

ECOREL™ FREE 305-16 305-16 T4



HALOGEN FREE SOLDER PASTE ROBUST ASSEMBLY

BENEFITS

ECOREL™ FREE 305-16 is a no clean, lead-free solder paste developed with the reliable chemistry of the **ECOREL™** range.

- Very good wetting on any surface finish including OSP and strong anti-graping properties
- Robust assembly process for high volume electronics and complex boards
- Outstanding first pass yield testability in ICT
- Transparent and colorless residue even after multiple reflow cycles
- Stable performance up to 31 days when stored at room temperature (30°C max)

SPECIFICATIONS

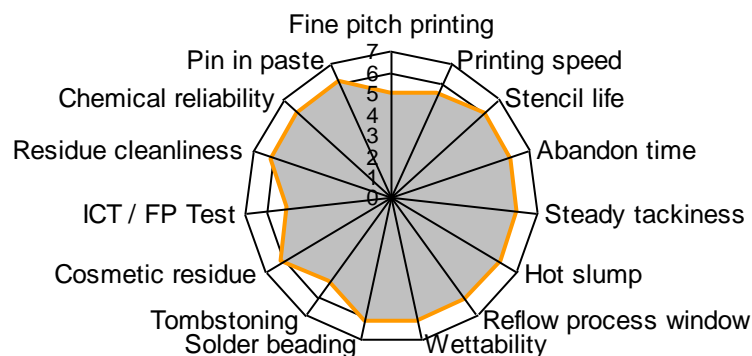
Name	Ecorel™ Free 305-16	Ecorel™ Free 305-16 T4
Alloy	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5
Particle size (microns) / Type	25 – 45 / Type 3	20 -38 / Type 4
Melting point (°C)	217	217
Metal content (%)	88 +/- 0.5	88 +/- 0.5
Halogen content	No Halogen	No Halogen
Viscosity* (Pa.s 20°C) <i>*Brookfield RVT - TF at 5 rpm</i>	750 – 950	800 - 1000
Post reflow residues	Approximately 5% by w/w	Approximately 5% by w/w

CHARACTERISTICS

ECOREL™ FREE 305-16 meets IPC-A-610 voids level (25%) requirement.

The radar chart below shows the excellent characteristics of **ECOREL™ FREE 305-16**, including high speed printing, excellent abandon time, and high pin in paste performance. Its large process window allows for good soldering of medium and large boards.

Fine particle size distribution of type 4 powder enhances the printing quality.



Standards 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
SIR (IPC)	pass	ANSI/J-STD-004
SIR (Bellcore)	pass	Bellcore
Electromigration (IPC / Bellcore)	pass	ANSI/J-STD-004 / Bellcore
Oxygen bomb test	pass	EN 14582

PROCESS PARAMETERS

Store at room temperature for at least four hours prior to use.

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 the solder paste to the stencil to form a roll of 1 to 2 cm in diameter all along the squeegee or around 100g per 10 cm of squeegee length. This way, the solder paste will roll easily under the squeegees to offer excellent printing quality.

Printing speed: 20 to 150 mm/s (1 to 6 in/s)
 Minimum pitch: 0.3mm
 Pressure: depends on printing speed and printing equipment

Typical speed / pressure set up:

Squeegee length	Printing Speed	Pressure Ecorel™ Free 305-16	Pressure Ecorel™ Free 305-16 T4
250	50 mm/s	3 kg	4 kg
	100 mm/s	5 kg	6 kg
	150 mm/s	7 kg	8 kg

- Stencil life in continuous printing process > 12hrs
- Abandon time between prints with > 4hrs
- Steady tackiness > 16hrs

Reflow guideline

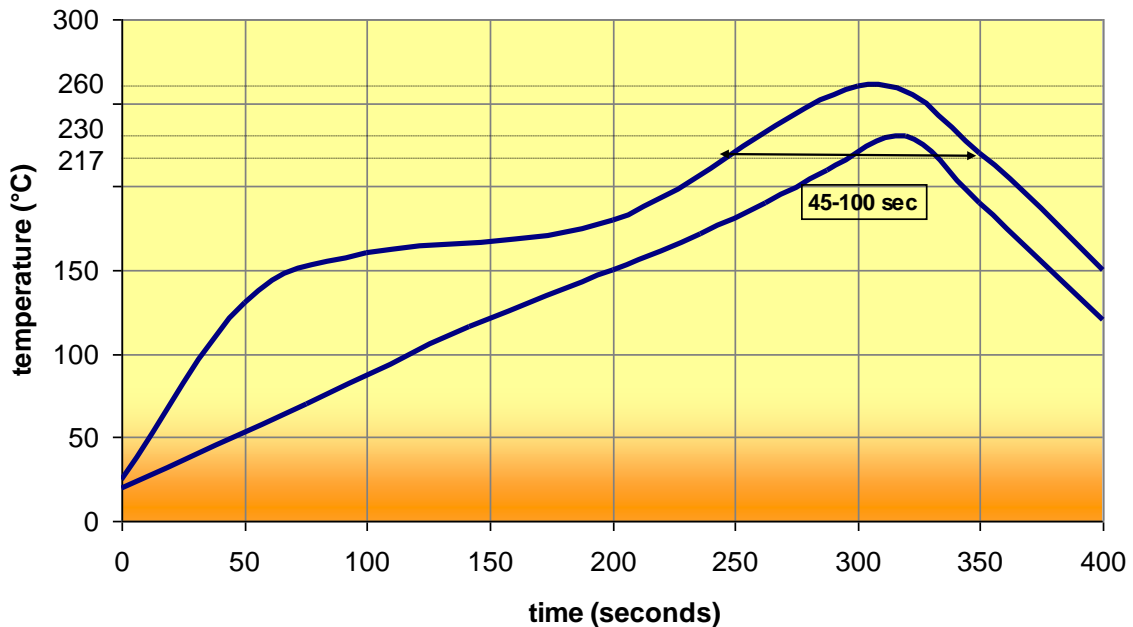
This paste can be processed under air or nitrogen.

Linear preheating ramp rate is recommended, however high density boards 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 to 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 reduces surface crack formations)

Examples of reflow profiles for Ecorel™ FREE 305-16

- With linear preheating
- With soak zone



Cleaning

After soldering, the remaining flux residue does not have to be removed by a cleaning operation as it is chemically inert.

When cleaning is required (e.g. high reliability assembly, improved conformal coating adhesion), the residue left after reflow can be easily removed with a large range of cleaning solutions, such as detergents, hydrocarbonated solvents or halogenated solvents, including the INVENTEC cleaning range solutions.

The table below is a quick reference for INVENTEC PCBA defluxing solutions.

ECOREL™ 305-16 shows excellent cleanability with detergent based cleaning process.

PROCESS Type	ECOREL™ FREE 305-16	INVENTEC PCBA Defluxing solutions
Manual	Good	Topklean™ EL10F/ Topklean™ EL60/ Quicksolv™ DEF90 EL
Aqueous system (Immersion or spray)	Preferred	Promoclean™ DISPER 605 and DISPER 607
Co-solvent system	Good	Topklean™ EL 20 series
Under vacuum system	Good	Topklean™ EL 20D
Mono-solvent (Azeotropic)	Good	Promosolv™ 70ES

PACKAGING, STORAGE & SHELF LIFE

To ensure the best product performance, the recommended storage temperature range is from 0°C to 10°C. For an optimal preservation, store cartridges in a vertical position, tip downwards.

		0 - 10°C	< 30°C
Jars	250g or 500g	12 months	31 days
Cartridges	600g or 1200g	9 months	31 days
Proflow cassettes	750g	9 months	31 days

HSE

No issues when used as recommended.

Please refer to the Safety Data Sheet prior to use.

INVENTEC Safety Data Sheets can be found at www.quickfds.com.

Although the conformity to ROHS 2011/65/UE applies to EQUIPMENT put on the market and not 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 cadmium, in accordance with the decision of The European Commission dated 18/08/2005, fixing the maximal concentration values.

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BRY-FP-310-v4 – 06/07/16-WEB