

Schunk – Molded Bipolar Plates for Fuel Cells

Molded Bipolar Plates



Selected raw materials for bipolar plates

Material Technology

Schunk materials allow a very high fuel cell performance.

These materials are specially selected and qualified for fuel cells backed by Schunk's 90 years of expertise with graphite and carbon materials.

Continuous compound production permits utmost homogeneity and highest material quality.

Manufacturing Technology

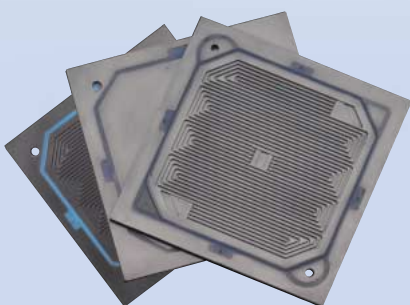
We apply low-cost molding processes for serial production of bipolar plates as well as CNC machining for manufacturing of prototype plates.

Schunk's experienced in-house tool shop uses the most advanced equipment for mold manufacturing.

We offer support to promote designs that are highly compatible with our molding process and our modular mold technology.

Advanced Fuel Cell Components

Schunk Kohlenstofftechnik GmbH offers bipolar plates with directly integrated profiled seals.



Further Advantages of Schunk Bipolar Plates

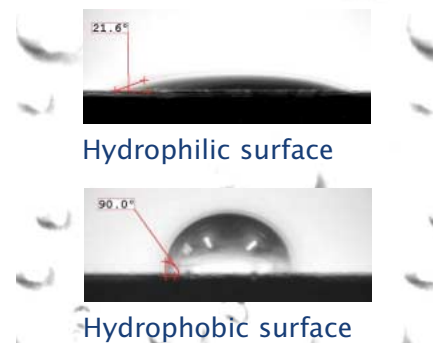
Schunk product quality has been proven over the years for a wide range of fuel cell applications.

Schunk plates have an excellent electrical and thermal conductivity (as rated by our customers).

Schunk has certified its design, development and manufacture processes by EN ISO 9001.

Special hydrophilic or hydrophobic surface modifications

improve the operational characteristics of Schunk bipolar plates without influencing their favorable electrical properties.



In a joint development effort Schunk Kohlenstofftechnik and Freudenberg Fuel Cell Component Technologies have integrated 3D-structured seals into molded plates.

Real application tests confirm that these 3D seals prevent leakage at relatively low contact pressure.

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Properties of Schunk Grades for PEFC, DMFC and HT-PEFC

	FU4369	FU4369HT
Application	Standard grade for machined prototype and molded plates PEM / DMFC	Standard grade for machined prototype and molded plates HT-PEM
PHYSICAL PROPERTIES		
Density		1.90 g·cm ⁻³
Water absorption		0.15 %
Minimum web thickness		0.9 mm
MECHANICAL PROPERTIES		
Hardness HRB10/40		100
Bending strength		40 MPa
Compressive strength		50 MPa
ELECTRICAL PROPERTIES		
Specific electrical resistance in plane xy		90 μΩm
through plane z		190 μΩm
THERMAL PROPERTIES		
Coefficient of thermal expansion		xy / z
20 °C to 60 °C		7 / 20 · 10 ⁻⁶ K ⁻¹
20 °C to 100 °C		11 / 28 · 10 ⁻⁶ K ⁻¹
20 °C to 140 °C		15 / 38 · 10 ⁻⁶ K ⁻¹
Thermal conductivity		55 W/mK
Heat deflection temperature	190 °C	210 °C
Glass transition temperature	170 °C	190 °C

FU 4413 which has been specially developed for thin plates is available on request.

Long Term Stability

Tests performed:

- Various acids for 2000 h at 85 °C and 180 °C (185 °F and 356 °F)
- Mineral oil for 2000 h at 85 °C and 180 °C (185 °F and 356 °F)
- Methanol for 3000 h at 90 °C (194 °F)

Further test results are available on request

The data shown above are not guaranteed, but typical values based on our experience. It should be understood that a spread of results can occur due to variations in materials and production processes.

Schunk – To Power Our Future!



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