

## NihonHanda 153 Solder Paste

Reduce Head in Pillow, No-Clean, Lead-Free, Halide-Free, ROL0 & Air Reflow Capable Solder Paste

### DESCRIPTION

153 flux is developed to solve head in pirrow defect. The solder paste with 153 has excellent printability and solubility (not only air reflow but also N<sub>2</sub> reflow) required for BGA package. This solder paste is superior to suppress the slump and solder bridge. Accordingly this solder paste is suited to surface mount whichi is required high-density packaging.

### FEATURES & BENEFITS

- Excellent printability and fine solubility required for BGA package
- Excellent solubility even in micron area such as 0.12T x 0.2Φmm at air reflow
- High printability available with micro chip components such as QFP in 0.4mm pitch
- Environmentally-friendly halogen free, which is ROL0 in IPC standard
- Features high tack force such as 1.0N or more at 24 hours after printing
- No solder bridges and no solder balls
- Less high reliability flux avilable non-cleaning
- High preservation stability without quality degradation for 6 months stored at 0 to 15 deg.C

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### PRODUCT INFORMATION

Alloys : PF305 : Sn-3.0Ag-0.5Cu  
 Powder size : Type 4 (20~38μm)  
 Packaging Sizes : 500 gram jars  
 Lead Free : Complies with RoHS Directive 2011/65/EU

NOTE : For other powder size and packaging sizes, contact our office.

### SAFETY

While the NihonHanda 153 flux system is not considered toxic, its use in typical reflow will generate a small amount of reaction and decomposition vapors.

These vapors should be adequately exhausted from the work area.

Consult the SDS for additional safety information.

### HALOGEN STATUS

| Halogen Status                                              |                                                                                                            |             |        |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------|--------|
| Standard                                                    | Requirement                                                                                                | Test method | Status |
| IEC 612249-2-21                                             | Post Soldering Residues contain < 900 ppm each or total of < 1500 ppm Br or Cl from flame retardant source | TM EN 14582 | Pass   |
| JEDEC<br>A Guideline for Defining "Low Halogen" Electronics | Post soldering residues contain < 1000 ppm Br or Cl from flame retardant source                            |             | Pass   |

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### TECHINCAL DATA

| CATEGORY                                                  | RESULTS                                   | PROCEDURES/REMARKS        |
|-----------------------------------------------------------|-------------------------------------------|---------------------------|
| <b>CHEMICAL PROPERTIES</b>                                |                                           |                           |
| Activity Level                                            | ROL0                                      | IPC J-STD-004B            |
| Halide Content                                            | 0.02%                                     | JIS Z 3197_2021 8.1.4.2.1 |
| Fluoride Spot Test                                        | Pass                                      | JIS Z 3197_2021 8.1.4.2.4 |
| Silver Chromate Paper Test                                | Pass                                      | JIS Z 3197_2021 8.1.4.2.3 |
| Copper Mirror Corrosion Test                              | Pass                                      | JIS Z 3197_2021 8.4.2     |
| Copper Plate Corrosion Test                               | Pass                                      | JIS Z 3197_2021 8.4.1     |
| <b>ELECTRICAL PROPERTIES</b>                              |                                           |                           |
| SIR : 40 deg.C 90%RH                                      | 100GΩ or more                             | JIS Z 3197_2021 8.5.3     |
| SIR : 85 deg.C 85%RH                                      | 5GΩ or more                               | JIS Z 3197_2021 8.5.3     |
| JIS Electrto migration<br>(1000 hours@85 deg.C 85%RH 45V) | No migration                              | JIS Z 3197_2021 8.5.4     |
| <b>PHYSICAL PROPERTIES</b>                                |                                           |                           |
| Flux Content                                              | 11.5%                                     | JIS Z 3197_2021 8.1.2     |
| Viscosity                                                 | 200 Pa · s                                | JIS Z 3284-3_2014 4.2     |
| Color                                                     | Clear, Colorless Flux Residue             | —                         |
| Tack Force                                                | 1.0N or more at 24hours<br>after printing | JIS Z 3284-3_2014 4.5     |
| Solder Ball                                               | Class 1~2                                 | JIS Z 3284-4_2014 4.2     |
| Spread                                                    | 75% or more                               | JIS Z 3197_2021 8.3.1.1   |
| Cold/Printing Slump                                       | No bridge for<br>0.3 mm space             | JIS Z 3284-3_2014 4.3     |
| Hot Slump                                                 | No bridge for<br>0.3 mm space             | JIS Z 3284-3_2014 4.3     |

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### PROCESSING GUIDELINES

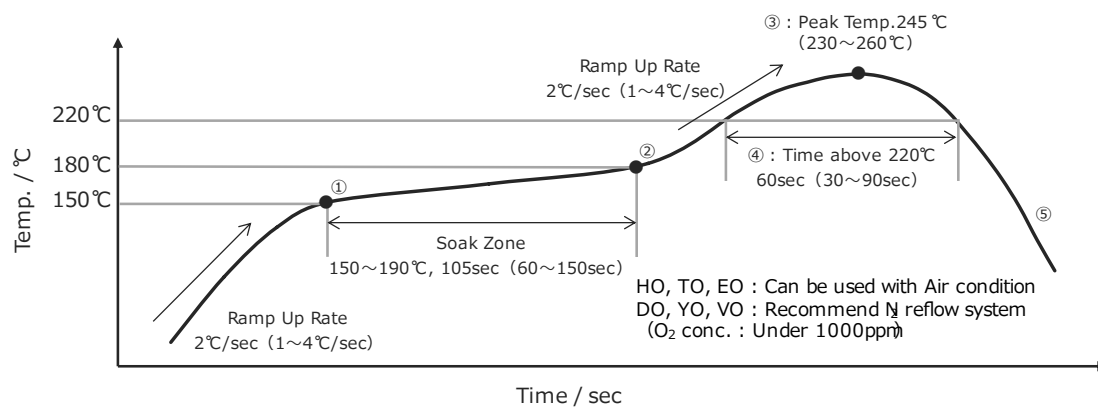
| STORAGE & HANDLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PRINTING                                                                                                                                                                                                                                                                                                                                                                                                                               | REFLOW (Refer to Fig.1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CLEANING                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. Refrigerate to guarantee stability@ 0-15 deg.C. When stored under these conditions, the shelf life of PF305-153TO is 6 months.</p> <p>2. Please open the lid after the temperature of the paste completely becomes same as the room temperature. It usually takes one hour after taking out the product from a refrigerator. If you open the lid while the paste is still cold, dew will condense on the surface of the solder paste and it will cause the quality deterioration.</p> <p>3. Please avoid the intentional warming as much as possible. In case you force to warm the paste, please be careful enough not to raise the temperature too high. If it is above the room temperature, it causes inferior quality.</p> <p>4. The viscosity of solder paste changes according to the temperature. The higher the temperature is, the lower becomes the viscosity. So please use the paste under the specific condition of temperature. Meanwhile, please be careful that the paste absorbs moisture and becomes likely to deteriorate when the humidity is high. As for usage circumstances, we recommend conditions of 25±3 deg.C and humidity of 70% RH or lower.</p> | <p>● Stencil:<br/>Recommend to use metal masks processed with additive or laser manufacturing.<br/>0.1 to 0.15mm mask thickness is adequate for printing 0.4 to 0.5mm pitch.</p> <p>● Squeegee:<br/>Recommend to use metal squeegee.</p> <p>● Printing pressure:<br/>0.1 to 0.3N/mm is recommended.</p> <p>● Printing speed:<br/>20 to 80mm/sec is recommended.</p> <p>● Plate releasing speed:<br/>0.1 to 5mm/sec is recommended.</p> | <p>Reflow atmosphere:<br/>Both air and N<sub>2</sub> reflow are available. 1000ppm or less is recommended for oxygen concentration.</p> <p>Profile:</p> <p>● Please set ramp rate at 1 to 4 deg.C/sec. till preheating area.</p> <p>● Recommend 150 to 190 deg.C for 60 to 150 seconds for preheating. Inappropriate preheating conditions cause insufficient soldering.</p> <p>● Please take 30 to 90 seconds at 220 deg.C or more. The longest time is more recommended to avoid void occurrence.</p> <p>● Peak temperature is recommended for 230 to 260 deg.C. Higher temperature is generally recommended so far as surrounding components can be endured.</p> | <p>● For the appropriate detergents for flux residues, please inquire to Tecnolab.</p> <p>● Please wash out solder paste with isopropyl alcohol from stencils or squeegees.</p> |

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### RECOMMENDED HEATING REFLOW PROFILE

#### Recommended Heating Reflow Profile



| Category |                       | Lower Limit | Recommend | Upper Limit |
|----------|-----------------------|-------------|-----------|-------------|
| ～①       | Ramp Up Rate          | 1℃/sec      | 2℃/sec    | 4℃/sec      |
| ①        | Soak Zone Start Temp. | 140℃        | 150℃      | 160℃        |
| ②        | Soak Zone End Temp.   | 180℃        | 190℃      | 200℃        |
| ①～②      | ①－② Section time      | 60sec       | 105sec    | 150sec      |
| ②～③      | Ramp Up Rate          | 1℃/sec      | 2℃/sec    | 4℃/sec      |
| ③        | Peak Temp.            | 230℃        | 245℃      | 260℃        |
| ④        | Time above 220℃       | 30sec       | 60sec     | 90sec       |
| ⑤        | Cooling Rate          | 2℃/sec      | —         | —           |

Fig.1 Recommended Heating Reflow Profile

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### CONTACT INFORMATION

To confirm this is the most recent issue, please contact NihonHanda.

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