SolderPlus®

EFD® A NORDSON COMPANY

We listen and respond.

SN96.5-511 Product Specification

Product Description

The EFD SolderPlus 511 series of No-Clean (NC) solder pastes for dispensing, feature low flux residue, superior wetting, and up to eight (8) hours of tack time. These solder pastes offer exceptional lot-to-lot consistency with excellent dispense resolution and reproducibility.

511 flux residue is colorless, transparent, hard, non-corrosive, inert, and designed to be left on your assembly. Cleaning is optional.

Quality

EFD solder pastes and fluxes meet or exceed IPC Joint Industry standards J-STD-004 for flux, J-STD-005 for paste, and J-STD-006A for alloy.

Material Properties

J-STD-004	
Classification	ROL0
Copper Mirror	No Breakthrough
Silver Chromate	Pass
Fluoride Spot	Pass
Corrosion	None
SIR 24 hours*	$1.1 \times 10^{10}\ \Omega$
SIR 96 hours*	$9.7 \times 10^{9}\ \Omega$
SIR 168 hours*	$7.0 \times 10^{9}\ \Omega$
J-STD-005	
Metal Content	84.5% +/- 0.5%
Viscosity at 25°C	400 +/- 50kcPs
Solderball Test	Preferred
Wetting Test	Pass
J-STD-006	
Alloy	Sn96.5Ag3.0Cu0.5
Particle Size	Type III (45-25 micron)
Melting Temp.	217-219˚C

Guarantee

EFD solder pastes have a guaranteed shelf life of six (6) months from date of shipment when stored and handled as recommended.

Delivery

SolderPlus solder paste is shipped direct from our factory via next-day air service within three (3) business days of order receipt, excluding weekend deliveries. For the full range of packaging options, reference our Packaging Guide.

Storage and Handling

Store between 4˚ and 21˚C (40˚ and 70˚F). Do not Freeze. Allow four (4) hours at room temperature before using. Exposure to temperatures in excess of 27˚C may cause flux separation and chemical decomposition. When not in use, containers should be kept closed.

Safety

Read the MSDS prior to use. Care should be taken to prevent accidental ingestion and contact with the eyes. Use adequate ventilation and avoid breathing soldering fumes. Wash hands thoroughly after use.

Technical Support

Our Product Specialists and Technical Service Team are available to evaluate your process requirements and develop a soldering solution with you.

Application Guidelines

Dispensing	
Best Working Environment	20˚C to 25˚C (68˚F to 77˚F) at 35% to 60% Relative Humidity
Dispensing Process	Ref: SolderPlus Dispensing Guide
Reflow	
Heating profile	Ref: page 2 of this specification
Cleaning	
Solvents	Ref: Flux Residue Removal Guide**
No Clean	Residue is designed to be left in place for typical applications.

* Nominal/Typical values

** EFD does not sell or recommend specific solvents but collaborates with any solvent vendor.

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Reflow Profiling

No single temperature profile is ideal for all products and heating methods. EFD solder pastes produce high quality solder joints across a wide range of heating processes.

In general, the shorter the reflow profile, the better the solder paste will perform. There is no advantage to a profile centered on the time ranges in the profile graphic below. For applications using "non-oven" heating methods, classic circuit board reflow profiling does not apply. Please contact technical support for these heating methods.

Preheat

Room temperature to 100ºC: During the preheat zone, low boiling point solvents and absorbed water evaporate. Too rapid heating can cause spatter.

Soak

100ºC to 130ºC: The soak stage is used to stabilize temperature across the entire product and continue evaporation of low boiling point materials. Small and thermally uniform parts do not need much soak, while boards with large components may require over a minute. Ball Grid Array (BGA) packages may require longer soak times to minimize formation of voids in the solder joints.

Activation

130ºC to 217ºC: The flux transitions from a gel state to a fluid state. The liquefied flux wets and cleans the surfaces being soldered.

Excessive activation time will use up available flux activity and may result in non-wetting, de-wetting, and related solder defects. A nitrogen atmosphere can be used to extend the activation window for products requiring very long reflow profiles.

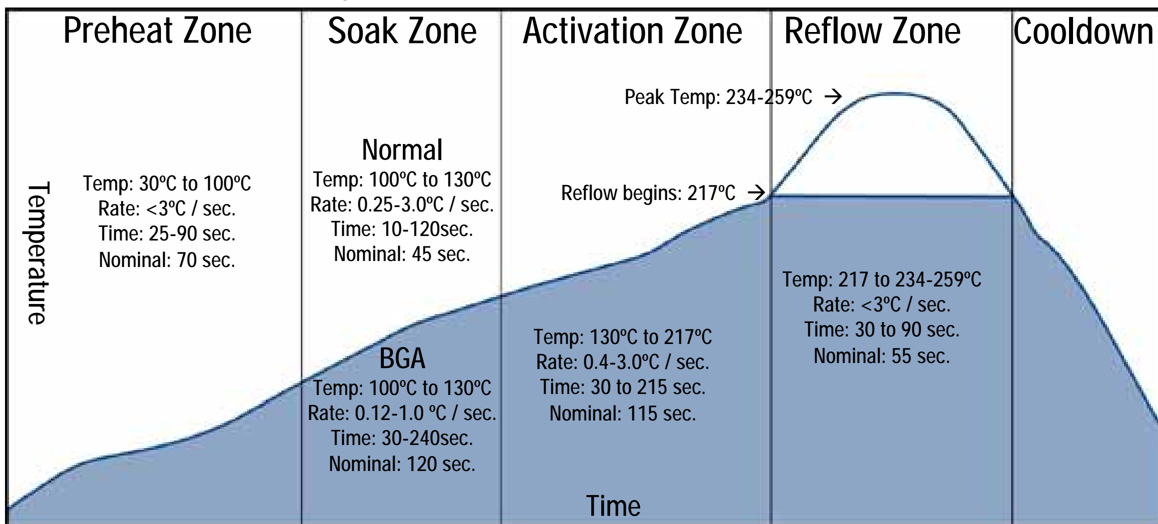
Reflow

217ºC up to 234-259ºC and back down to 217ºC: Soldering begins upon reaching the solidus temperature of the alloy being used. For maximum joint strength the alloy must reach a temperature above the liquidus. Typically, a peak of 15-40°C is targeted to ensure optimal wetting and to account for process variability.

Cooldown

Product is cooled down to safe temperatures prior to handling. Excessively rapid cooling can trap stress within an assembly through Coefficient of Thermal Expansion (CTE) mismatch.

Typical Circuit Board Reflow Profiles



Technical Service

Because of the variability of soldered devices and reflow equipment, it is often necessary to deviate from the typical profile given here. In such cases, we recommend you contact Technical Support at **800-338-4353**.

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