



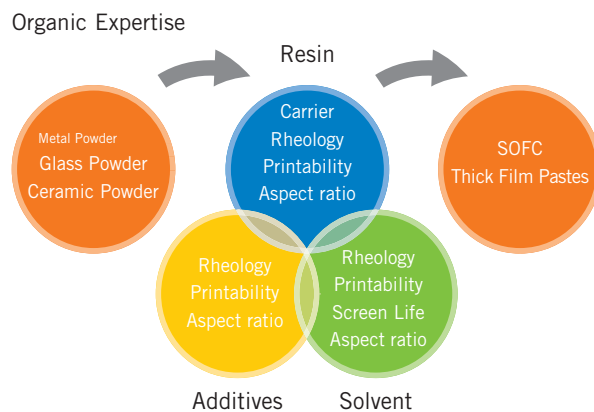
Heraeus Thick Film Materials for Solid Oxide Fuel Cells

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As a world leader in thick film manufacturing and precious metals, the Thick Film Business Unit of Heraeus Precious Metals has been formulating pastes, precious metal powders and glass powders for over 40 years. Materials applicable on different substrates like ceramic and steel and with different application methods are available. Based on this, Heraeus has applied its expertise to Solid Oxide Fuel Cells (SOFC). The product range includes pastes for anodes, electrolytes, cathodes, current collectors, interconnects and sealing glasses. Within each paste type, a wide range of compositions and rheologies is possible.

Beside the standard series of pastes, Heraeus also offers pastes optimization and toll manufacturing services for companies that prefer proprietary control of their inorganic ingredients. Improvements of rheology, homogeneity and print definition allow increasing customers yield.

With manufacturing locations around the globe, the Thick Film Business Unit is able to supply any quantity from grams to tons, helping fuel cell producers scale up to high volume manufacturing quickly and efficiently.



Heraeus offers many services that can facilitate the development of products in the field of fuel cells:

Screen printing prototyping

Firing

- Continuous belt furnaces
- Box furnaces
- Alternate atmosphere belt furnaces

Paste characterization

- Rheology assessment and optimization
- Printability assessment and optimization
- Solids content optimization

Thick film functional screen printable pastes

- Conductors, resistors, dielectrics
- Sealing glasses, overglazes
- Pt and Pt group pastes for high temperature applications
- Oxide materials
- Organic resin vehicles

Precious metal powders

- High conductivity powders
- Flakes
- Oxides
- Binary alloys

Application methods of thick film pastes

- Screen printing
- Dipping
- Spraying
- Dispensing
- Roller coating
- PAD PRINTING

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