

## Fuel Cell Materials

### Product Feature

Heraeus Materials Technology LLC is a leading producer of thick film pastes for SOFC (Solid Oxide Fuel Cell) manufacturing. These pastes include anode, cathode, electrolyte, inner connect and sealing pastes. Paste rheologies are designed for screen printing application, but other rheologies available for pad printing, roller coating or dispensing application.

PASTE	DESCRIPTION
<b>ANODE</b>	
CL82-8520	NiO as a screen printable paste
CL82-8520A	NiO + 8mol% YSZ in a 60/40 ratio
CL82-8520B	NiO + 8mol% YSZ in a 70/30 ratio
CL82-8520C	NiO + 8mol% YSZ in a 80/20 ratio
CL82-9366	NiO + Pore Former, 4% Carbon
CL82-9367	NiO + Pore Former, 8% Carbon
CL82-9368	NiO + 8mol% YSZ in a 60/40 ratio + Pore Former, 8% Carbon
<b>CATHODE</b>	
CL86-8706	LSM conductive perovskite
CL86-8706A	LSM + 8mol% YSZ in a 60/40 ratio
CL86-8706B	LSM + 8%mol% YSZ in a 70/30 ratio
CL86-8706C	LSM + 8%mol% YSZ in a 80/20 ratio
CL86-9200	LSCF
CL86-9300	LSCF + GDC
<b>ELECTROLYTE</b>	
CL90-8705	8 mol% YSZ
CL90-9340	SDC
FCE10060	CeO
<b>CURRENT COLLECTOR</b>	
CL11-5100/CL11-5349	Pt paste for screen printing (CL11-5100) or brushing (CL11-5349)
C5729/C5756	Gold Conductors
C8728	Silver Conductor
CL40-9405	Fritless 70Ag/30 Pd
CL40-10099	Fritless 70Ag/30Pd + 8% pore former
CL40-10053	Fritless 50Ag/50Pd
CL40-10110	Fritless 45Ag/55Pd + 8% pore former
CL40-10042	Fritted 30Ag/70Pd
CL40-10053	Fritless 20Ag/80Pd
CL40-10011	Fritless 10Ag/90Pd
CL10-10041	Fritted 100% Pd
BE226	Fritless 100 Pd
<b>SEALING PASTE</b>	
SD1000	For steel interconnectors
<b>ORGANICS</b>	
V-006A	Lower Viscosity Vehicle
V-015	Higher Viscosity Vehicle
RV-372	Terpineol, thinner

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#### Powder Designations:

YSZ	Yttrium Stabilized Zirconia
LSM	Strontium-doped Lanthanum Manganite
LSCF	Strontium – Cobalt doped Lanthanum Ferrite
SDC	Samarium doped Ceria
GDC	Gadolinium doped Ceria
CeO	Cerium Oxide

#### ● Typical Properties:

##### Screen printable thixotropic paste:

##### Viscosity:

200-400 Kcps, Brookfield RVT Viscometer,  
SC4-14 spindle @ 25°C, 10 RPM

##### F.O.G.:

Less than 20 microns  
4<sup>th</sup> scratch

#### ● Recommended Processing Guidelines:

##### Printing:

200 – 325 stainless steel mesh screen,  
0.5-1.0 mil emulsion

##### Drying:

Dry at 150°C for 10 min

##### Firing:

Air atmosphere belt furnace  
Peak temperature and time at peak  
dependent on material type

##### Thinner:

RV-372 (Terpineol)

##### Storage:

Store in a dry location at 5°C-25°C

##### **DO NOT REFRIGERATE**

Allow paste to come to room temperature prior to opening  
Spatulate well before using

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The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to date on the date this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any patent infringement resulting from its use (unless this is contractually and explicitly agreed in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for a particular application.

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