

FRAUNHOFER IKTS

Fraunhofer IKTS is one of 66 institutes of the Fraunhofer-Gesellschaft in Germany. The majority of the 22,000 staff are qualified scientists and engineers, who work with an annual research budget of 1.9 billion euros.

Fraunhofer IKTS develops state-of-the-art, application-oriented, high-performance ceramic materials; industrial preparation processes using powder technology, wet chemistry, and precursors; and prototype components and systems. With applied fundamental research as our basis and within the framework of R&D projects with partners, we develop concepts for product and process innovations in numerous trendsetting industry sectors, including energy and environmental technology, mechanical and plant engineering, microsystems and medical technology, and vehicle manufacturing.

Fraunhofer IKTS is specialized in the development of customized thick-film pastes for various applications and technologies. Manufacturing and characterizing the required raw materials, technological know-how and a wide range of equipment for the fabrication of thick-film pastes as well as substantial characterization methods for the resulting films are the tools for a successful development. Fraunhofer IKTS has experience using each of them for over 30 years.

CUSTOMER COMMENT

Thick-film pastes for aluminum nitride ceramics made by Fraunhofer IKTS are on top! For over 15 years now we have been metalizing AlN-substrates and components with these tried and trusted pastes. Thus in several fields of application of power electronics and optoelectronics any technical requirement can be realized. We are proud to have Fraunhofer IKTS as a competent and reliable partner on our side.

Dieter Brunner, CEO CoorsTek Advanced Materials ANCerem GmbH

CONTACT

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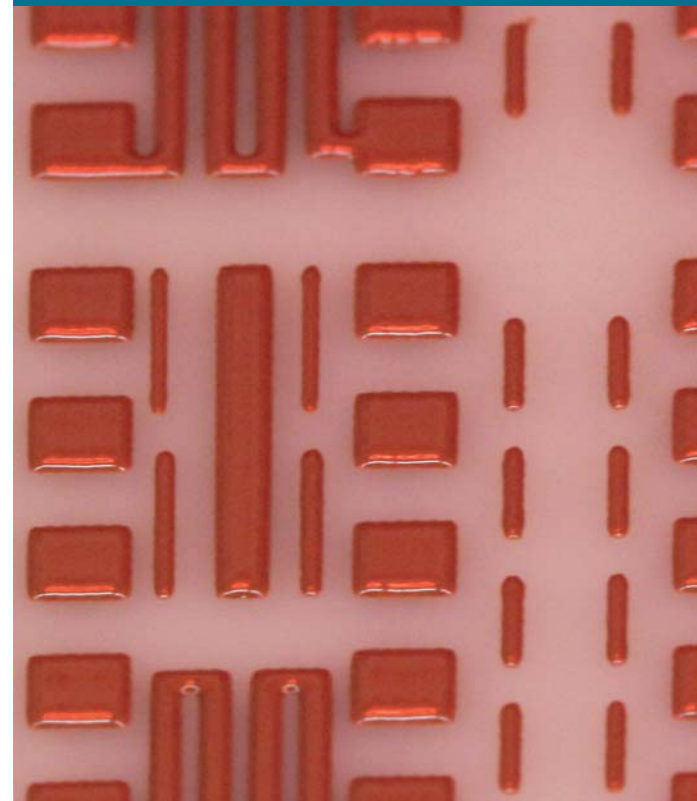
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REACH
compliant

THICK-FILM PASTES FOR ADVANCED POWER ELECTRONICS CUSTOMIZED FUNCTIONAL FILMS





STATUS QUO

TFC thick-film pastes are highly efficient, eco-friendly, resource saving and meet legislative demands like RoHS II and REACH. Reliable processing of the paste is provided by a high homogeneity of paste and film properties as well as excellent brazing and bonding characteristics at a very good printability.

SERVICES OFFERED

Our experience range includes various substrate materials (AlN, Al₂O₃, LTCC, ZrO₂, Si₃N₄, steel) and application fields. For power electronics the substrate material most suitable is aluminum nitride (AlN). It shows a high thermal conductivity, good dielectric properties and thermal, mechanical and chemical durability paired with a coefficient of thermal expansion close to that of silicon. AlN requires the development of a sophisticated material system suitable for all applications.

As a research organization, Fraunhofer IKTS is able to customize pastes for your special requirements. Abundant properties of ceramic powders and years of experience enable us to give a paste almost any property needed in a specific application background: For this reason we call our pastes "Pastemeleons".

REACH COMPLIANT PASTES FOR AlN

RuO₂ resistor pastes

Paste	R [Ω/sq]	TKR [10 ⁻⁶ /K]	MRPD [W/mm ²]
FK9606	6	±200	
FK9611	10	±100	3.5
FK9615	50	±100	
FK9621	100	±100	3.8
FK9631	1000	±100	
FK9632	2000	±200	
FK9636**	6000	±300	

AgPd resistor pastes for heater applications

Paste	R [mΩ/sq]	TKR [10 ⁻⁶ /K]	MRPD [W/mm ²]
FK9921m	0.1	±100	2.0
FK9931m	1	±100	1.0
FK9941m	10	±100	0.6

Conductor pastes

Paste	Alloy	R [Ω/sq]	Application
FK1071	AgPt	≤ 6	Low sheet resistivity
FK1916**	AgPd	≤ 15	
FK1205	AgPd	≤ 25	Solderable resistor contacts
FK1220*	AgPd	≤ 25	
FK1282	AgPt	≤ 35	Highly leaching resistant
FK1574	AgPtPd	≤ 60	Highly leaching resistant against lead-free solds

*) REACH compliance expected for Q1, 2014.

**) New.

Glass pastes

Paste	Application
FK4027	Encapsulation for 650°C
FKM4889	Marking paste, green
FKM4891	Marking paste, white
FKM4893	Marking paste, black
FKM4939	Marking paste, red

CHARACTERIZATION

Pastes

- Viscosity
- Screen printability, wetting behavior
- Stability and homogeneity

Films

- Thickness, roughness, line-space ratio
- Electrical values (sheet resistivity, TCR, STOL with varying conditions)
- Artificial ageing (dry heat, humidity, thermo shock) up to 1000 hours as standard test
- Packaging performance (soldering, bondability, adhesion)
- Industry near testing