceramium protects against erosion, abrasion, cavitation or corrosion in case of dry or wet or chemical stress.

Ceramium is a two-component-product and it is available in pasty or liquid application consistency.

Technical data

Application consistency:	pasty or liquid	
Colour after curing:	grey	
Compressive strength (DIN ISO 604):	148 MPa (21460 psi)	
Tensile strength:	79 MPa (11455 psi)	
Bending strength (DIN 53452):	77 MPa (11165 psi)	
Tensile shearing strength:	MPa	psi
on steel:	28	4060
on aluminium:	26	3770
on brass:	23	3335
on copper:	21	3045
on bronze:	22	3190
Brinell hardness (DIN 50351):	28	
Specific passage resistance:	$5{,}1 \times 10^{14}$ Ωcm	
Passage resistance:	$7{,}4 \times 10^{12}$ Ω	
Linear coefficient of thermal expansion at 25-45 °C:	$5{,}9 \times 10^{-6}$ K	
Temperature resistance:	-150 °C to +260 °C	
Corrosion:	none	
Electrochemical corrosion (DIN 50900):	none	
Machinability:	with SiC-grinding plates or Diamond tools by dry cut	
Cutting speed:	v_c = 60 - 125 m/min	
Cutting depth:	a_p = 0,5 - 1 mm	
Feed:	f = 0,1 - 0,2 mm/r	
Roughness grade after use of diamond-equipped tools:	3,4 µm	
Density (mixed components):	2,03 g/cm³	

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

- Immoderate quantities of salt accumulations in pitting may require wet blasting followed by dry blasting. Alternatively, dry blasting followed by high pressure fresh water cleaning, drying and finally, dry blasting again is possible.
- Mechanically rough up the surface by blasting (it is recommended for blasting to use angular grit material; surface finish approx. 75 µm; 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 Ceramium and polish after a short drying period

Processing data

Mixing ratio by:	Weight	Volume
Ceramium	100	6
Hardener CE	8	1
Tool		Measuring cup

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 cups can be used to measure the required volume parts of the components. The big measuring cup is for the use of Ceramium, the small cup is for Hardener CE. Measuring cups must be filled to marking.

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

Depending on the application consistency the mixture 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 material with pressure onto the work piece to avoid air bubbles in the interface between metal and material ensuring a good surface contact. Immediately afterwards apply the required layer thickness on the still soft material.

All used tools should be cleaned straight after use.

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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 material 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 PolymerCeramic. Several layers increase strength.

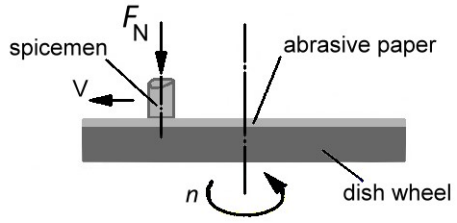
Aftercuring

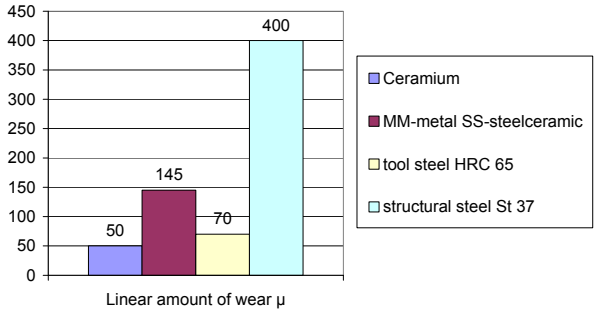
The mechanical, thermal and chemical properties of Ceramium can be improved by aftercuring, when warming up the metallic substrate for approx. 2 hours at approx. 100 °C after partial curing or curing.

Wear resistance

Ceramium offers maximum wear resistance against continuing material loss on metallic surfaces.

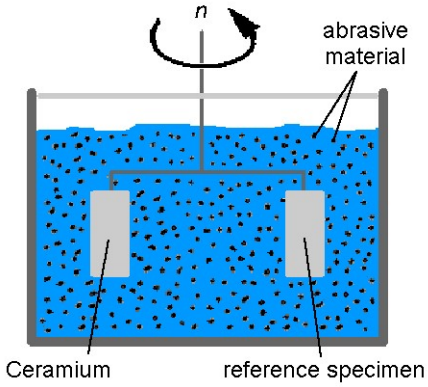
Dry wear test - Test data tribometer:
abrasive paper = silicon carbide paper, grain size 180
F_N = 60 N / Turning speed n = 120 U/min /
feed v = 1,5 mm/U

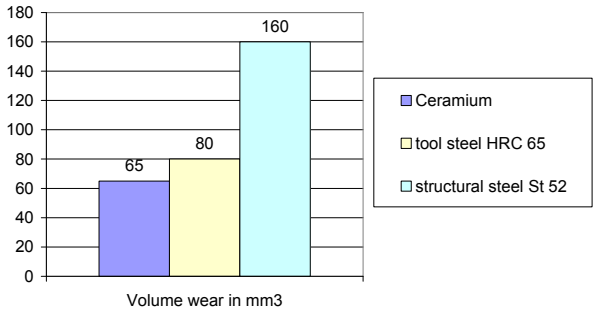




This kind of tribological stress during the tests corresponds to the sliding abrasion (three body abrasion, abrasion) according to DIN 50320.

Wet wear test - Test data tribometer:
Duration of test 16 h / testing medium water with SiC in different viscosities / grain size 0 - 0,1 mm / temperature appr. 60 °C / turning speed n 1600 U/min





This kind of tribological stress during the tests corresponds to the particle erosion (erosion wear, abrasion) according to DIN 50320.

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
Ceramium	~ 22 °C	min. 5 years
Hardener CE	~ 22 °C	min. 5 years

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

Order information

No.	Product	Unit
601	Ceramium, pasty	695 g
611	Hardener CE, pasty	55 g
602	Ceramium, liquid	695 g
607	Hardener CE, liquid	55 g

Economicalness	Used quantity		Area	Volume
Ceramium	695 g	750 g	0,369 m^2	369 cm^3
Hardener CE	55 g			
Ceramium	926 g	1000 g	0,492 m^2	492 cm^3
Hardener CE	74 g			

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Ceramium	1881 g	2032 g	1 m^2	1000 cm^3
Hardener CE	151 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
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

Ceramium, liquid is also available in:

No.	Product	Unit
802	MM-Basic Set	pc

Availability
Technical data sheets are generally available in German or English language. Ceramium 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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