Technical Bulletin

Delta 381 No Clean Flux

DESCRIPTION

381 is a No Clean halide-free flux designed for both wave soldering and surface mount board assembly applications. The low solids content of 381 flux results in virtually no residue remaining on the boards after soldering. 381 No Clean flux may be used with both high temperature Lead-Free and Sn-Pb soldering processes. 381 flux has been designed to improve soldering performance by minimizing bridging and other solder defects.

FEATURES & BENEFITS

- Halide-free
- Low residue
- Excellent wetting
- Non-conductive/Non-corrosive residues
- Compatible with Lead-Free & Leaded Solder Systems

TECHNICAL SPECIFICATIONS

	Specification	**Test Method**
Flux Classification	ROL0	JSTD-004-00B
Color and Appearance	Light Straw	
Copper Mirror	Liquid Pass	IPC-TM-650 2.3.32
Corrosion	Pass	IPC-TM-650 2.6.15
SIR	2.36 x 10^{13} ohms	IPC-TM-650
Specific Gravity (g/cm3)	0.800 ± 0.005	2.6.3.3
Solids Content	3.75 ± 0.75	
Acid Number (mgKOH/g)	19.0 – 22.0	IPC-TM-650 2.3.34 Titration

CLEANING

381 is a no clean formulation, therefore, the residues are not required 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.

HANDLING & STORAGE

381 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.

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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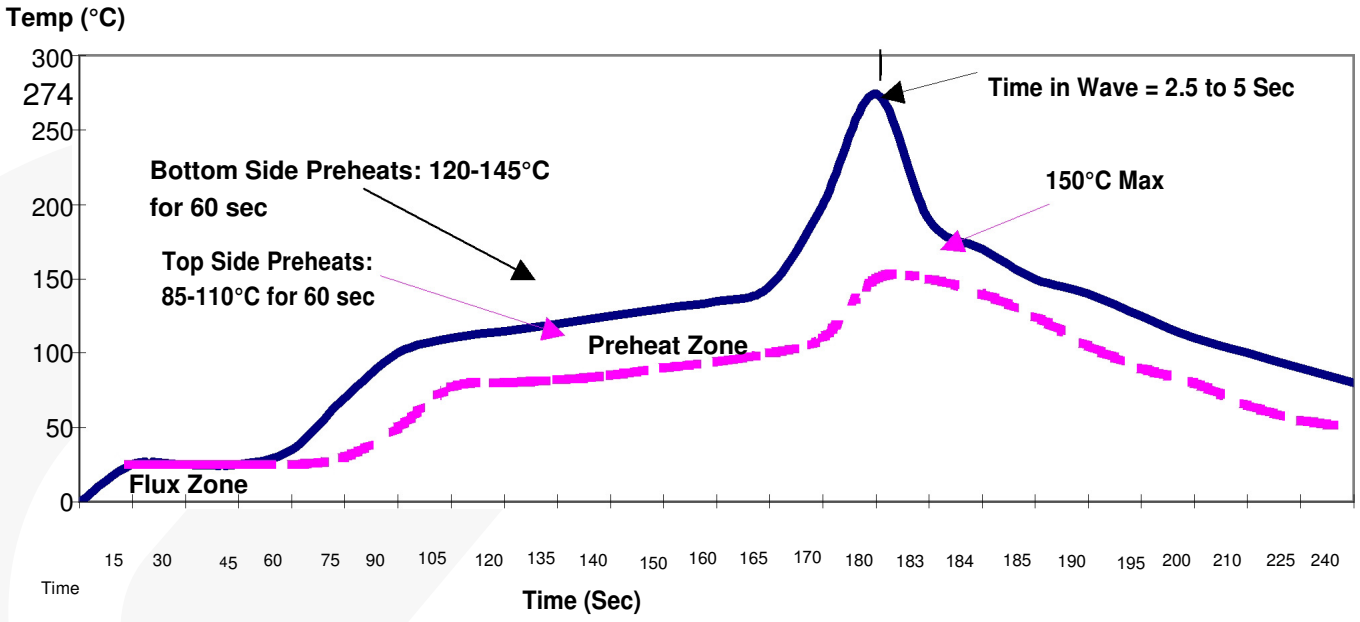
APPLICATION METHODS

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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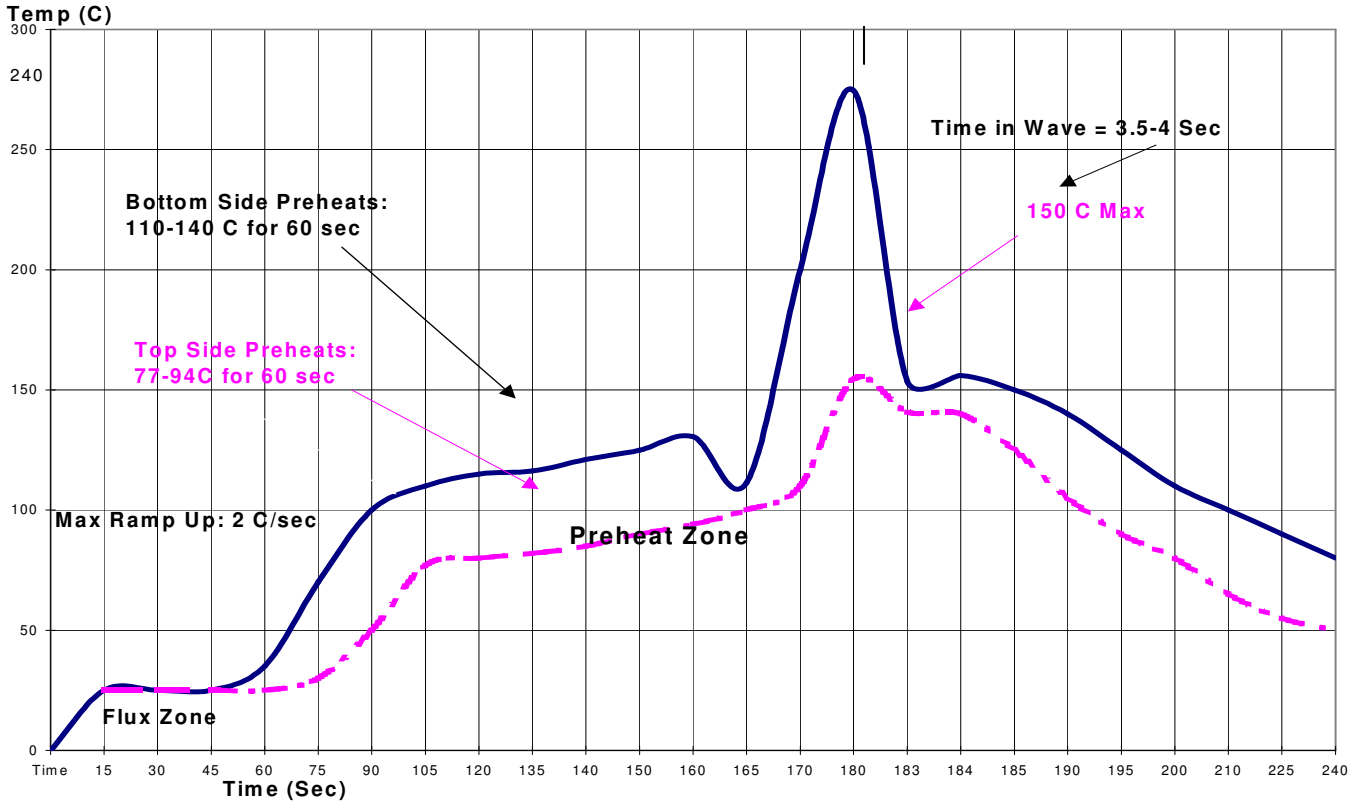
TYPICAL Leaded Wave Solder Profile (Sn63/Pb37)



AVAILABILITY

1L / 5L / 10L Containers

HEALTH & SAFETY

Use with adequate ventilation and proper personal protective equipment. Refer to the accompanying Safety Data Sheet for any specific emergency information. Do not dispose of any hazardous materials in non-approved containers. Dispose of in accordance with local, regional and national requirements.

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