

## Pb free resistor paste RM series for LTCC application

### RM51

#### Main Features:

Pb free paste RM series has excellent long life stability on both of 96% alumina and LTCC substrate by the low thermal expansion. Large coverage by the low specific gravity can supply low material cost.

#### Typical Fired Properties:

Resistivity	$\Omega/\square$	100k
Tolerance of resistivity (batch to batch)	%	$\pm 10$
		$17 \pm 3$
Recommended firing temperature	$^{\circ}\text{C}$	850
Fired thickness	$\mu\text{m}$	$10 \pm 2$
Hot/Cold TCR	ppm/ $^{\circ}\text{C}$	$\pm 100$
$\Delta R\%$ after heat cycle		$\pm 0.3$
	%	
$\Delta R\%$ after 150 $^{\circ}\text{C}$ aging		$\pm 0.3$
T.C.E.	$\times 10^{-7}/^{\circ}\text{C}$	39~52
Viscosity	Pa*s	$160 \pm 40$

Attention: These pastes and powders are materials for industrial use only. Refer to appropriate MSDS and statement of caution.

Notice: Values in each data are not specified, just representative values.

**Coverage**cm<sup>2</sup> /g

230

**Thinner**

TMS-5

**Test Condition:**

Conductor: Pb free AgPt paste TR-3913

Substrate: 96% alumina

Viscosity: Brookfield HBT, SC4-14/6R at 10rpm

Printing: 250 mesh stainless screen with 10 μ m emulsion

Firing: 850°C peak temperature for 10 minutes in 60 min total time.

Resistivity: LxW=2.0mmx1.0mm

TCR: LxW=2.0mmx1.0mm, hot TCR: 25~150°C, cold TCR: -55~25°C

Heat cycle: L\*W =2.0mm\*1.0mm, 1000 cycle as -40°C and 150°C each for 30 minutes  
after laser trimming

150°C aging: 1000 hours after laser trimming

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## Instruction in Using Thickfilm Paste Products

### 1. Storage...

Tight a lid after using and store in dark and cold place. Shelf life depends on the product but usually speaking 6 months is maximum to use comfortably. Stirring with palette-knife or spatula is recommended before using.

### 2. Substrate...

Properties are normally applicable on 96% alumina substrates (standard IC grade) and LTCC. There is the possibility that similar results can not be achieved with a substrate of different manufacturer. Bend, surface roughness or cleanliness of substrate effectively influences paste performances. If other substrate will be used with, please ask us about compatibility.

### 3. Viscosity and Adjustment...

Brookfield viscometer type HBT with spindle SC4-14 and chamber 6R is mainly used in the catalogue. Viscosity and rheology have much effect on screen printability, severe control is recommended. Viscosity measurement is recommended to use comfortably after long storage period. Recommended solvents for each product is needed to adjust viscosity, Mix paste and proper amount of solvent gently and make them uniform. Proper size of pallet-knife or spatula is recommended for the mixing operation.

### 4. Screen Printing...

C.W. Price and Presco Printer and mesh number between 200 and 400 of stainless screen are mainly used in TTK. Controlling emulsion thickness, stencil, print pressure, snap-off distance, squeegee speed and angle are important to get correct thickness and fine line printability.

### 5. Leveling and Drying...

Leveling time for 5~10min. in room temperature is recommended to avoid remaining mesh-mark of screen.

Drying about 120°C for 10~15min. is recommended after leveling..

### 6. Firing...

Belt furnaces are recommended for firing, some cautions are indicated as follows,

\*Halogen solvent has effect on performance of fired film, pay attention not to enter vapors into furnace.

\*Set up the air entrance for proper gotten fresh air in flow.

\*Oil free dry pump with air filter needed to supply air into furnace

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