

SOLDER CONNECTION

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QUALITEK® Technical Bulletin

Delta 302 No Clean, Halogen Free Flux

DESCRIPTION

302 No Clean flux is a homogeneous mixture of halogen-free, low solids, organic flux designed for wave soldering conventional or surface mount PCB assemblies. 302 provides superior foaming characteristics with a uniform, stable head of small bubbles. 302 exhibits excellent wetting and fluxing activities with essentially no residue left on the assembly after soldering. 302 may be used for both leaded and lead-free applications.

FEATURES AND BENEFITS

- Halogen-free
- Excellent wetting
- Bright, shiny solder joints
- Low residue
- Rosin/Resin free
- Compatible with Lead-Free & Leaded Solder Systems

TECHNICAL DATA

| | Specification | Test Method |
|--|------------------------------|--------------------|
| Flux Classification | ORLO | JSTD-004-00B |
| Color and Appearance] | Light straw liquid | |
| SIR | 1.20 x 10 ¹¹ ohms | IPC-TM-650 2.6.3.3 |
| Specific Gravity (g/cm³) | 0.800 ± 0.006 | IPC-J-STD-004B |
| Solids Content | 2.3 ± 0.3 | IPC-TM-650 2.6.3.3 |
| Acid Number (mgKOH/g) | 18.0 – 21.0 | Titration |

PACKAGING

1L
5L
10L

CLEANING

302 is a no clean formulation therefore the residues do not need to be removed for typical applications. If residue removal is desired, the use of Everkleen 1005 Buffered Saponifier with a 5-15% concentration in hot 60 °C (140 °F) will aid in residue removal.

STORAGE & SHELF LIFE

Liquid flux should be stored in a 65-80°F environment away from direct heat and flame. Shelf life is 2 years from date of manufacture.

DISPOSAL

302 contains hazardous ingredients therefore the flux should be disposed of in accordance with local, regional and national requirements.

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APPLICATION

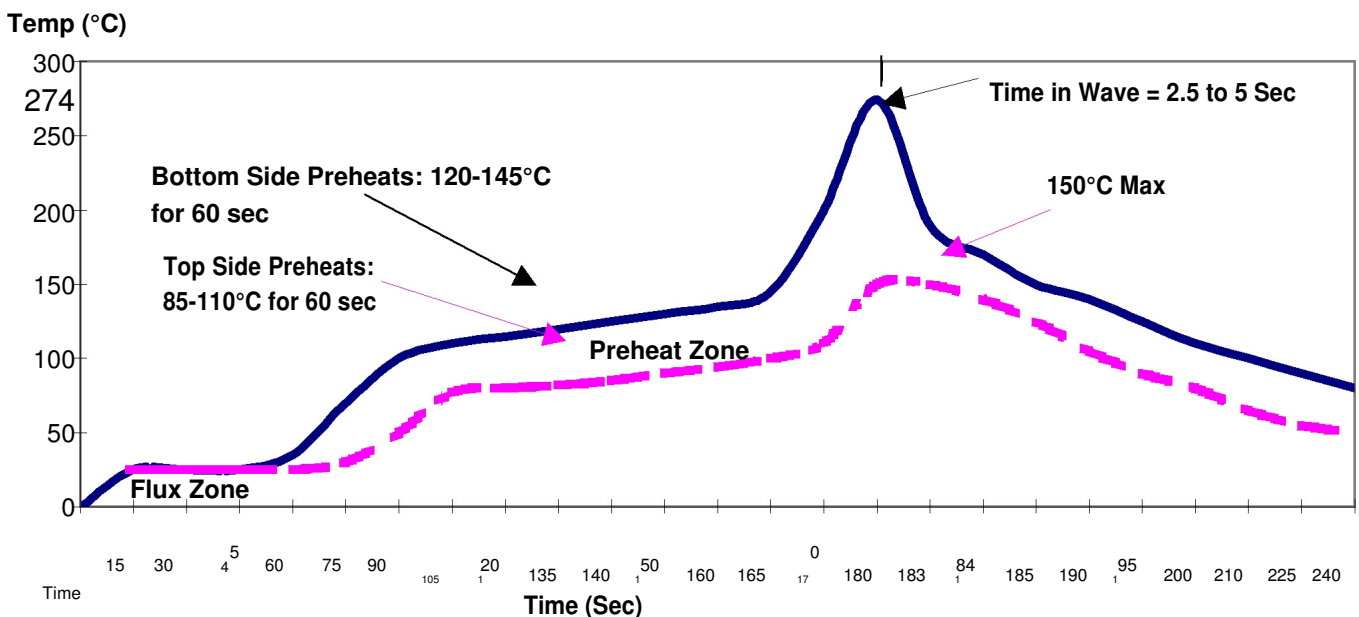
Flux Application

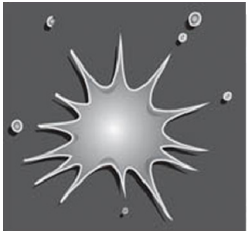
For mass wave soldering of OSP and plated circuit boards, spray, foam or wave fluxing can be utilized to apply this flux. Flux deposition density and uniformity are critical to successful use of low solids no-clean flux. If foam fluxing, the foam fluxer should be supplied with compressed air, which is free of oil and water. The flux tank should be full at all times. The surface of the flux should be 1-½ inches above the top of the flux aerator, or flux stone. Pressure should then be adjusted to produce the optimum foam height with a fine uniform foam head. After fluxing, an air knife should be used to remove excessive flux from the assembly.

Uniformity of the spray flux coating can be visually checked by running a tempered glass plate (usually supplied by machine manufacturer) through the spray and preheat sections, and inspected before going across the wave.

| OPERATING PARAMETERS | TYPICAL LEVEL |
|--|--|
| Amount of flux | Foam, Wave: 1000-2000 µg/in ² solids Spray: 750-1500 µg/in ² solids |
| Foam Fluxing Parameters | |
| Foam Stone Pore Size | 20-50 µm |
| Flux Level Above Stone | 1-1 ½ inches (25-40mm) |
| Chimney Opening | 3/8-1/2 inch (10-13 mm) |
| Air Pressure | 1-2 psi |
| Top Side Preheat Temperature | 190-230 °F (85-110 °C) |
| Bottom Side Preheat Temperature | 65 °F (35 °C) higher than topside |
| Conveyor Speed | 4-6 feet/minute (1.2-1.8 meters/minute) |
| Contact Time in the Solder (including Chip & Lambda) | 2.5-4.5 seconds |
| Solder Pot Temperature | |
| Sn96.5/Ag3.5 | 500-530 °F (260-276 °C) |
| Sn95/Ag5 | 536-565 °F (280-296 °C) |
| Sn99.3/0.7Cu | 510-530 °F (265-276 °C) |
| SnAgCu | 520-530 °F (271-276 °C) |
| Sn95/Sb5 | 536-565 °F (280-296 °C) |

TYPICAL Lead Free Wave Solder Profile (SNAGCU)

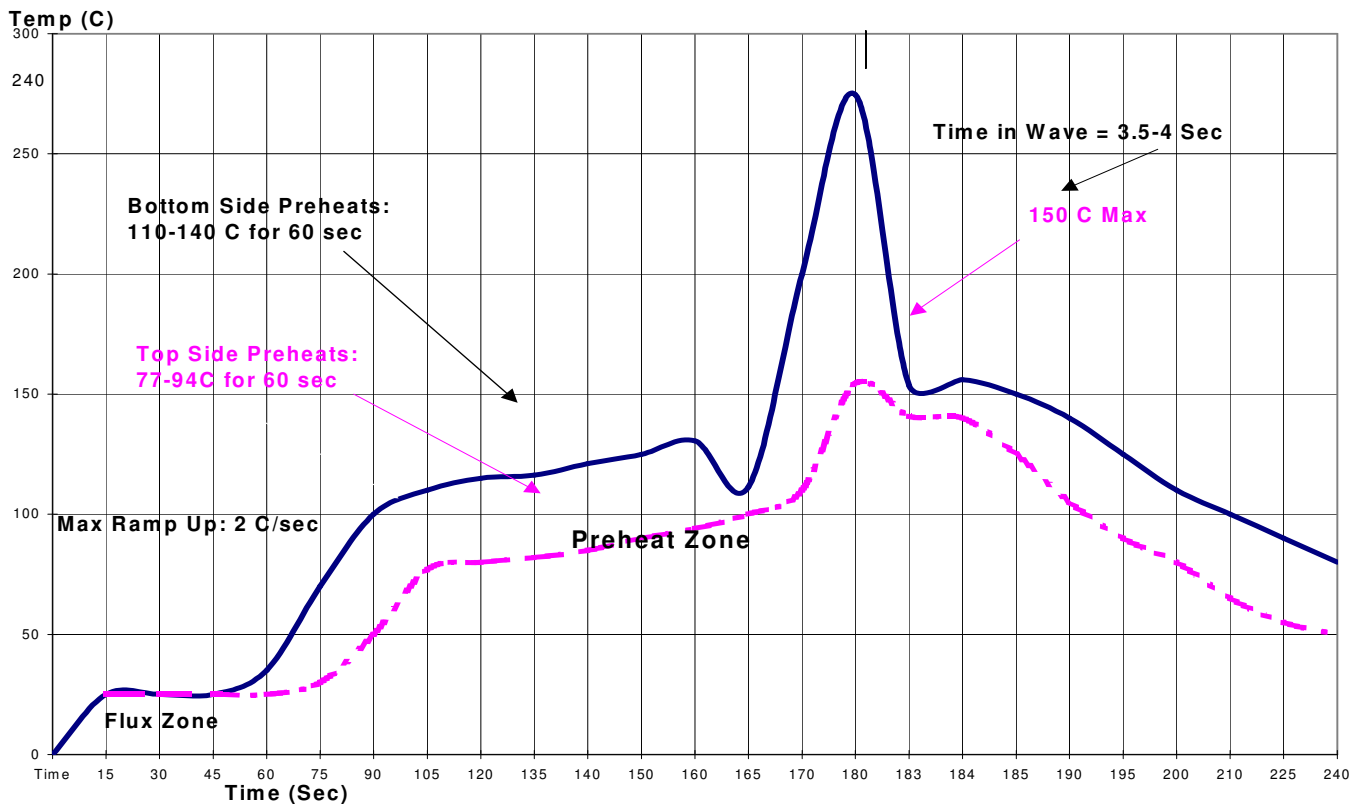




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TYPICAL Leaded Wave Solder Profile (Sn63/Pb37)



PROCESS CONTROL

Control of flux during use is necessary to assure consistent flux deposition on the circuit board. Due to the very low solids content of no clean fluxes, specific gravity is not an accurate measure for assessing solids content. Monitoring and controlling acid number by titration is recommended for maintaining the proper flux concentration. Control of the flux can be achieved with 300A thinner to maintain fluxing activity.

Over time debris and contaminants may accumulate in the flux reservoir. Therefore, periodically replacing the flux and cleaning the reservoir is recommended for consistent performance and minimizing debris build-up

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