

FK4027: ENCAPSULATION PASTE FOR AIN

The encapsulation paste FK4027 is applied as a protective film onto thick-film resistors of the FK9600 and FK9900M resistor paste series, and onto its contacts. This prevents resistance drifts which could result from environmental factors, such as high air humidity or slight mechanical abrasion. Where high film thicknesses are required, the paste should be processed in multiple separate screen printing and firing steps.

PROCESS CONDITIONS

Substrate

The paste is designed for use on AIN substrates (with lapped surfaces) from CoorsTek/ANCeram. Substrates with other surface qualities or from other manufacturers may lead to variations in the results.

Screen printing

Use a stainless steel screen with 200 mesh and a wire diameter of 40 µm, as well as 25 µm emulsion thickness (10 to 12 µm EOM) to achieve the stated film thickness.

Leveling

The printed films should be leveled for 10±2 minutes at room temperature (22 to 25 °C).

Drying

The printed films should be dried for 15 minutes at 150 °C in a drying oven with an exhaust air system or in a continuous flow dryer.

Firing

The printed films should be fired under air atmosphere in a conveyor belt furnace at a peak temperature of 650 °C and with a dwell time of two minutes. Fraunhofer IKTS recommends a total cycle time of 26 minutes.

Storage

The pastes can be stored at any temperature between 4 and 10 °C. The lower the temperature, the better long-term stability. The can must remain tightly sealed during storage. In order to prevent air humidity from condensing on the paste, the can may be opened only after the content has reached room temperature. The paste needs to be sufficiently homogenized before use, e.g. with a spatula.

Safety notice.

For safe handling of the pastes, please observe the notices in the safety data sheet accompanying each delivery.

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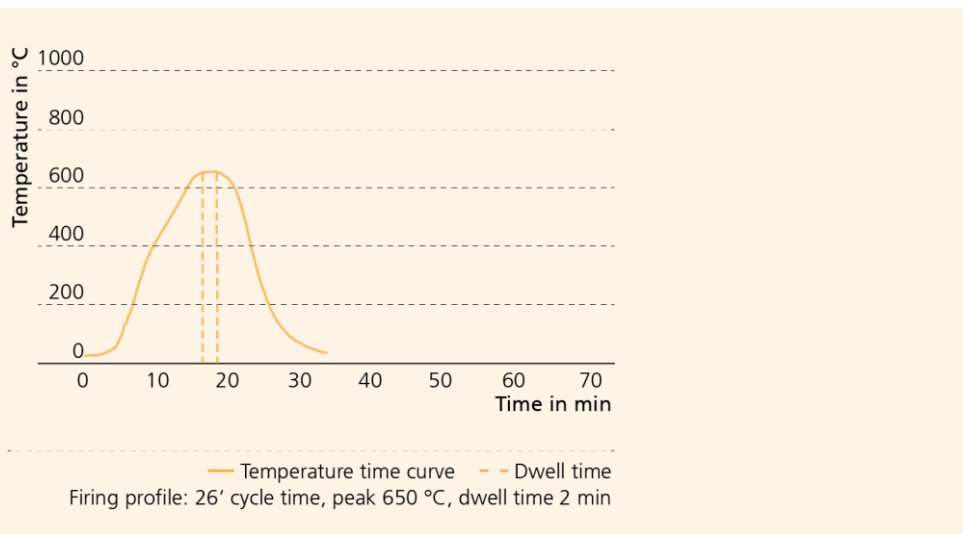
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Quality requirements

An analysis certificate comes included with each delivery. The paste meets current legal requirements according to RoHS II (Directive 2011/65/EC) and REACH (Regulation (EC) No 1907/2006).

Instead of an expiration date, it states a date for retesting, which is six months after the date of delivery. During this period, IKTS warrants the values stated in the analysis certificate for unopened pastes. After the date for retesting has passed, it is the client's responsibility to test the paste quality under the conditions stated in the data sheet.

FIRING PROFILE



TECHNICAL SPECIFICATIONS

Characteristics	Unit	Value
Viscosity ¹	Pa·s	20...50
Color	--	Green
Film surface ²	--	Smooth, glazed
Resistance change ^{2, 3}	%	< 5
Fired film thickness	µm	12±2
Coverage ⁴	cm ² /g	120±5

¹ Brookfield viscometer HB with spindle/cup combination SC4-21/13RP(Y) at n=10 rpm and 25±0.2 °C.

² Firing profile: Total cycle time 26 min, 2 min at 650 °C. Transmitted light.

³ Resistance drift, calculated from resistance values with the geometry 2x2 mm² and a sheet resistance of approx. 50-100 Ohm/Sq before and after firing of layers of FK4027 printed on top.

⁴ Calculated area that can be printed with one gram paste in the recommended thickness.