SOLDERING

ECOREL™ 305-16LVD

SAC305 LEAD FREE SOLDER PASTE
NO CLEAN SMT PRINTING & DISPENSING PROCESS
EXCELLENT LOW VOIDING

BENEFITS

ECOREL 305-16LVD is especially designed to reduce the dimension and amount of voids. This is especially beneficial when soldering bottom terminated components and for applications where excellent thermal management is crucial. A reduction of voids contributes to a better heat dissipation, more reliable electrical connection and a better intermetallic solder joint strength.

This solder paste is furthermore well balanced in terms of wettability, reliability, good compatibility with most conformal coating in the market and transparent clear residues. Besides the type 4 solder paste formulations are made from 100% recycled metals and paste in jar packaging can be stored at room temperature, which contributes to an overall reduction in CO2 emissions.

PERFORMANCE	▪ Low voiding to offer great heat dissipation ▪ Very good wetting on all surface finishes, including OSP ▪ Transparent colorless residue, even after multiple reflow cycles
COST	▪ Long stencil lifetime reduces equipment downtime and paste waste ▪ Increase lifetime and reliability of your product, hence reduces risk of premature failures.
HSE	▪ Lead Free ▪ No halogen ▪ Free of CMR containing substances

FEATURES

STANDARD OPTIONS

SPECIFICATIONS	ECOREL 305-16LVD 88.0T4	ECOREL 305-16LVD 88.5T4	ECOREL 305-16LVD 88.5T5
Alloy	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5
Melting point (°C/°F)	217 / 422	217 / 422	217 / 422
Metal content (%)	88	88.5	88.5
Post reflow residues	Approximately 5% by w/w	Approximately 5% by w/w	Approximately 5% by w/w
Halogen content	No Halogen	No Halogen	No Halogen
Powder size	20 – 38 microns / Type 4	20 – 38 microns / Type 4	15-25 microns / Type 5
Spiral pump* Viscosity (Pa.s 25°C)	Typical 135	Typical 135	Typical 155

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

SPECIFICATIONS	ECOREL 305-16LVD 88.0T6
Alloy	Sn96,5Ag3Cu0,5
Melting point (°C/°F)	217 / 422
Metal content (%)	88
Post reflow residues	Approximately 5% by w/w
Halogen content	No Halogen
Powder size	5-15 microns / Type 6
Spiral pump* Viscosity (Pa.s 25°C)	**Range 125-185

*The equipment used to test spiral pump viscosity is Malcom at a 10 rpm rotation speed.
**Slight adjustments in viscosity possible after finalizing full industrialization test procedure.

DISPENSING OPTIONS

SPECIFICATIONS	ECOREL 305-16LVD 85.0T5
Alloy	Sn96,5Ag3Cu0,5
Melting point (°C/°F)	217 / 422
Metal content (%)	85
Post reflow residues	Approximately 5% by w/w
Halogen content	No Halogen
Powder size	15-25 microns / Type 5
Spiral pump* Viscosity (Pa.s 25°C)	Typical 65

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

ADDITIONAL OPTIONS ON REQUEST

SPECIFICATIONS	ECOREL 305-16LVD 88.0T3	ECOREL 305-16LVD 89.0T4	ECOREL 305-16LVD 88.0T5
Alloy	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5
Melting point (°C/°F)	217 / 422	217 / 422	217 / 422
Metal content (%)	88	89.0	88.0
Post reflow residues	Approximately 5% by w/w	Approximately 5% by w/w	Approximately 5% by w/w
Halogen content	No Halogen	No Halogen	No Halogen
Powder size	25 – 45 microns / Type 3	20 – 38 microns / Type 4	15-25 microns / Type 5
Spiral pump* Viscosity (Pa.s 25°C)	Typical 135	Typical 170	Typical 155

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

The chemistry of 16LVD is also available with other alloys and particle sizes on request.

CHARACTERISTICS

CHARACTERISTICS	VALUES	METHOD
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
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
Bono Corrosion test (85°C / 85% HR – 15 days)	Pass Corrosion Factor <8%	Inventec procedure

ECOREL 305-16LVD achieves very low level of voiding, especially for power components (QFN, DPAK, etc.).

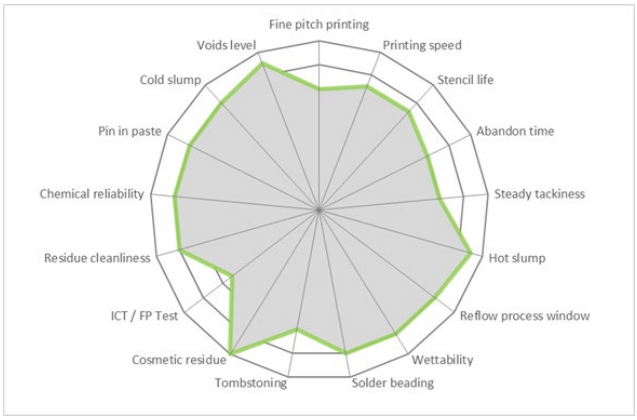


NON-OPTIMIZED PASTE



ECOREL 305-16LVD

RADAR CHART: ECOREL 305-16LVD T4



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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

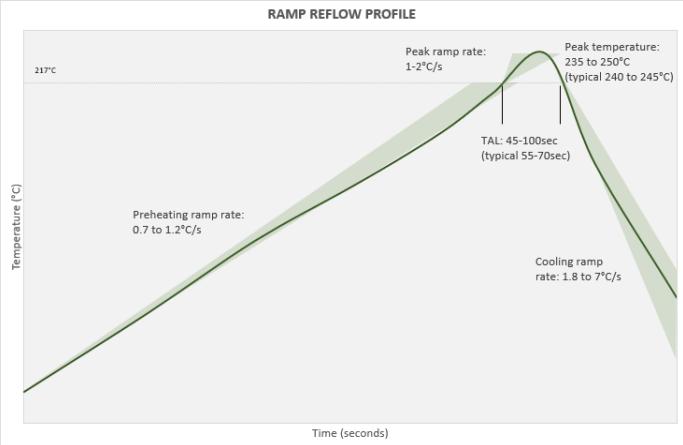
Apply the solder paste to the stencil to form a roll of 1 to 2 cm in diameter all along the squeegee or around 100g per 10 cm of squeegee length. This way, the solder paste will roll easily under the squeegees to offer excellent printing quality.

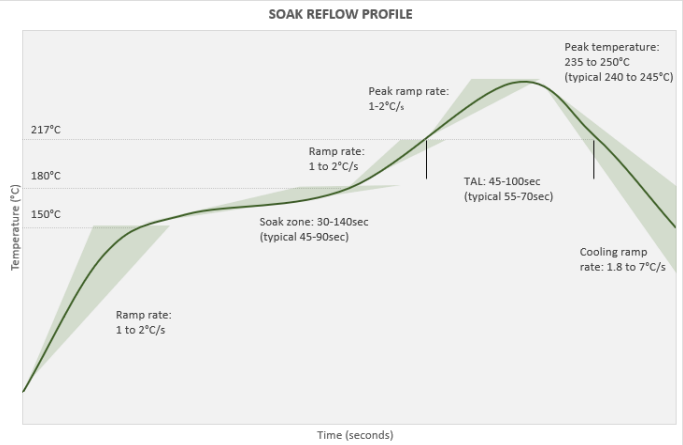
PARAMETER	REMARK
Printing speed	Minimum 20 to maximum 150 mm/s (1 to 6 inch/s) Maximum depends on printer capabilities
Minimum pitch	0.4 mm for Type 4 powder
Pressure	Guideline value for a 250 mm squeegee is 7 Kg at 100 mm/s Actual value depends on equipment, printing speed and squeegee length
Stencil life in continuous printing process	>12 hours
Abandon time between prints	>2 hours
Steady tackiness	>12 hours

REFLOW GUIDELINE

Although this paste performs very well under air, a nitrogen atmosphere will even more improve the wettability whereas achieving even a larger reflow process window.

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	▪ From 20 to 150°C 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	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.

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CLEANING POST SOLDERING

This product is a no-clean solder paste, so cleaning is not required to meet IPC standards. The chemistry is specially designed so that any remaining flux residue is chemically inert and will not impact your assembled board or packaging under normal conditions. However, when cleaning is desired or required (e.g. high reliability assembly or to improved conformal coating adhesion), the flux residue can be easily removed with INVENTEC's own formulated flux cleaners.

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 with our materials.

PROCESS TYPE	PCBA DEFLUXING SOLUTIONS
Manual	Quicksolv™ DEF90, Quicksolv™ DEF70
Aqueous (Immersion or spray)	Promoclean™ DISPER 607, Promoclean™ DISPER 707, Promoclean™ DISPER 800
Co-solvent	Topklean™ EL 20P or EL 20A + Promosolv™ rinsing solvents
Mono-solvent (vapor phase)	Promosolv™ 70ES

Other products available, depending on specific customer requirements. Check also our maintenance cleaning solutions.

PACKAGING, STORAGE & SHELF LIFE

ARTICLES / STORAGE CONDITIONS	ROOM TEMPERATURE (<30°C)	0°C TO 10°C
solder paste in jar for type 4	shelf life 6 months	shelf life 12 months
solder paste in jar for type 3, 5 & 6	confirmation test ongoing	shelf life 12 months
solder paste in cartridge	confirmation test ongoing	shelf life 9 months
solder paste in syringe	not possible	shelf life 6 months

- Room temperature storage is currently under evaluation for other packaging and powder sizes.
- For an optimal preservation, store cartridges in a vertical position, tip downwards.

AVAILABLE PACKAGING



JAR
250g & 500g

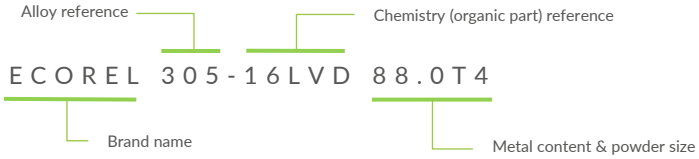
CARTRIDGE
600g & 1200g

SYRINGE*
30g (10cc) / 100g (30cc)

*Syringes only available for dispensing options

PRODUCT ARTICLE CODIFICATION

Below example as a reference



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HEALTH, SAFETY & ENVIRONMENT

ECOREL 305-16LVD 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

- No aquatic toxicity
- Made from recycled metals, reducing substantially carbon footprint
- No-clean formulation, minimizes the need for post reflow cleaning

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.

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 different 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 you 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.

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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.

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