

FK9900M: AgPd RESISTOR PASTE SYSTEM FOR AlN

The AgPd-based resistor paste systems FK9900M-100 and FK9900M-200, with a temperature coefficient of resistance lower than 100 ppm/K, or lower than 200 ppm/K, respectively, are compatible with the conductor pastes FK1205, FK1916 and FK1953, as well as the encapsulation paste FK4027. Other pastes can be used as conductor paste, but this may result in differing sheet resistance values or temperature coefficients. The pastes listed below may be mixed with each other. It is possible to combine these pastes with those of the FK9600 series without an additional contact layer. To do this, it is required to fire the paste layer before printing the next one. We do not recommend mixing the FK9900M with pastes of the RuO₂-based FK9600 paste series.

PROCESS CONDITIONS

Substrate

The paste is designed for use on AlN 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 280 mesh and a wire diameter of 32 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 850 °C and with a dwell time of 10 minutes. Fraunhofer IKTS recommends a total cycle time of 30 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.

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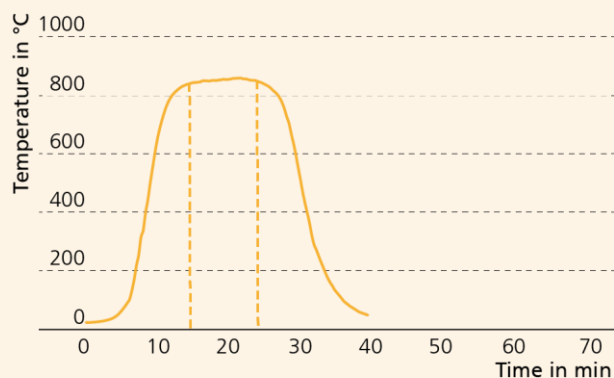
For safe handling of the pastes, please observe the notices in the safety data sheet accompanying each delivery.

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



— Temperature time curve — Dwell time
Firing profile: 30' cycle time, peak 850 °C, dwell time 10 min

TECHNICAL SPECIFICATIONS

Characteristics	Unit	FK9900M-100			FK9900M-200		
		9921	9931	9941	9921	9931	9941
Viscosity ¹	Pa·s	TBD	TBD	TBD	TBD	TBD	TBD
Sheet resistance ^{2, 3}	mOhm/ Sq	100	1.000	10.000	100	1.000	10.000
Shipping specification	%	±20	±20	±20	±20	±20	±20
Hot TCR ^{2, 4}	ppm/K	0±100	0±100	0±100	0±200	0±200	0±200
Cold TCR ^{2, 4}	ppm/K	0±100	0±100	0±100	0±200	0±200	0±200
Dried film thickness	µm	21±2	21±2	21±2	21±2	21±2	21±2
Coverage ⁵	cm ² /g	80±5	95±5	100±5	80±5	95±5	100±5

¹ Brookfield viscometer HB with spindle/cup combination SC4-14I-6RP(Y) at n=10 rpm and 25±0.2 °C.

² Firing profile: total cycle time 30 min, 10 min at 850 °C.

³ Calculated for resistors with the geometry 100x0.5 mm² and a dried thickness of 21±2 µm.

⁴ Hot temperature coefficient of resistance (TCR) between 25 °C and 150 °C, cold temperature coefficient of resistance between -55 °C and 25 °C.

⁵ Calculated area that can be printed with one gram paste in the recommended thickness.