

ECOREL™ FREE 305-21 305-21 T4



HALOGEN FREE SOLDER PASTE HIGH RELIABILITY

BENEFITS

ECOREL™ FREE 305-21 is a No Clean lead free solder paste with high performance chemistry of the **ECOREL™** range assuring that the assembled electronics can reach their best reliability, while exposed to challenging humidity and temperature conditions.

- Chemically inert residue, minimizing the risk of corrosion mechanisms and leakage current
- Good compatibility with a large range of conformal coating in the market
- Bono corrosion test compliant

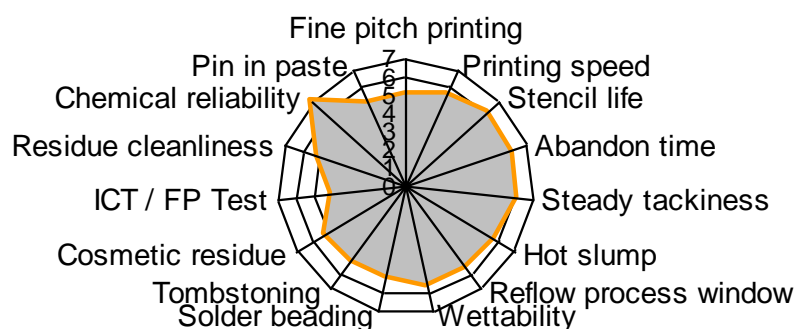
SPECIFICATIONS

Name	Ecorel™ Free 305-21	Ecorel™ Free 305-21 T4
Alloy	SnAg3Cu0.5	SnAg3Cu0.5
Particle size (microns) / Type	25 – 45 / Type 3	20 - 38 / Type 4
Melting point (°C)	217	217
Metal content (%)	88.5 ± 0.5	88.5 ± 0.5
Halogen content	No Halogen	No Halogen
Viscosity* (Pa.s 20°C) *Brookfield RVT - TF at 5 rpm	750 - 950	850 - 1050
Post reflow residues	Approximately 5% in weight	Approximately 5% in weight

CHARACTERISTICS

The radar chart below shows the excellent characteristics of **ECOREL™ FREE 305-21** including high speed printing, excellent abandon time and good pin in paste performance. During the reflow process, a low solder void percentage is achieved.

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
Bono Corrosion test 85°C / 85% HR – 15 days	Pass: FC=1.4%	INVENTEC BRY-MO-058

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 2cm in diameter all along the squeegee or around 100g per 10cm 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 6in/s)
 Minimum pitch: 0,3 mm
 Pressure depends on printing speed and printing equipment

Typical speed / pressure set up:

Squeegee length	Printing Speed	Pressure Ecorel™ Free 305-21	Pressure Ecorel™ Free 305-21 T4
250	50 mm/s	5 kg	6 kg
	100 mm/s	7 kg	8 kg
	150 mm/s	9 kg	10 kg

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

Reflow guideline

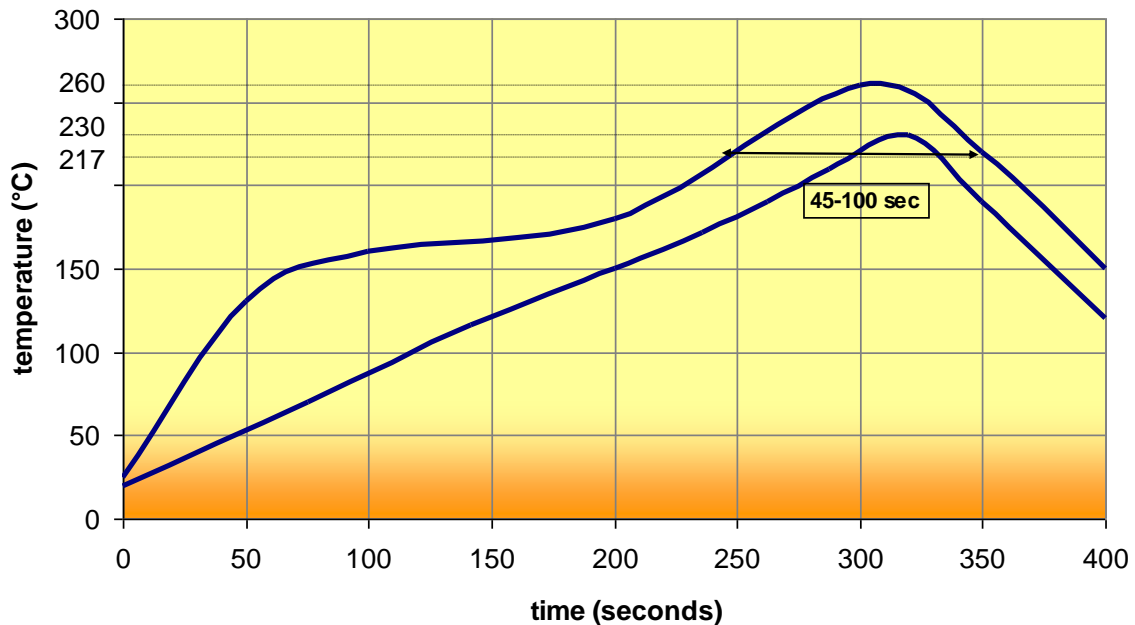
This paste can be processed under air or nitrogen.

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 305-21

- 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™ FREE 305-21 shows excellent cleanability with solvent based cleaning process.

PROCESS Type	ECOREL™ FREE 305-21	INVENTEC PCBA Defluxing solutions
Manual	Good	Topklean™ EL10F/ Topklean™ EL60/ Quicksolv™ DEF90 EL
Aqueous system (Immersion or spray)	Good	Promoclean™ DISPER 605 and DISPER 607
Co-solvent system	Preferred	Topklean™ EL 20 series
Under vacuum system	Good	Topklean™ EL 20D
Mono-solvent (Azeotropic)	Preferred	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 to 10°C
Jars	250g or 500g	12 months
Cartridges	600g or 1200g	9 months
Proflow cassettes	750g	9 months

HSE

No issues when used as recommended.

Please refer to the Material Safety Data Sheet priori to use.

INVENTEC Material 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.

This document and its content are provided "as is" without any express or implied warranty. In no event and under no circumstances, shall INVENTEC PERFORMANCE CHEMICALS be liable to any person or entities regarding the information provided, its accuracy, completeness or fitness to any business or specific use.

INVENTEC PERFORMANCE CHEMICALS represents that it fulfils its direct obligations under the REACH and Conflict Mineral regulations.

BRY-FP-331-v4-15/12/2016