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TF-47001E-1
Revised on June 16, 2016

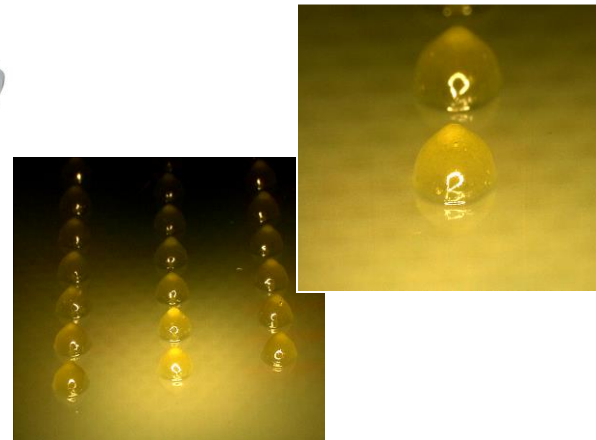
Koki no-clean LEAD FREE tack flux

Contents

- Features
- Specifications
- Halogen content
- Tack time
- Solder spreading
- Copper mirror
- Copper plate corrosion
- Voltage applied SIR
- Electromigration
- Extracted water resistivity
- Handling guide

Halogen FREE tack flux
TF-M880R

Product information



This Product Information contains product performance assessed strictly according to our own test procedures and may not be compatible with results at end-users.

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CHALLENGING NEW TECHNOLOGIES

Product features

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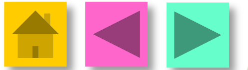

- Designed for BGA / CSP reflow and repair applications
- Conforms to Halogen-free standard (Cl + Br: below1500ppm) EN-14582
- No clean / ROL0
- Ensures high post soldering reliability

Specifications

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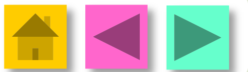
Application		Dispense
Product		**TF - M880R**
Halogen content*1		< 5 ppm
Acid value (mgKOH/g)		73 ± 7
Flux type*2		ROL0
Viscosity (Pa.S)*3		37.7 ± 3.8
Copper plate corrosion*4		Passed
Tack time		> 8 hours
Shelf life	0 - 10ºC	6 months
	Room temp. (25ºC)	3 months

1. Halogen content : BS EN 14582 (for Apple, Halogen free standard)
2. Flux type : According to IPC J-STD-004A
3. Viscosity : Malcom spiral type viscometer,PCU-205 at 25ºC 10rpm
4. Copper plate corrosion : In accordance with IPC J-STD-004A



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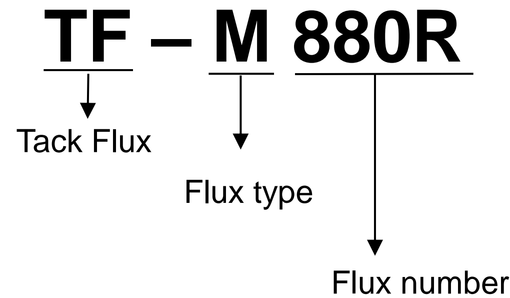
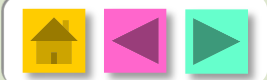
Specifications – Flux selections



Flux type	**M** : Low halide, halide free
Flux number	Solids and solvents used



Halogen content

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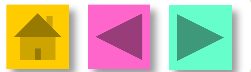


・Test method : A: IPC-TM650 2.3.28.1
B: BS EN14582

・ Measurement instrument: ICS-1500 (DIONEX)
AQF-100（MITSUBISHI CHEMICAL ANALYTECH）

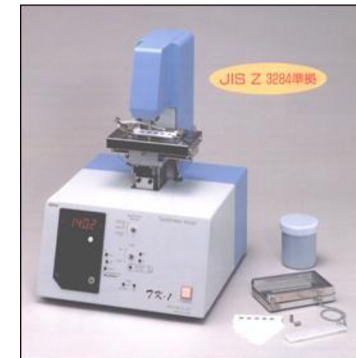
Halogen content (wt%)

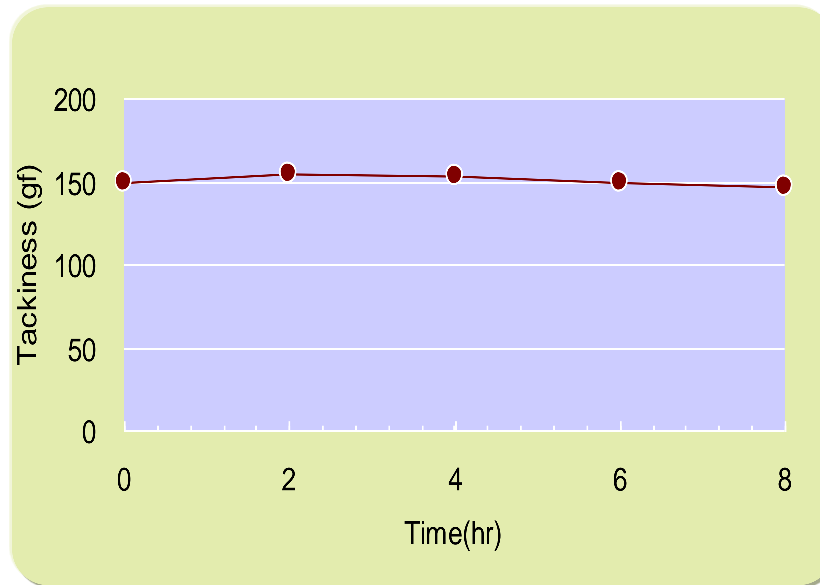
Method	A	B
Cl	ND	ND
Br	ND	ND

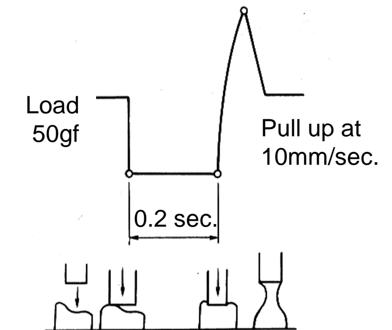
*ND : < 5 ppm

Tack time

- Stencil : 0.2mm (8 mils) thick, 0.6mm dia. aperture
- Measurement instrument : Malcom tackimeter TK-1
- Probe pressure : 50gs
- Pressurizing time : 0.2mm
- Pull speed : 10mm/sec.
- Test method : In accordance with JIS Z 3284
- Test environment : 25+/-1°C, 60+/-10%RH







Unique solvent system successfully assures sufficient tack time.

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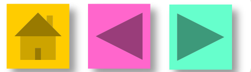

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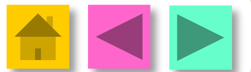

Solder spreading

Solder : Sn96.5, Ag3.0, Cu0.5

Test plate : phosphor deoxidized copper plate (specified in JIS-H-3100) 0.3×50×50mm polished by #600 abrasive paper with alcohol dropped and washed by alcohol.

Test method : JIS Z 3197

Place the solder powder on the test plate, and drop 0.05g of the flux. Then, heat it at 250±5ºC on the solder bath and melt it for about 30 sec. After reaching the said temperature, spread the solder over the plate.

After cooling it at ordinary temperature, remove the residual flux with alcohol, and measure the height of solder by a hygrometer and calculate the rate of spread from the following formula :

$$S = \frac{D - H}{D} \times 100$$

S : Rate of solder spreading (%)
H : Height of spread solder (mm)
D : Diameter when the solder used is assumed to be as a sphere (mm)

$D = 1.2407 \times$ (weight of solder/specific gravity of solder)

n	Rate of solder spreading (%)	
1	70.5	Average: 71.7
2	72.3	
3	71.3	
4	71.8	
5	72.7	

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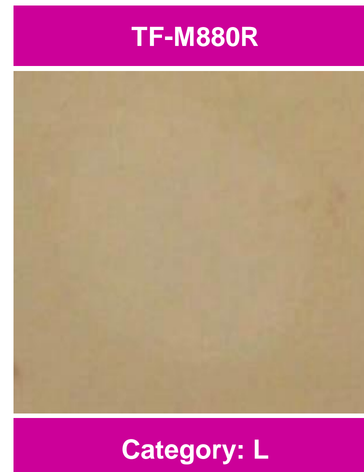
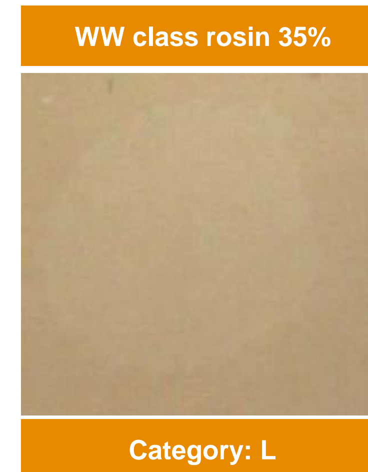
Copper mirror test

- Test conditions : 23±2ºC 50±5%RH for 24 hours
- Test method : IPC J-STD-004A

Definition

Category L : No evidence of mirror breakthrough.
Category M : Breakthrough in less than 50% of test area.
Category H : Breakthrough in more 50% of test area.

TF-M880R	WW class rosin 35%
	
Category: L	Category: L

Copper plate corrosion

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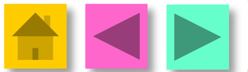
- Test conditions : 40±2ºC 90~95%RH for 240 hours
- Test method : IPC J-STD-004A

No evidence of corrosion can be observed.



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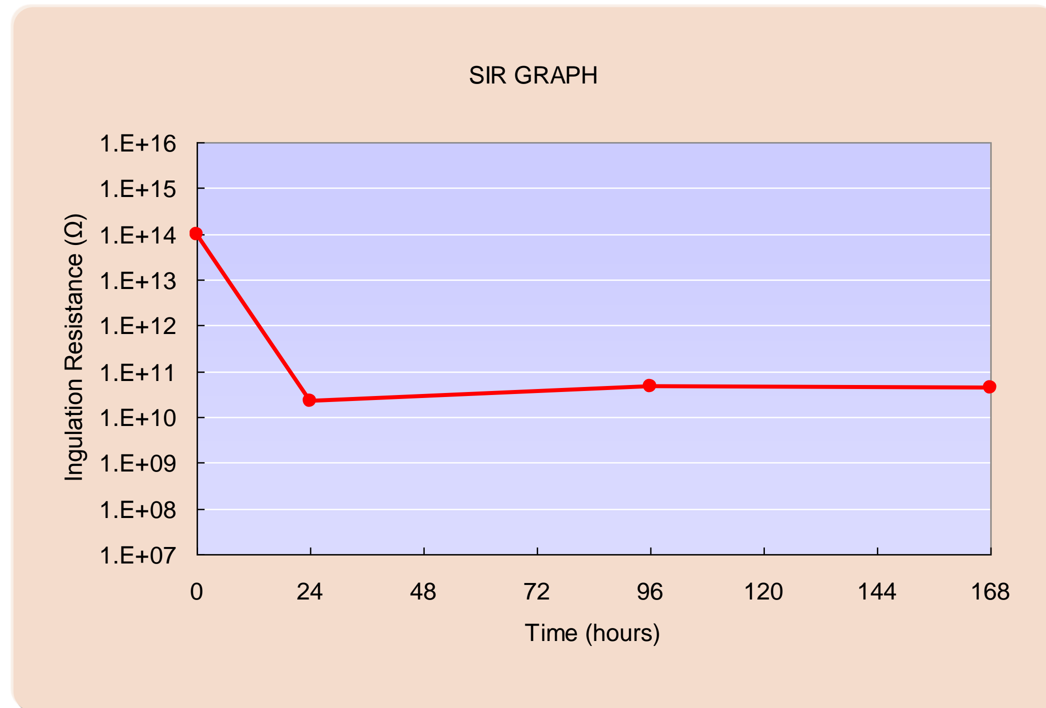
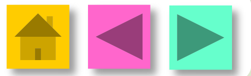
Voltage applied surface insulation resistance

- Test conditions : 85±2ºC × 85%RH for 168 hours
- Stencil thickness : 150 micron (6 mils)
- Comb type electrode : JIS type-II
- Measurement voltage : DC100V
- Voltage applied : DC 50V
- Test method : IPC J-STD-004A



No evidence of electromigration can be observed.



Electromigration

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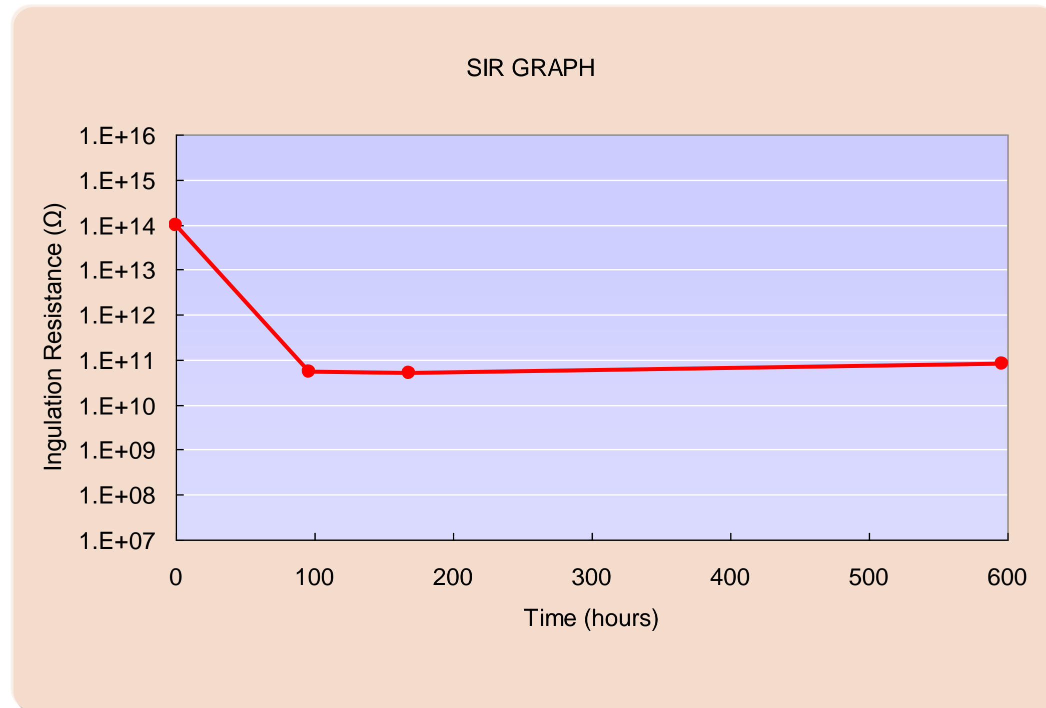
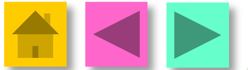
- Test conditions : 85±2ºC × 85%RH for 596 hours
- Stencil thickness : 150 micron (6 mils)
- Comb type electrode : JIS type-II
- Measurement voltage : DC100V
- Voltage applied : DC10V (96hours~)
- Test method : IPC J-STD-004A



No evidence of electromigration can be observed.



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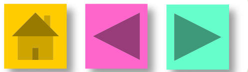

Extracted water resistivity

Test method :

Extract the flux in purified water and carry out the test on water soluble conductive components in the flux measuring the conductivity of the extracted water at 20°C.

Take an amount of 0.1ml flux as the sample into a cleaned and dried 50ml beaker.

Put the sample in the beaker with 50ml of purified water, then cover the beaker with a watch glass, heat and boil it for about 5 minutes, and further continue heating for about 1 minute. Cool the beaker for about 10 seconds at room temperature, put it in a water bath at about 20°C to obtain the test solution, and immediately measure the resistivity of this water solution with a conductivity meter.

The cell of 0.1 cell constant shall be used.

The purified water to use shall have more than $5\times10^3\Omega\cdot m$ of specific resistance.

The test shall be made 3 times and take the mean value.

n	Resistivity of water extract	(Ω• m)
1	4.3×10^3	Average: 4.5×10^3 ($4.5\times10^5\ \Omega\cdot cm$)
2	4.4×10^3	
3	4.7×10^3	

* Blank sample (water) : $8.4\times10^3\ \Omega\cdot m$

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Handling guide - Recommended reflow profile

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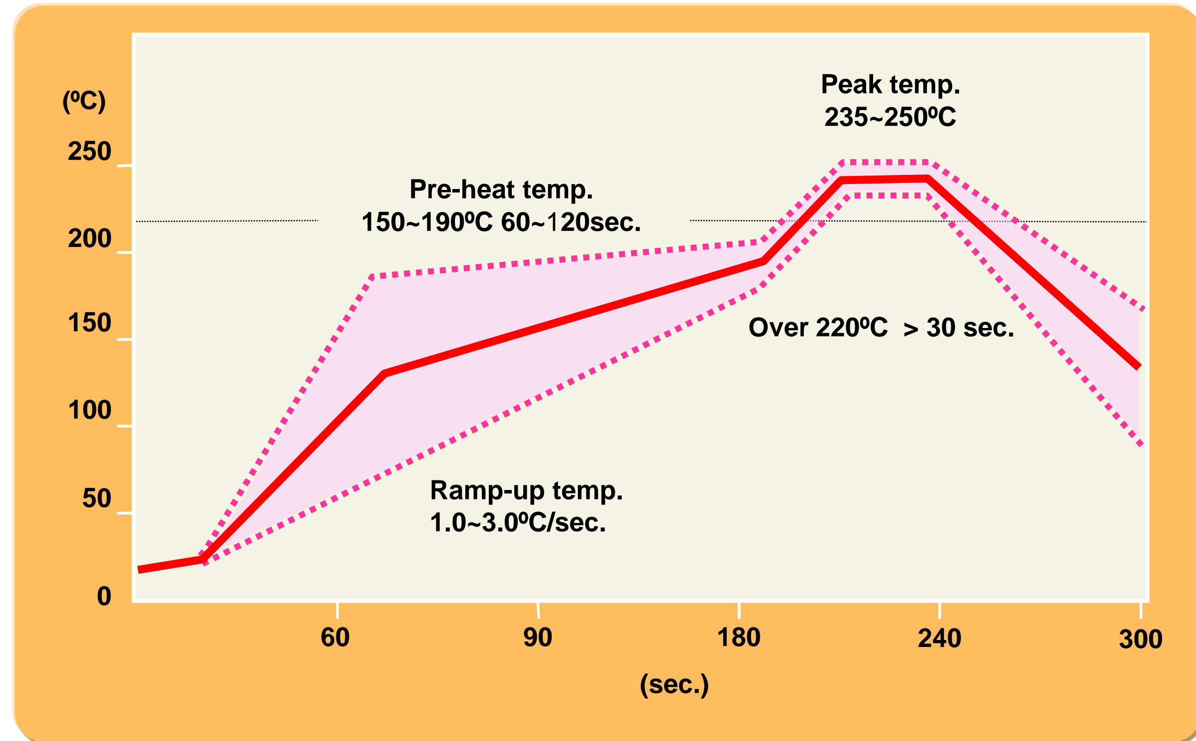

Excess pre-heating (time & temperature) may cause too much oxidation.

Relatively short and low pre-heat may be recommendable, especially for fine pitch/micro pattern components .