ECOREL™ FREE 305-21

INVENTEC
PERFORMANCE CHEMICALS

High reliability, lead free solder paste
Halogen Free – Excellent solderability

FEATURES

ECOREL™ FREE 305-21 is a No-Clean solder paste developed to offer very good wettability on different lead-free finishes, including OSP. Its large reflow process window allows for good soldering of medium and large boards with a wide range of component sizes. Due to its outstanding organic properties, **ECOREL™ FREE 305-21** can withstand multiple reflow cycles and offers low voiding. The solder joint is very shiny without graping even on very small deposits.

The radar chart below shows the excellent printing capabilities of **ECOREL™ FREE 305-21** which allow for high speed printing, excellent abandon time, long steady tackiness and good pin in paste capability.

After soldering, the flux residues remaining on the PCB are chemically inert. **ECOREL™ FREE 305-21** passes the Bono corrosion test. This is a key attribute to control the risk for electrochemical migration especially in electronics exposed to humidity and temperature.

SPECIFICATIONS

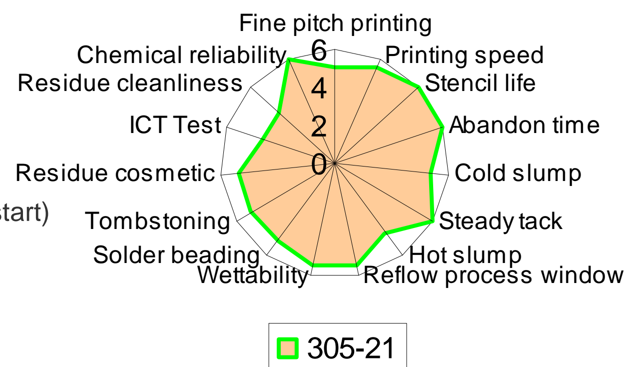
Alloy (available with others Ag content)	SnAg3Cu0.5
Powder size distribution (microns)	25 – 45
Melting point (℃)	217
Metal content (%)	88,5 ± 0,5
Halogen content	No Halogen
Viscosity* (Pa.s 20℃) **Brookfield RVT - TF at 5 rpm*	750 - 950
Post reflow residues	approximately 5% by w/w

CHARACTERISTICS

Stencil life >12 hours
(Paste life time in a continuous printing process)

Abandon time >4 hours
(for 0.4 mm pitch, 120 microns stencil)
(Maximum time between two prints with good print restart)

Steady tackiness >16 hours



FUNCTIONAL TESTS	Results	Procedures
Flux Classification	ROL0	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 After 7 days	pass	ANSI/J-STD-004
85℃ - 85 % RH - 50 Volts	> 10^{10} Ω	
25℃ - 65 % RH	> 10^{12} Ω	
Bono corrosion test 85℃ / 85% HR – 15 days	Pass: FC=1.4%	Inventec MO.SB10029

PACKAGING TYPE

Jars	250g or 500g
Cartridges	600g or 1200g
Proflow cassette	

STORAGE & SHELF LIFE

To ensure the best product performance, the recommended storage temperature range is from 5℃ to 10℃.
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	5 Kg
250	100 mm/sec	7 Kg
250	150 mm/sec	9 Kg

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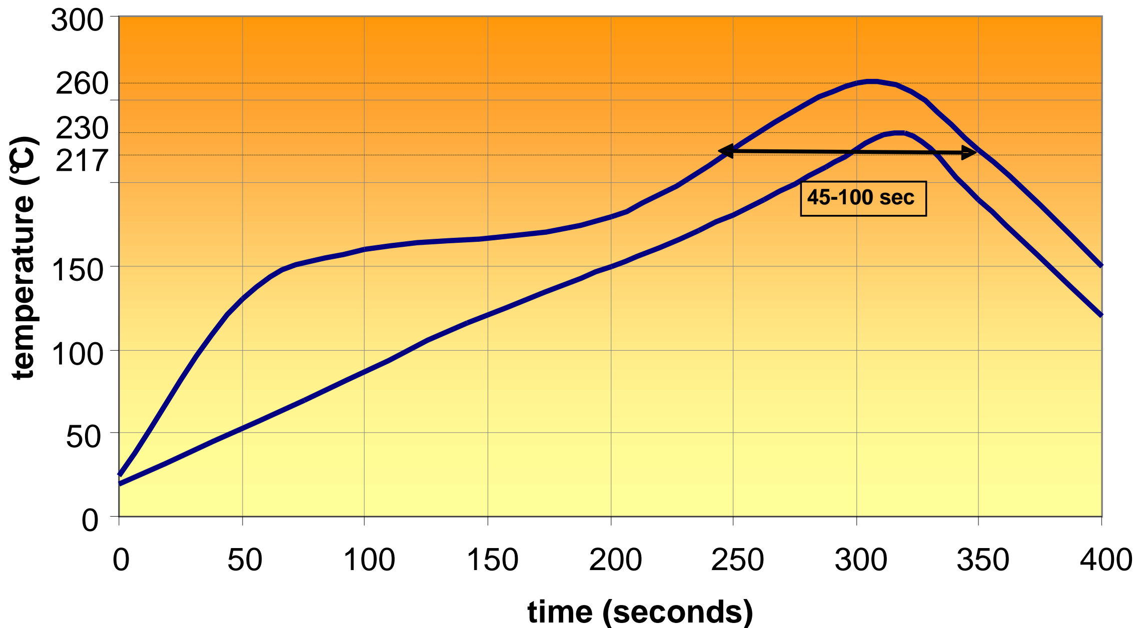
Reflow guideline

Linear preheating ramp rate is recommended. But 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	0.7-1.2℃/s according the circuit board size and de nsity
Preheating steps in case of preheating soak zone	- From 20 to 150℃: ramp rate 1-2℃/s - soak zone between 150-180℃ for 60 to 140s - from 170 to liquidus 1.0-2.0℃/s
Peak ramp rate	1.0-2.0 ℃/s
Peak temperature	235-250℃ (240-245℃ is optimum) The paste can stand a temperature higher than 250℃ , but it is not recommended in order to preserve component integrity.
Time above liquidus	45-100s (55-70s typical)
Cooling ramp rate	1.8-7℃/s (studies have demonstrated 1.8-2.2℃/s al lows homogeneous joint structure and reduce surface cracks formation)

Examples of reflow profiles ECOREL™ FREE 305-21

- With linear preheat
- With soak zone



Cleaning

After soldering, the flux residues remaining of **ECOREL™ FREE 305-21** don't have to be removed by a cleaning operation as it is chemically inert. However, if cleaning is required, the residue left after reflow can be easily removed if needed with a large range of cleaning solutions, such as detergents, hydro-carbonated solvents or halogenated solvents, all included in the INVENTEC cleaning range. This is also a best practice for a robust adhesion if conformal coating is to be applied on the board. In the table below is a quick reference about INVENTEC PCBA defluxing 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 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 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.

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