

ECOREL™ FREE 305-6D33



Lead free solder paste
High reliability residue

FEATURES

ECOREL™ FREE 305-6D33 has been developed to address the diverse and complex requirements of the military, transport and energy industries.

- No clean solder paste with chemically inert residue after reflow,
- Paste compatible with conformal coatings, ie passes both the IPC and BONO SIR tests even after applying a polyurethane or acrylic conformal coating,
- Very low ionic contamination without post reflow cleaning : **ECOREL™ FREE 305-6D33** exhibits low ionic contamination after reflow and without cleaning,

The spider chart below shows the excellent printing capabilities of **ECOREL™ FREE 305-6D33** with long stencil life. High speed printing is possible. High and steady tack performance allows for component placement several hours after printing. (Abandon time of several hours is possible with good printing restart).

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

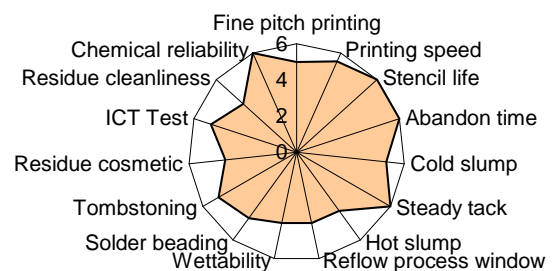
CHARACTERISTICS

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)

Steady tackiness more than 16 hours

High speed printing
(see Use Conditions chapter)



FUNCTIONNAL 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	$> 10^{12}$	
BONO test	pass	INVENTEC MO.SB.10029

PACKAGING

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

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, shelf life is 9 months.

For an optimal preservation, store cartridges and syringes in vertical position, tip downwards.

PROCESS PARAMETERS

Solder paste preparation

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

Printing guideline

Apply solder paste on the stencil 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 and squeegees length :

Squeegees	Speed	Pressure
250	50 mm/sec	3,5 kg
	100 mm/sec	4 kg
	150 mm/sec	5 kg
400	50 mm/sec	4 kg
	100 mm/sec	5,5 kg
	150 mm/sec	7 kg

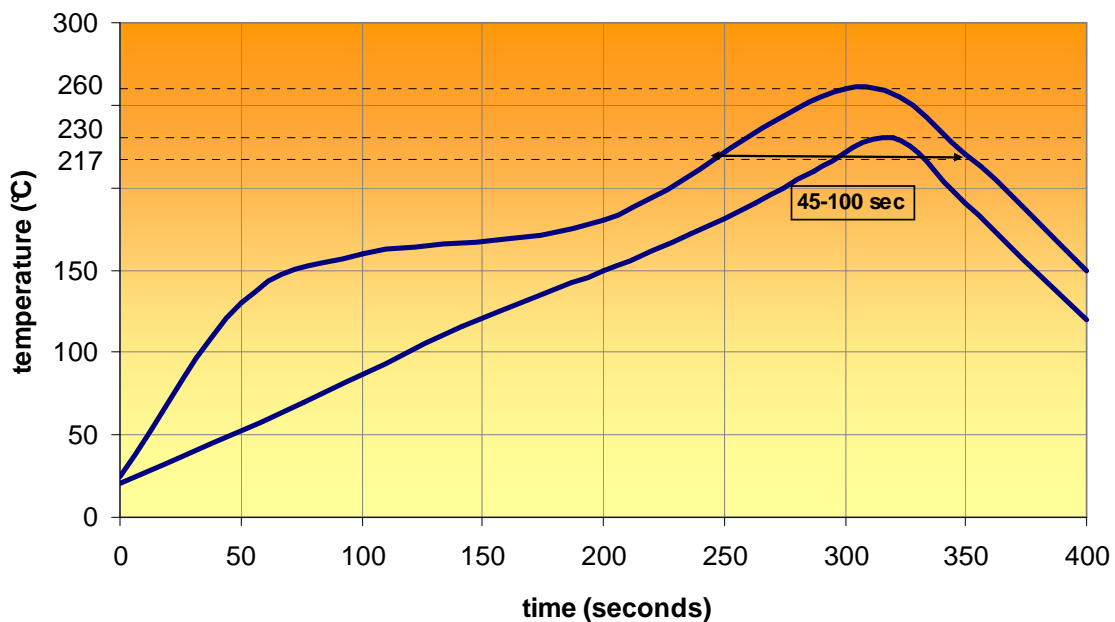
Reflow guideline

Linear preheating ramp rate is recommended. But high density boards require soak zone during preheating to homogenize temperature over the circuit board before reflow peak.

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 at low homogeneous joint structure and reduce surface cracks formation)

Typical reflow profile

Reflow Process Window Ecorel Free 305-6D33



Cleaning

ECOREL™ FREE 305-6D33 residues after reflow can also be very easily removed with a very large range of cleaning solutions, such as detergents, hydrocarbonated solvents or halogenated 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
Novel™ 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.

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