# PRODUCT PROFILE

# ELECTROLOY NO CLEAN LEAD FREE PASTE

| **Product Name** | **Product Code** |
| --- | --- |
| **#515 – LEAD FREE PASTE – Sn96.5/Ag3.0/Cu0.5** | **EMCO#515-307P** |

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assure legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. No warranty of fitness for a particular purpose is made. Properties are typical and not to be used as specifications.

## PRODUCT DESCRIPTION

Electroloy's EMCO#515-307P* No Clean Solder Paste is specially formulated for lead free soldering applications. EMCO#515-307P uses a high shear resistance ingredient that offers excellent print capability. This flux system can withstand high preheating temperature without discoloration.

EMCO#515-307P delivers excellent wetting and soldering on most board finishes including OSPs, reducing solder balls formation and solder beading.

## ATTRIBUTES

- Excellent Printing Capability - Suitable for ultra fine pitch soldering operation
- Wide Reflow Window - Increase production process window
- Reduce Solderballing - Minimize rework
- Anti Solder Void Formulation - Meet IPC 7095 Voids Performance Classification Class III
- Excellent Paste In Hole Application - For printing, dispensing (or pin transfer) SMT applications

## CHEMICAL COMPOSITION OF ALLOY

Quality of Electroloy's EMCO#515-307P lead free solder paste in terms of composition of alloy is controlled strictly under Electroloy's Lead Free Specification LF-307.

| Elements | | Specification (%wt/wt) |
|---|---|---|
| Tin | Sn | Remainder |
| Lead | Pb | Max 0.050 |
| Aluminium | Al | Max 0.005 |
| Antimony | Sb | Max 0.050 |
| Arsenic | As | Max 0.030 |
| Bismuth | Bi | Max 0.050 |
| Copper | Cu | 0.4 – 0.6 |
| Iron | Fe | Max 0.010 |
| Zinc | Zn | Max 0.003 |
| Cadmium | Cd | Max 0.002 |
| Silver | Ag | 2.8 – 3.2 |
| Nickel | Ni | Max 0.010 |
| Indium | In | Max 0.050 |
| Gold | Au | Max 0.050 |

* Patent No: US 5527628

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assure legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. No warranty of fitness for a particular purpose is made. Properties are typical and not to be used as specifications.

## PHYSICAL APPEARANCE

Electroloy's solder paste exhibits a homogenous solder paste which is grey color.

## PARTICLE SIZE OF SOLDER POWDER

The particle size of solder powder is compliant with the International Standard Specification IPC J-STD-005. For Type 3 powder (25-45 µm) :

| %Of Sample By Weights | Nominal Size |
|---|---|
| Less than 1% larger than | 45 microns |
| 80%minimum between | 45-25 microns |
| 10% maximum less than | 20 microns |

Available in Type 4 by special request.

## CHARACTERISTICS OF EMCO#515-307P SOLDER PASTE

| Item | Characteristics | Standard / Test Method |
|---|---|---|
| Viscosity value | 160,000 ± 30,000 cp | PCU-203, 10rpm, 25°C |
| Flux classification | ROL0 | IPC J-STD-004 |
| Corrosion of copper plate | Pass (no corrosion) | IPC J-STD-004 |
| Flux content | 11.0 ± 0.5% | JIS Z 3197 |
| Spread Test | Pass | JIS Z 3284 Annex 10 |
| Solder Ball Test | Pass | IPC J-STD-005 |
| Stencil Life | >8 hours | @25°C/50%RH |
| Flux Residue Tackiness Test | Pass | JIS Z 3284 Annex 12 |
| Slump Test | Pass (10 min at 150°C)<br>Pass (0.2mm pitch-no bridging) | IPC J-STD-005<br>JIS Z 3284 Annex 8 |
| Insulation Resistance<br>(IPC 7 days @85°C/85%RH) | Pass (≥1 x $10^{10}$ Ω) | IPC J-STD-004 |
| Insulation Resistance<br>(Bellcore 96 hrs @35°C/85%RH) | Pass (≥1 x $10^{11}$ Ω) | Bellcore GR78 CORE |

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assure legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. No warranty of fitness for a particular purpose is made. Properties are typical and not to be used as specifications.

## APPLICATION

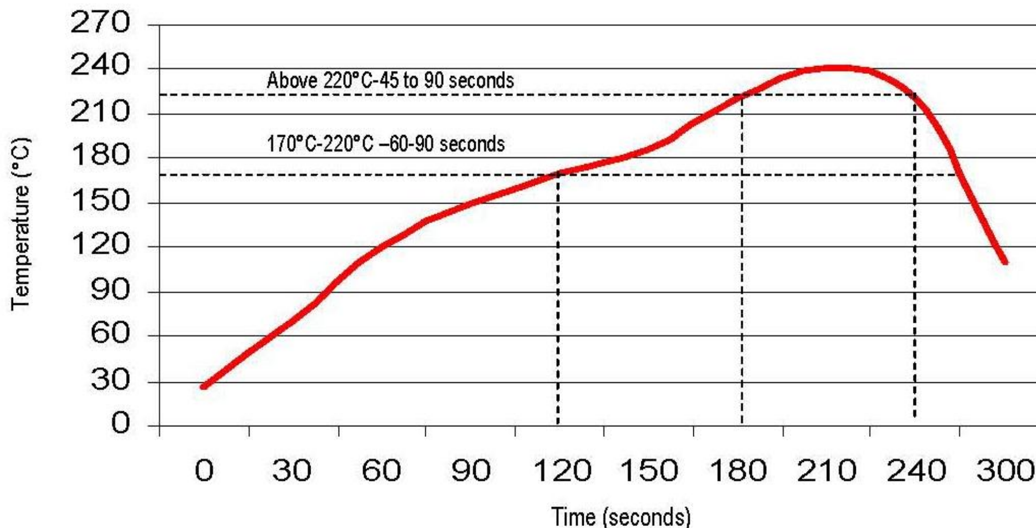
### Printing

| | | |
|---|---|---|
| Stencil Material | Stainless Steel | |
| Stencil Thickness | Pitch | Stencil Thickness |
| | 0.3-0.5 mm | 0.100-0.150 mm |
| | 0.635 mm | 0.150-0.200 mm |
| Squeegee | Stainless steel squeegee is recommended. | |
| Squeegee Pressure | 0.15-0.40 kg/cm squeegee length depending on printing speed. Higher printing speed may require high squeegee pressure. | |
| Squeegee speed | 25-100 mm/second | |
| Separation speed | 1-20 mm/second. Slow separation speed is recommended. | |
| Paste Roll | Maintain a paste roll diameter of 15-20 mm. | |

### Reflow

| | |
|---|---|
| Atmosphere | Hot air or Nitrogen |
| Typical Melting Point of Alloy | Sn96.5/Ag3.0/Cu0.5: 217-220°C |
| Typical reflow profile for EMCO#515-307P | |
| 40°C-220°C | <240 seconds |
| 130°C-220°C | <150 seconds |
| 170°C-220°C | <90 seconds |
| 220°C | 45-90 seconds |
| Peak Temperature | <240°C for CuOSP boards |
| Cooling Rate from 170°C | 3°C-8°C per second |

## RECOMMENDED REFLOW PROFILE FOR EMCO#515-307P




The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assure legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. No warranty of fitness for a particular purpose is made. Properties are typical and not to be used as specifications.

## CLEANING

| | |
|---|---|
| Misprint | Wipe clean with commercially available solvent cleaner |
| Post Cleaning | Residue of EMCO#515-307P is designed to be left on the board after Reflow. If cleaning is required, commercially available solvent cleaner may be used. |
| Stencil Cleaning | Commercailly available stencil cleaner is recommended with under stencil paper wipe. |

## PACKAGING

Each tub of solder paste is approximately 0.5kg and shall be sealed tightly. Traceable information will be shown on the sticker such as product code, alloy composition, particle size, net weight and lot number .The solder paste tub shall be placed in foam box and packed in carton boxes of about 10kg per box. Cartridge and syringe type of solder paste is available upon request.

## STORAGE AND SHELF LIFE

To ensure best performance, it is recommended to refrigerate at 3-10°C. Under recommended storage conditions, a shelf life of 6 months is achievable. Allow the paste to stabilize at room temperature for at least 4 hours before using. Before putting paste onto the stencil, it is essentially to properly mix the paste, either with a paste mixer or manually with a spatula for 1-2 minutes. Do not mix used paste with unused paste. This may alter the properties of the solder paste.

## DELIVERY

Each order can be shipped with the Certificate of Analysis for each lot.

## MATERIAL SAFETY DATA SHEET

A MSDS for this product can be request from our Sales personnel.

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assure legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. No warranty of fitness for a particular purpose is made. Properties are typical and not to be used as specifications.