

3M™ Ceramic Material

Excellent corrosion resistance of 3M™ Silicon Carbide, 3M™ Silicon Nitride and 3M™ Boron Carbide.

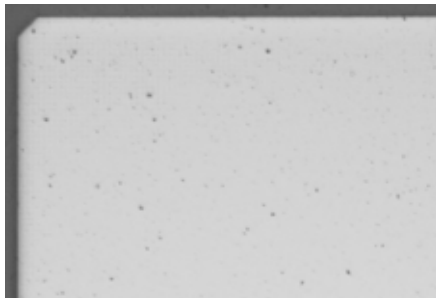
Comparison of the materials (in aqueous media)*

3M™ Silicon Carbide (formerly known as EKasic®)														3M™ Silicon Nitride		3M™ Boron Carbide	
Material	Symbol / Unit	Grade F		Grade C		Grade G		Grade P		Grade F plus		Grade T plus		Grade S			
Temperature	[°C]	120	220	120	220	120	220	120	220	120	220	120	220	120	220	120	220
Medium																	
Deionised water	DI-H ₂ O	++	++	++	++	++	+	++	+	++	++	+	-	+	0	+	-
Concentrated acids (pH<0)																	
Phosphoric acid	H ₃ PO ₄ (85%)	++	++	++	++	++	++	++	+	++	++	0	--	++	+	+	0
Sulfuric acid	H ₂ SO ₄ (96%)	++	++	++	++	++	++	++	++	++	++	++	0	++	+	++	+
Nitric acid	HNO ₃ (65%)	++	+	++	+	++	++	++	+	++	+	++	++	+	0	+	--
Hydrochloric acid	HCl (32%)	++	++	++	++	++	++	++	++	++	++	0	--	-	--	++	+
Hydrofluoric acid	HF (40%)	+	0	+	-	+	--	0	--	+	0	0	-	0	-	++	+
Hydrofluoric acid / Nitric acid mixture	HF / HNO ₃ (1:1)	0	--	0	--	0	--	-	--	0	--	-	--	-	--	0	--
Concentrated alkalines (pH>14)																	
Sodium hydroxide	NaOH (30%)	++	++	++	++	++	++	++	++	++	++	0	--	-	--	++	+
Potassium hydroxide	KOH (30%)	++	+	++	+	++	+	++	+	++	+	++	+	-	--	++	+

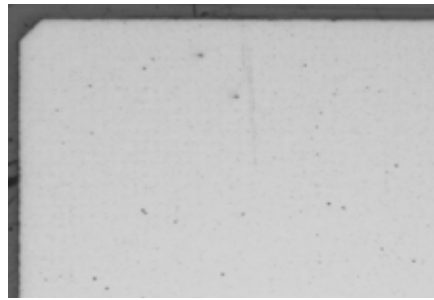
* This general information is based on results of static corrosion tests with a duration of 168 hours. The corrosion attack is characterized by the remained, uneffected, load bearing cross sectional area of the test bars. Legend: 100.0 – 99.00% = (++); 98.99 – 95.00% = (+); 94.99 – 90.00% = (0); 89.99 – 85.00% = (-); < 85.00% = (--)

Remark: Experiences in the field show that under tribo-chemical corrosion loading 3M™ Silicon Carbide Grade C exhibits significantly improved resistance compared to 3M™ Silicon Carbide Grade F. Such conditions can not be realized in lab tests.

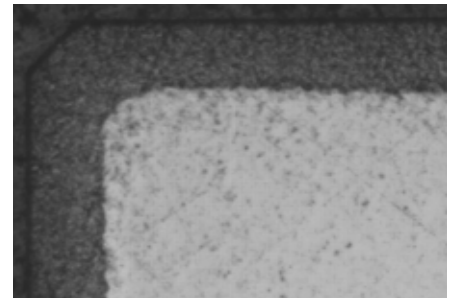
Optical microscope images of polished cross sections of samples after corrosion tests in phosphoric acid at 220 °C for 168 hours.



3M™ Silicon Carbide Grade F (++)



3M™ Silicon Carbide Grade C (++)



3M™ Silicon Carbide Grade T plus (- -)



3M™ Silicon Nitride Grade S (+)



3M™ Boron Carbide (0)

1,000 µm

Product is manufactured and sold by 3M Technical Ceramics, Zweigniederlassung der 3M Deutschland GmbH.

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3M Technical Ceramics
Zweigniederlassung der
3M Deutschland GmbH
Max-Schaidhauf-Straße 25
87437 Kempten, Germany
T +49 (0)831 5618-0
F +49 (0)831 5618-345
info.technical-ceramics@3M.com
www.3M.de / Technical-Ceramics

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