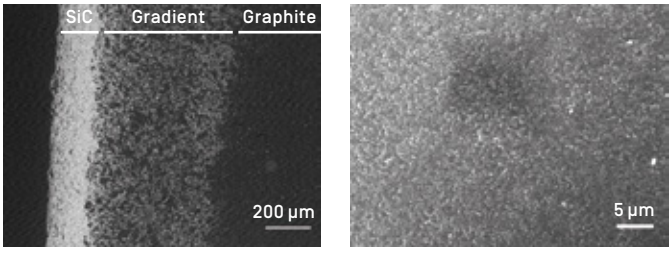
R&D Materials – preliminary data sheet

Surface modified graphite

Silicon carbide gradient coating on graphite

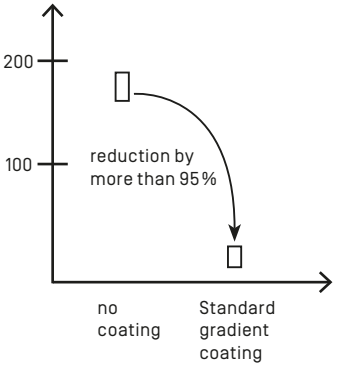


↑ SEM image: Cross-section (left) and top view (right) of SiC gradient coatings on graphite

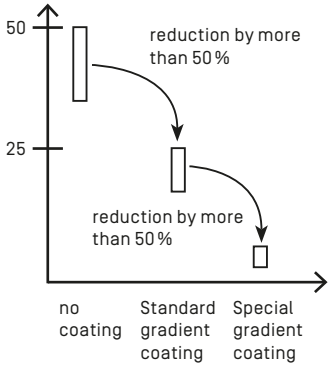
A silicon carbide gradient coating on graphite provides
- enhanced abrasion/erosion stability
- increased oxidation stability
- enhanced interlocking between SiC and graphite
- adapted interface for other conventional coatings.

Depending on application requirements, the SiC gradient coating can be adjusted to customer needs.

Oxidation rate at 1000 °C[1] [mg/cm²h]



Wear rate[2] [mg/cm²h]



Typical material data of graphite with silicon carbide gradient coating*

Typical properties	Units	Grade A	Grade B	Grade C
Apparent density	g/cm³	1.9	1.8	1.6
Young's modulus	GPa	15	14	10
4P-Flexural strength	MPa	25	20	7
Surface roughness (Ra)**	µm	3	6	14
Martens hardness***	N/mm²	330	310	180

* Values corresponding to test specimen size Ø 30 mm x 110 mm
** Additional polishing possible
*** Values corresponding to test load of 100 N

[1] SGL internal test in air atmosphere

[2] Kucher et al., "Characterization of carbonaceous materials with respect to slurry-abrasion", Carbon Conference 2010, ACS.

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