

SOLDERING

ECOREL™ FREE 305-WS12

SAC305 LEAD FREE SOLDER PASTE
SMT PRINTING PROCESS
EXCELLENT WETTING PROPERTIES

BENEFITS

ECOREL FREE 305-WS12 is a lead-free water-soluble solder paste especially designed for fine pitch SMT & semiconductor processes where post reflow flux removal is required. The formulation has been optimized to achieve excellent wetting and easy cleanability. The long stencil life and steady tackiness contributes to a stable process.

PERFORMANCE	<ul style="list-style-type: none"> High production throughput Very good wetting on all surface finishes, including OSP Excellent paste transfer volume
COST	<ul style="list-style-type: none"> Good first pass yield testability in ICT Post soldering residues easily cleaned
HSE	<ul style="list-style-type: none"> Lead free Free of CMR containing substances Greenway product

FEATURES

STANDARD OPTIONS

SPECIFICATIONS	ECOREL FREE 305-WS12 T4	ECOREL FREE 305-WS12 T5
Alloy	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5
Melting point (°C/°F)	217 / 422	217 / 422
Metal content (%)	89 +/-0,5	88 +/-0,5
Post reflow residues	Approximately 5% by w/w	Approximately 5% by w/w
Halogen content	<0,5% halide	<0,5% halide
Powder size	20 - 38 microns / Type 4	15-25 microns / Type 5
Spiral pump* Viscosity (Pa.s 25°C)	Typical 300	Typical 210

*The equipment used to test spiral pump viscosity is Malcom at a 10 rpm rotation speed.

The chemistry of ECOREL FREE 305-WS12 is also available with other alloys and particle sizes on request.

CHARACTERISTICS

CHARACTERISTICS	VALUES	METHOD
Flux Classification	REH1	ANSI/J-STD-004
	122	ISO 9454
Solder balling test	Pass	ANSI/J-STD-005
Copper mirror	H	ANSI/J-STD-004
Copper corrosion	Major	ANSI/J-STD-004
SIR (IPC)	Pass	ANSI/J-STD-004
SIR after cleaning (Bellcore)	Pass	Bellcore
Electromigration (IPC / Bellcore)	Pass	ANSI/J-STD-004 / Bellcore

PROCESS RECOMMENDATION

The best process will depend on factors such as operating conditions, equipment, board or component design. Our team is ready to advise you.

SOLDER PASTE PREPARATION

- Put the paste at room temperature for at least 4 hours prior to use.
- 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.
- Automatic solder paste mixing is neither required nor advised.

PRINTING GUIDELINE

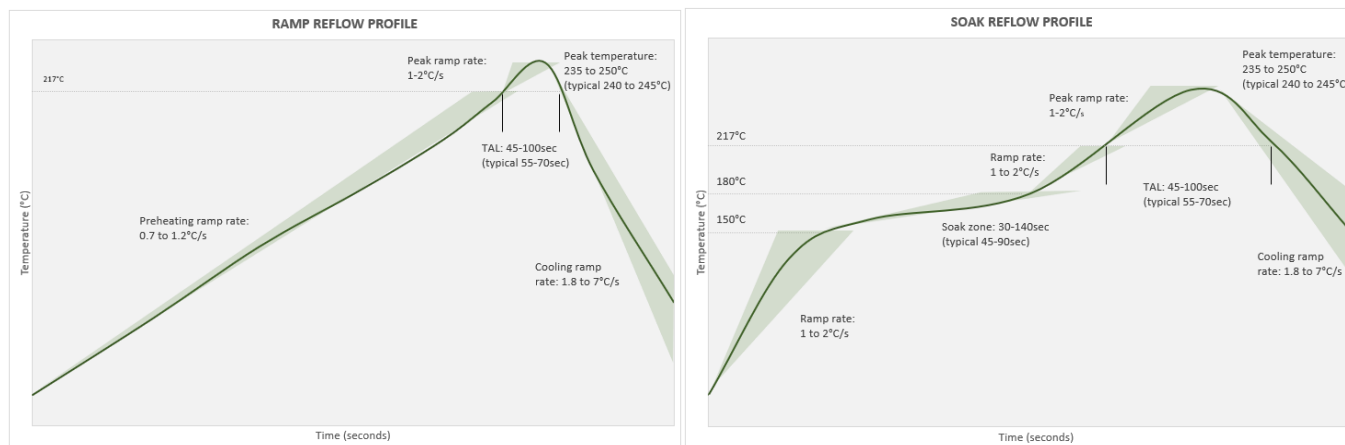
Apply the solder paste to the stencil to form a roll of 1 to 2 cm in diameter all along the squeegee or around 100g per 10 cm of squeegee length. This way, the solder paste will roll easily under the squeegees to offer excellent printing quality.

PARAMETER	REMARK
Printing speed	<ul style="list-style-type: none"> Minimum 20 to maximum 100 mm/s (1 to 4 inch/s) Maximum depends on printer capabilities
Minimum pitch	0.4 mm for Type 4 powder
Pressure	<ul style="list-style-type: none"> Guideline value for a 250 mm squeegee is 7 Kg at 100 mm/s for T4 Guideline value for a 250 mm squeegee is 4kg at 30mm/s, 7kg at 80mm/sec and 11 kg for 100mm/sec for T5 Actual value depends on equipment, printing speed and squeegee length
Stencil life in continuous printing process	8 hours
Abandon time between prints	2 hours
Steady tackiness	6 hours

REFLOW GUIDELINE

This paste can be processed under a protective atmosphere (nitrogen) but reducing atmosphere (nitrogen/hydrogen mixture) is strongly recommended to improve solder quality and to avoid micro balling.

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.



REFLOW STEPS	REMARKS
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	<ul style="list-style-type: none"> From 20 to 150°C (68 to 302°F) ramp rate 1 to 2°C/s Soak zone between 150 to 180°C (302 to 356°F): 60-140s reflow (typical soak 45-90s) From 170°C (380°F) to liquidus 1 to 2°C/s
Peak ramp rate	1 to 2 °C/s
Peak temperature	<ul style="list-style-type: none"> 235 to 250°C (455 to 582°F) / 240 to 245°C (464 to 473°F) is optimum The paste can withstand a temperature higher than 250°C (482°F), but it is not recommended to preserve component integrity.
Time above liquidus	45 to 100s - 55 to 70s typical
Cooling ramp rate	1.8 to 7°C/s Studies has demonstrated 1.8 to 2.2 °C/s allows a more homogeneous joint structure and reduced surface crack formation.

CLEANING POST SOLDERING

Cleaning after soldering is required. The remaining flux residue can be easily removed by hot water only or by adding a detergent to enhance the cleaning performance and process time. We recommend to clean not longer than 4 hours after soldering but it also depends on external factors like humidity and temperature.

Inventec has over 60 years' experience in high-tech cleaning for aqueous and solvent based systems. Our solder materials are aligned with our cleaning solutions, which guarantees excellent cleaning.

PROCESS TYPE	PCBA DEFLUXING SOLUTIONS
Manual	Quicksolv™ DEF90, Quicksolv™ DEF70
Aqueous (Immersion or spray)	Promoclean™ DISPER 607, Promoclean™ DISPER 707, Promoclean™ DISPER 800

Other products available, depending on specific customer requirements. Also check our maintenance cleaning solutions.

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.
- Shelf-life is 9 months for T4 version and 6 month for T5 version in all packaging.

AVAILABLE PACKAGING



JAR
250g & 500g



CARTRIDGE
600g

HEALTH, SAFETY & ENVIRONMENT

ECOREL FREE 305-WS12 is a GREENWAY product. More info on our Greenway concept via this link.



MAIN CONTRIBUTORS WHICH REDUCE IMPACT:

HUMAN HEALTH & SAFETY

- Lead-free alloy
- Non-toxic & no CMR containing substances

ENVIRONMENT PROTECTION & RESOURCES SAVINGS

- Low environmental impact: no H labelling regarding aquatic toxicity
- Made from recycled metals, reducing substantially carbon footprint
- Water-cleanable formulation minimizes needs for cleaning chemicals

No issues when used as recommended.

In accordance with the Annex II of Directive 2011/65/UE (RoHS), including its amendments, we certify that this product does not contains quantities above 0.1% of Hg, Pb, Cr VI, PBB, PBDE, DEHP, BBP, DBP, DIBP and above 0.01% of Cd. . INVENTEC PERFORMANCE CHEMICALS also fulfils its direct obligations under the REACH and Conflict Mineral regulations.

Although the conformity to ROHS 2015/863/UE applies to EQUIPMENT put on the market and not a component in particular, we warranty that this product does not contains in quantities exceeding less than 0.1% of Hg, Pb, Cr VI, PBB, PBDE, DEHP, BBP, DBP, DIBP and less than 0.01% of Cd, in accordance with the decision of The European Commission, fixing the maximal concentration values.

Please refer always to the Safety Data Sheet (SDS or MSDS) prior to use. Our SDS can be downloaded at www.quickfds.com. We will request to provide your email address, so we can automatically send you a new version of the SDS when a future update would occur.

TECHNICAL SUPPORT & FREE-OF-CHARGE TESTING

Inventec has a worldwide dedicated Technical Support team to help you along the various stages of our cooperation.

Depending on your request, we provide online or onsite support

- to select the right product based on your specific needs.
- to assist you in your product qualification process.
- to guide you with the initial set up of your process at all your worldwide manufacturing facilities.
- to provide fast response on technical issues which could occur at any time during mass production.

When prior cleaning is required, customers are also welcome in our CLEANING CENTERS to see the process in action and to get convinced by our solutions. We cover water and solvent based processes.

Inventec is unique in the world by developing not only soldering materials but also cleaning and coating solutions. These materials are very closely linked with each other from a process point of view. Talking to our Technical Team, who understands very well these 3 different product groups, will help you greatly to overcome technical challenges within your overall process.

Contact our technical support via contact@inventec.dehon.com or your local sales representative.

ABOUT INVENTEC

Inventec is a global provider of SOLDERING, CLEANING, COATING, COOLING materials for Electronic, Semiconductor and Industrial applications. For over 60 years we have shown leadership in innovation by putting HEALTH IMPACT, SUSTAINABILITY and RELIABILITY at the core of our product development.

With ISO 9001 & 14001 production sites in France, Switzerland, USA, Mexico, Malaysia and China we can guarantee a smooth and cost-effective supply chain.

We supply to many industries but the excellent performance of our products in applications which demand high reliability, leads us to focus especially on the AUTOMOTIVE, AEROSPACE, SEMICONDUCTOR, ENERGY and MEDICAL industry.

www.inventec.dehon.com



SOLDERING
CLEANING
COATING
COOLING

This data is based on information that the manufacturer believes to be reliable and offered in good faith. In no event will INVENTEC PERFORMANCE CHEMICALS 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.

Inventec Performance Chemicals – 26 rue de Coulons. 94360 Bry-sur-Marne, France
Limited company with capital of 600 000€ - 964 500 706 RCS Créteil