ECOREL™ FREE 305- 6D

Lead Free solder paste
High reliability residue

BENEFITS

ECOREL™ FREE 305-6D has been developed to address the diverse and complex requirements of the military industry:

- No clean solder paste with chemically inert residue after reflow,
- Paste compatible with conformal coatings qualified in the military industry, ie passes both the IPC and BONO SIR tests even after applying a polyurethane conformal coating,
- Very low ionic contamination without post reflow cleaning : **ECOREL™ FREE 305-6D** exhibits low ionic contamination after reflow and without cleaning,
- Easy to remove paste residue using standard solutions when necessary, detergents or solvents can be used to for cleaning.

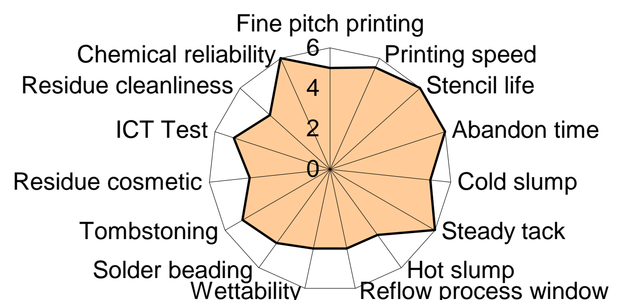
SPECIFICATIONS

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**	700 – 900
Post reflow residues	approximately 5 % w/w

CHARACTERISTICS

The chart below shows the excellent printing capabilities of **ECOREL™ FREE 305-6D** wich allow for:

- High speed printing (see use conditions chapter)
- High and steady tack performance allows for component placement several hours after printing.
- Abandon time of several hours is possible with good printing restart
- Stencil life over 12 hours (Paste life time in a continuous printing process)
- Abandon time over 4 hours(for 0.4 mm pitch, 120 microns stencil - Maximum time between two prints with good print restart)



Standards 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
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 MO.SB.10029

PROCESS PARAMETERS

Store at room temperature at least four hours before 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 on the stencil solder paste to form a roll of 1 to 2 cm of diameter all along the squeegee or around 100g per 10cm of squeegee length. This way, the solder paste will roll easily under the squeegee to offer excellent printing quality.

Printing speed: 20 to 150mm/sec (1 to 12 in/s)
Minimum pitch: 0.3 mm
Pressure: depends on printing speed and printing equipment

Typical speed / pressure set up

Largeur de racle	Vitesse	Pression
250	50mm/s 100mm/s 150mm/s	3.5kg 4kg 5kg
400	50mm/s 100mm/s 150mm/s	4kg 5.5kg 7kg

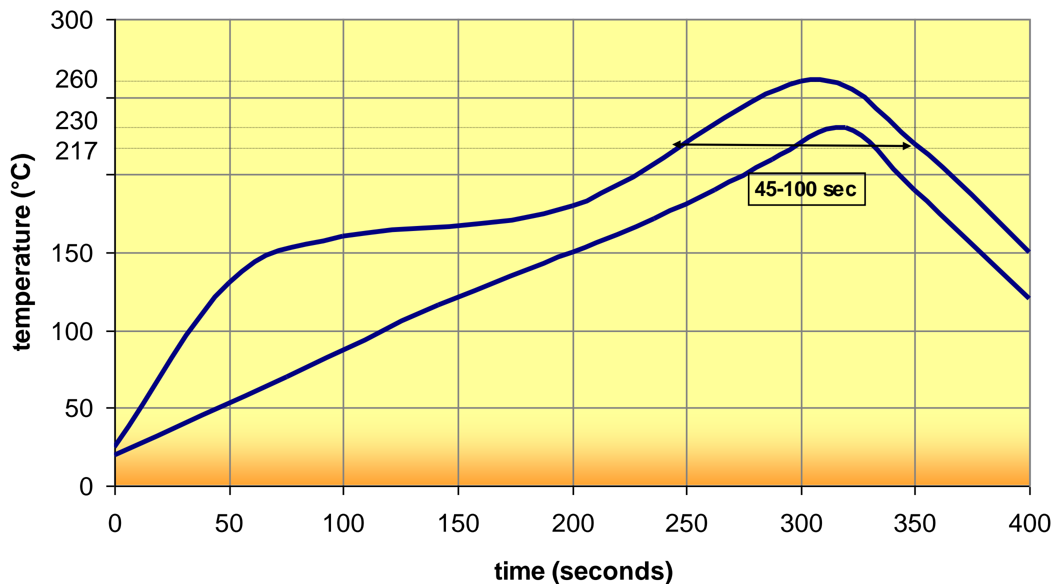
Reflow guideline

Nitrogen atmosphere allows excellent wettability inside a large reflow process window. Linear preheating ramp rate is recommended. But high density boards require 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°C/s according the circuit board size and density
Preheating steps in case of preheating soak zone	- From 20 to 150°C: ramp rate 1-2°C/s - soak zone between 150-180°C for 60 to 140s - from 170 to liquidus 1.0-2.0°C/s
Peak ramp rate	1.0-2.0 °C/s
Peak temperature	235-250°C (240-245°C real optimum) Paste can stand higher temperature than 250°C, but it is not recommended to preserve component integrity
Time above liquidus	45-90s (55-70s typical)
Cooling ramp rate	1.8-7°C/s (studies have demonstrated 1.8-2.2°C/s allow homogeneous joint structure and reduce surface cracks formation)

Example of reflow profiles ECOREL™ FREE 305-6D

- With linear pre-heating
- With soak zone



Cleaning

After soldering, the flux residue remaining of **ECOREL™ FREE 305-6D** does not 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 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

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 vertical position, tip downwards.

Jars	250g or 500g	12 months
Cardriges	600g or 1200g	9 months
Proflow cassette	750g	9 months

HSE

No issues when used as recommended.
Please refer to Material Safety Data sheets can be found at www.quickfds.com

Although the conformity to ROHS 2011/65UE 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.

ECOREL FREE-305-6D-BRY-FP-242-v1GB

INVENTEC, 26 avenue du Petit Parc, 94683 Vincennes Cedex • France
Tel. : 33.(0)1.43.98.75.00 • Fax : 33.(0)1.43.98.76.20