

ECOREL™ FREE 305-16



Low voiding/ robust assembly Halogen free solder paste

FEATURES

ECOREL™ FREE 305-16 is a No clean lead-free solder paste developed with the reliable chemistry of the Ecorel™ range helping to assure a robust assembly process for high volume electronics and complex boards.

- Low solder void percentage
- Excellent visual solder joint cosmetics/ transparent residues even after multiple reflow cycles
- High first pass yield testability in ICT
- Very good wetting in different board finishes including OSP.

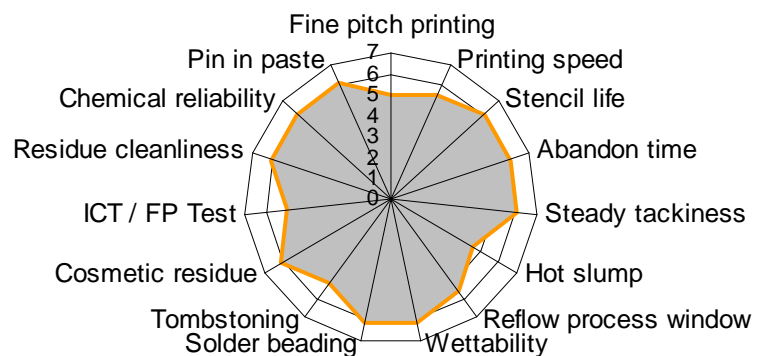
SPECIFICATIONS

| | |
|--|-------------------------|
| Alloy (available with others Ag content) | SnAg3Cu0.5 |
| Powder size distribution (microns) | 25 – 45 |
| Melting point (°C) | 217 |
| Metal content (%) | 88 +/- 0.5 |
| Halogen content | No halogen |
| Viscosity* (Pa.s 20°C) *Brookfield RVT - TF at 5 rpm. | 750 – 950 |
| Post reflow residues | Approximately 5% by w/w |

CHARACTERISTICS

The radar chart below shows the excellent printing capabilities of **ECOREL™ FREE 305-16** which allows for high speed printing, excellent abandon time, and long, steady tackiness. Its large process window allows for good soldering of medium and large boards with a wide range of component sizes.

- Stencil life: more than 12 hr – continuous printing process
- Steady tackiness: more than 16 hr
- Abandon time: more than 4 hr – time between 2 prints with good restart (0.4mm pitch)



| FUNCTIONAL TESTS | Results | Procedures |
|------------------------------------|-------------|----------------|
| Flux Classification | ROLO | ANSI/J-STD-004 |
| | 113 | ISO 9454 |
| Solder balling test | pass | ANSI/J-STD-005 |
| Copper mirror | pass | ANSI/J-STD-004 |
| Chromate paper | pass | ANSI/J-STD-004 |
| Copper corrosion | pass | ANSI/J-STD-004 |
| Surface Insulation Resistance Ohms | pass | ANSI/J-STD-004 |
| After 7 days | | |
| 85°C - 85 % RH - 50 Volts | $> 10^{10}$ | |
| 25°C - 65 % RH | $> 10^{12}$ | |

PACKAGING TYPE

| | |
|-------------------|-----------------|
| Jars | 250 g or 500 g |
| Cartridges | 600 g or 1200 g |
| Proflow cassettes | |

STORAGE & SHELF LIFE

To ensure the best product performance, the recommended storage temperature range is from 5°C to 10°C. A shelf life of 12 months is achieved under these conditions. For cartridges, the shelf life is 9 months. For an optimal preservation, store cartridges in vertical position, tip downwards.

PROCESS PARAMETERS

Solder paste preparation

Before printing, it is essential to properly mix the solder paste, either manually with a spatula, or by doing several preliminary prints on the stencil.

Printing guideline

Apply on the stencil solder paste to form a roll of 1 to 2 cm of diameter all along the squeegee. This way, the solder paste will roll easily under the squeegees to offer excellent printing quality.

| | |
|-----------------|---------------------------|
| Printing speed: | 20 to 150 mm/sec. |
| Minimum pitch: | 0.3 mm |
| Pressure | depends on printing speed |

| Squeegee length | Printing Speed | Pressure |
|-----------------|----------------|----------|
| 250 | 50 mm/sec | 4 Kg |
| 250 | 100 mm/sec | 6 Kg |
| 250 | 150 mm/sec | 8 Kg |

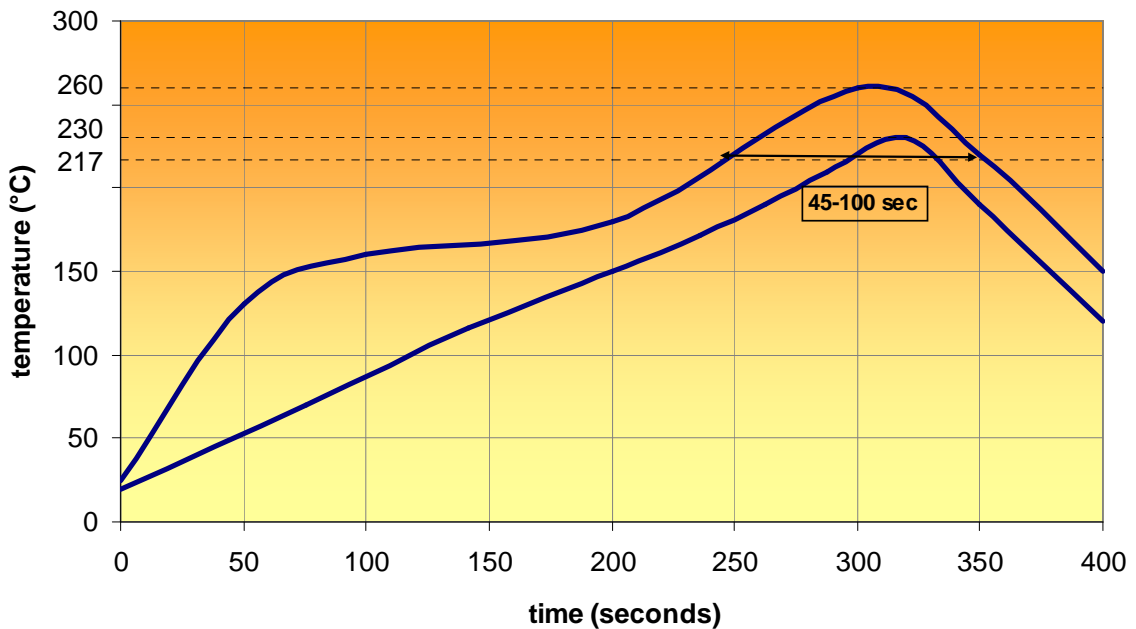
Reflow guideline

A linear preheating ramp rate is recommended. But a high density board may require a soak zone during preheating to stabilize the temperature over the circuit board before peak reflow.

| | |
|---|--|
| Preheating ramp rate with linear preheating | 0.7 to 1.2°C/s according the circuit board size and density |
| Preheating steps in case of preheating soak zone | - From 20 to 150°C: ramp rate 1 to 2°C/s - soak zone between 150 to 180°C for 60 to 140s - from 170°C to liquidus 1 to 2°C/s |
| Peak ramp rate | 1 to 2°C/s |
| Peak temperature | 235 to 250°C (240 to 245°C is optimum) The paste can stand a temperature higher than 250°C, but it is not recommended in order to preserve component integrity. |
| Time above liquidus | 45 to 100s (55 to 70s typical) |
| Cooling ramp rate | 1.8 to 7°C/s (studies have demonstrated 1.8 to 2.2°C/s allows homogeneous joint structure and reduce surface cracks formation) |

Examples of reflow profiles Ecorel FREE 305-16

- with linear preheat
- with soak zone



Cleaning

ECOREL™ FREE 305-16 residue after reflow can be easily removed with a wide range of cleaning solutions, such as detergents, hydrocarbonated solvents or fluorinated solvents, including the INVENTEC cleaning solutions.

| PROCESS Type | INVENTEC PCBA Defluxing solutions |
|--|--|
| Manual | Topklean™ EL10F/ Topklean™ EL60/ Quicksolv™ DEF90 EL |
| Aqueous System (Immersion or spray) | Promoclean™ DISPER 605 and DISPER 607 |
| Novec™ HFE + Co-solvent | Topklean™ EL 20A and EL 20R |
| Under Vacuum System | Topklean™ EL 20D |
| Azeotropic Solvent | Promosolv™ 70ES |

HSE

No issues when used as recommended.

INVENTEC Material Safety Data sheets can be found at www.quickfds.com

Please refer to Material Safety Data Sheet before use.

Although the conformity to ROHS 2002/95CE applies to EQUIPMENT put on the market and not to a component in particular, we warranty that this product contains less than 0.1% of mercury, lead, chromium VI, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and less than 0.01% for the cadmium, in accordance with the decision of The European Commission dated 18/08/2005, fixing the maximal concentration values.

This data is based on information that the manufacturer believe to be reliable and offered in good faith. In no event will INVENTEC be responsible for special, incidental and consequential damages. The user is responsible to the Administrative Authorities (regulations for the protection of the Environment) for the conformity of his installation.

FPW.SB.10230 001 – 18/06/2013