

## HAKKO FS-100 Chemical Paste

**HAKKO CORPORATION**

### 1. Components

Metallic powder particle: Flux mixture

- (1) Metallic powder particle: Pure tin approx. 40 $\mu$ m
- (2) Flux

Chemical name	Alicyclic amine hydrobromic acid	Aliphatic amine hydrobromic acid	Vaseline	Wax
Content	5 to 10	1 to 5	55 to 65	25 to 35
Chemical formula	RNH <sub>2</sub> •HBr	RNH <sub>2</sub> •HBr	C <sub>A</sub> H <sub>B</sub>	C <sub>n</sub> H <sub>2n+2</sub>
Official gazettes reference No.	1-264		9-1693	
CAS No.			8009-03-8	8002-74-2
UN Class	N/A	N/A	N/A	N/A
UN No.				

- (3) Metallic powder particle, flux mixture ratio (weight-based ratio) 50:50

### 2. Use method

- (1) Remove an oxide layer on the tip using chemical paste.
- (2) Wipe solder using a cleaning sponge and remove flux component.
- (3) Feed rosin-cored solder that is currently being used and wipe off solder again to use.



### 3. Cautions during use

- Chemical paste is a cleansing agent exclusive for a tip. Accordingly, it is impossible to use it directly at a place to be soldered.
- Chemical paste does not contain ammonium phosphate at all and is not harmful to the tip, worker or environment.  
Chemical paste is also excellent in its cleaning effect.
- Cautions
  - (1) When chemical paste is used, be sure to perform soldering work after wiping off the flux component on the tip with a cleaning wire 599B or sponge. It is recommended to clean twice or more.
  - (2) Seal the container after use and store it.
- Expiration date: 12 months (unopened)  
Use it as earlier as possible after opening.
- Reference for replacement: Replace it as soon as effect is lost.

### 4. Corrosion test

Purpose:	Check influence on the P.W.B. which was soldered with chemical paste stuck on the tip.
Test method:	Prepare a test sample according to the following procedures and leave it at constant temperature and humidity specified by JIS-Z-3197, and then observe flux residue on the test sample and copper discoloration condition using a microscope.
Material preparation:	<ol style="list-style-type: none"> <li>1) Test plate Cut a phosphorous-deoxidized copper plate specified by JIS H3100 in dimensions of 50 × 50 × 0.3mm. Soak it in 5%HCL for 2 minutes, rinse it with water and dry it with acetone.</li> <li>2) Test sample preparation Using a thermally-controlled soldering iron held at the predetermined temperature, touch the tip on the test plate perpendicularly and attach FS-100 to the test plate. Release the tip from the test piece and leave it for the predetermined time. Let the same tip come in contact with the test plate quickly and supply rosin-cored solder to prepare a test sample.</li> </ol>
Test conditions:	Constant-temperature/humidity bath: Temperature 40±2C°, humidity 90% Humidification time: 72 hours Tip temperature: 300C°, 350C°, 400C° Shelf test time: 10 sec, 30 sec, 60 sec

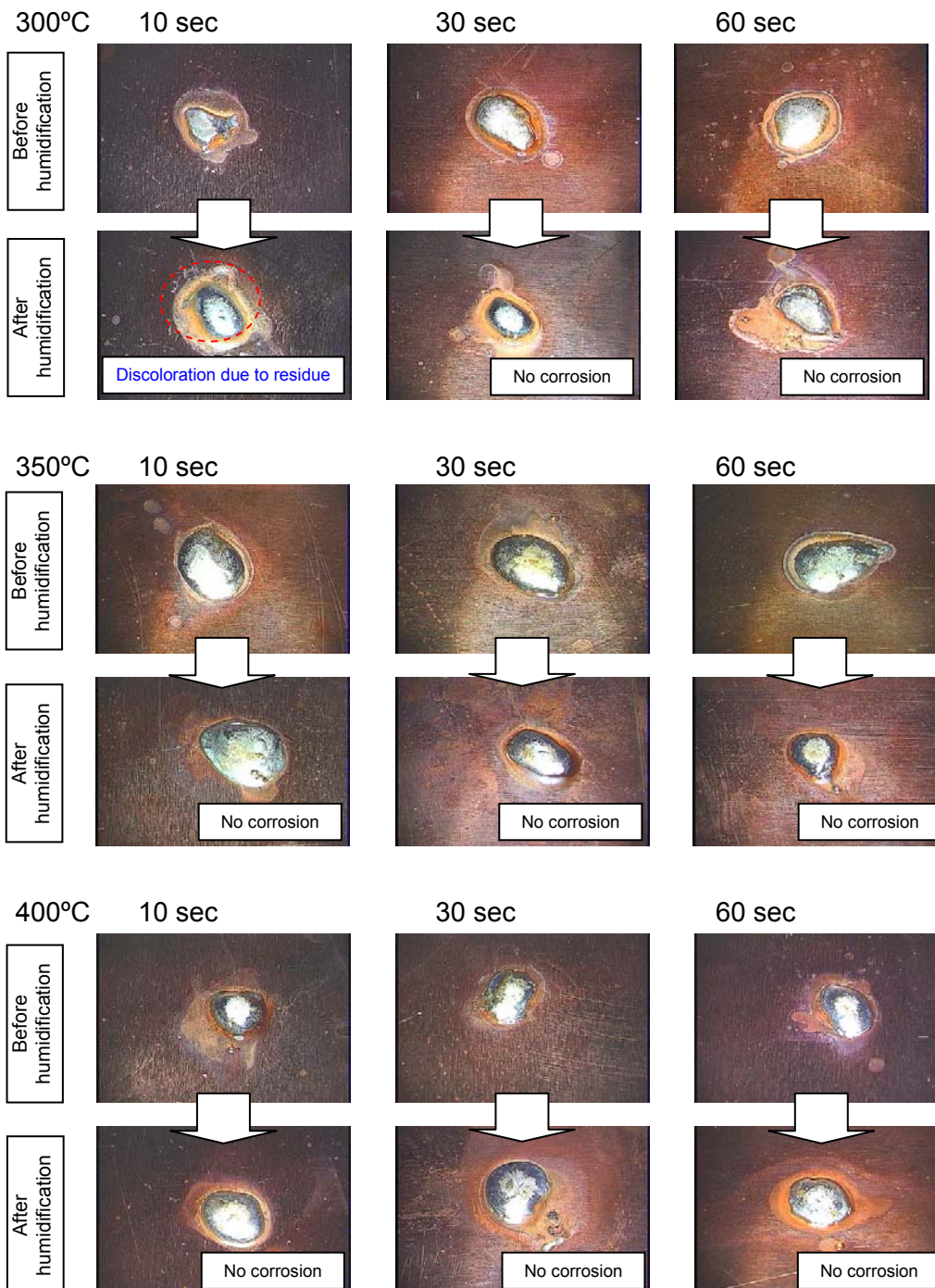
### Constant-temperature/humidity test:

Put the test sample into a constant-temperature/humidity bath with temperature and relative humidity set to  $40\pm 2^{\circ}\text{C}$  and 95% respectively and humidify and leave it for 96 hours continuously.

### Evaluation method:

Close up the test sample and observe the flux residue and discoloration condition of the copper face before/after humidification using a microscope to judge whether or not discoloration is generated.

### Test results (photo)



## Test results

Tip temperature	Shelf life time		
	10 sec	30 sec	60 sec
300°C	Discoloration due to residue	No corrosion	No corrosion
350°C	No corrosion	No corrosion	No corrosion
400°C	No corrosion	No corrosion	No corrosion

## Comment

As a result of the constant-temperature/humidity test, it was observed that discoloration was generated when the tip temperature was set to 300°C and time until soldering was set to 10 sec. In other conditions, discoloration was not observed; however, since chemical paste has much more active material than flux of thread solder, it was confirmed that corrosion is generated depending on use conditions.

**5. Effect after cleaning the tip**

Purpose: After removing the oxide layer on the tip using chemical paste, check the P.W.B. that underwent soldering using a cleaned tip for discoloration.

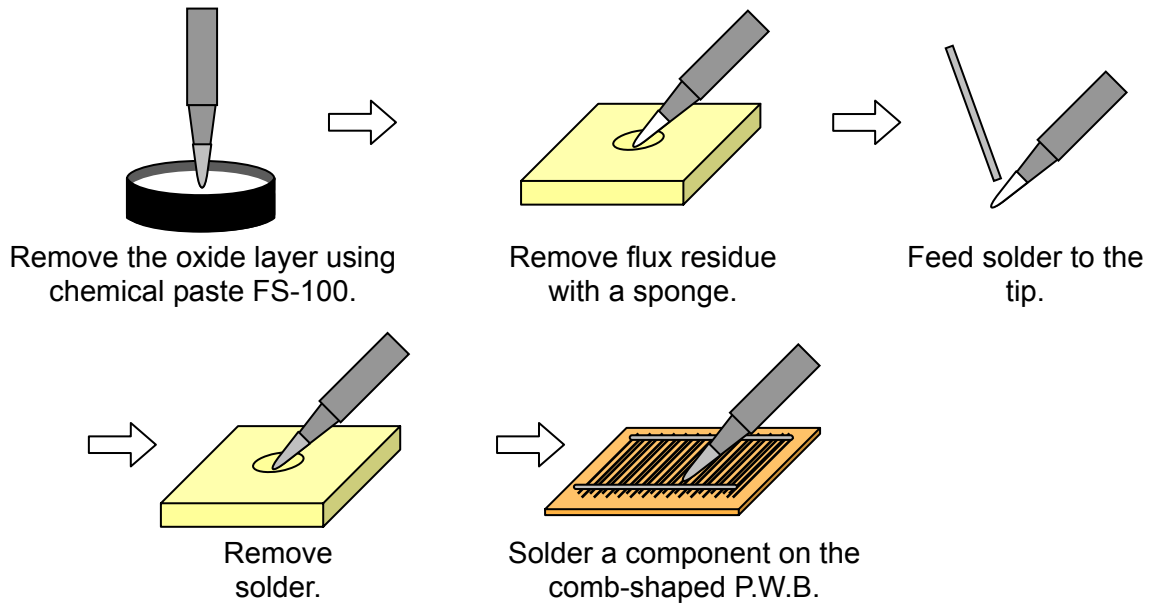
Test details: Insulation resistance test (JIS Z 3197)

**5.1 Insulation resistance test condition**

Temperature: 85°C  
Humidity: 85%RH  
Test time: Measure insulation resistance at 100V DC every 1 hour for 168 hours with the test piece in a constant temperature/humidity bath.

**5.2 Sample preparation procedures**

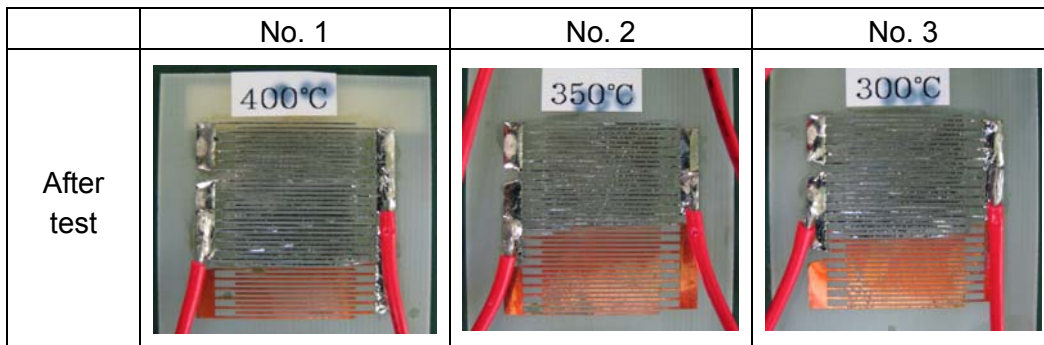
- (1) Perform pretreatment of comb-shaped P.W.B. according to the JIS Z 3197 procedures.
- (2) Remove the oxide layer on the tip used for the test using chemical paste FS-100.
- (3) Solder a component on the comb-shaped P.W.B.
- (4) Solder the lead wire to both ends of P.W.B. patterns.



### 5-3 Test results

Tip temperature (°C)	Initial resistance (Ω)		Resistance after 168 hours (Ω)	
	Room temperature	During humidification	During humidification	Room temperature
400	$3.3 \times 10^{11}$	$3.1 \times 10^9$	$8.5 \times 10^9$	$1.0 \times 10^{12}$
350	$1.0 \times 10^{12}$	$6.2 \times 10^{10}$	$2.1 \times 10^9$	$5.0 \times 10^{11}$
300	$5.0 \times 10^{11}$	$8.9 \times 10^9$	$2.5 \times 10^9$	$1.0 \times 10^{12}$
Average	$6.1 \times 10^{11}$	$2.5 \times 10^{10}$	$4.4 \times 10^9$	$8.3 \times 10^{11}$

### Sample photo



### Test results

After the test, no visual change in product, corrosion or the like was observed. The electric resistance was also within an acceptable range.

## 6. Conclusions

Chemical paste can remove an oxide layer on a tip and recover wetting property with solder. Used flux contains bromine-based organic halide as an activator.

Bromine-based organic halide evaporates at the tip use temperature; therefore, it is unlikely to be left at the root of soldered portion. However, in case of soldering an electric P.W.B. focusing on reliability, it is preferable that flux component of chemical paste does not remain; therefore, it is strongly recommended to clean the tip sufficiently and then perform soldering work after use.

Established on May 16, 2005

Revised on March 6, 2008