

SOLDER CONNECTION

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QUALITEK® Technical Bulletin

Delta 399-42 No Clean Flux

DESCRIPTION

399-42 is a homogeneous mixture of halogen-free, low solids organic flux designed for high-temperature lead-free wave-soldering, selective soldering, surface mount assembly and through-hole applications. 399-42 exhibits excellent wetting and through-hole fill. 399-42 was formulated specifically for lead-free soldering processes.

FEATURES AND BENEFITS

- Halogen free
- Excellent Hole fill
- Specifically designed for Lead-Free solder systems

TECHNICAL DATA

	Specification	Test Method
Flux Classification	ORLO	JSTD-004-00B
Color and Appearance	Colorless Liquid	
Copper Mirror	Pass	IPC-TM-650 2.3.32
SIR	1.13 x 10 ¹³ ohms	IPC-TM-650 2.6.3.3
Specific Gravity (g/cm³)	0.830 ± 0.005	
Solids Content	4.5 ± 0.5	
Acid Number (mgKOH/g)	36.0 – 38.0	Titration

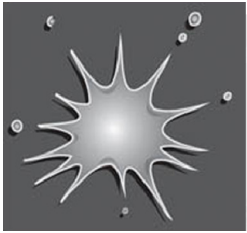
APPLICATION

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/Cu0.7	510-530 °F (265-276 °C)
SnAgCu	520-530 °F (271-276 °C)
Sn95/Sb5	536-565 °F (280-296 °C)

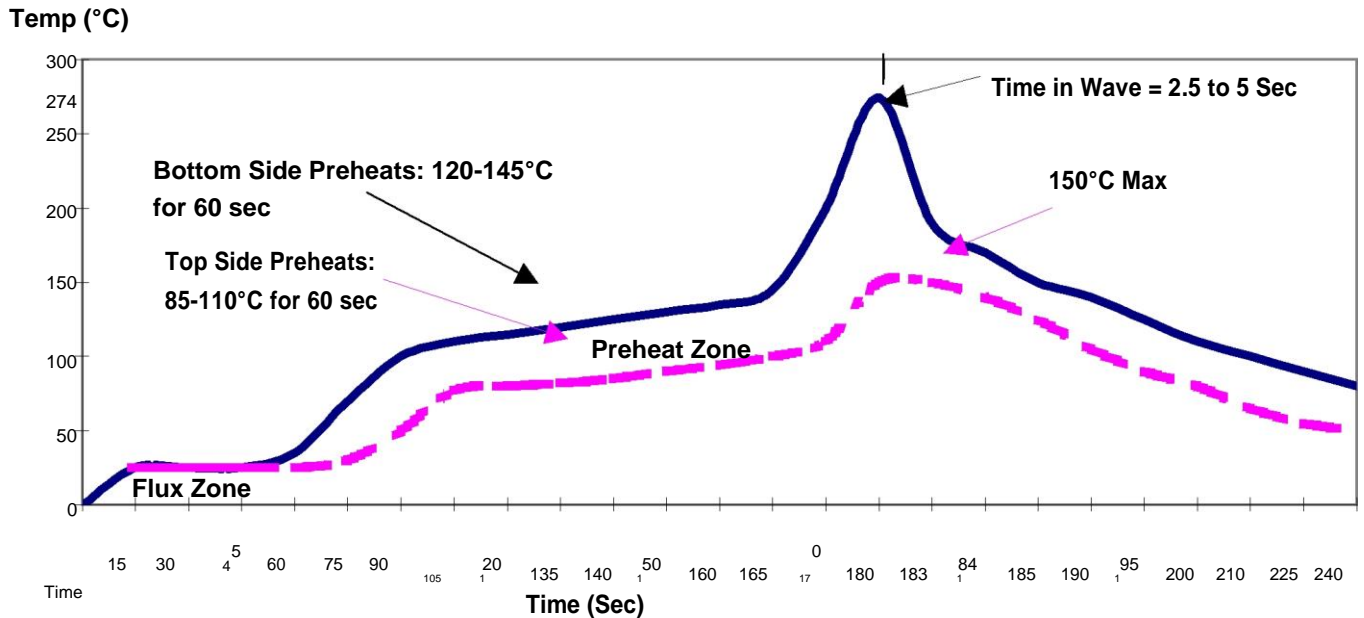
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TYPICAL Lead Free Wave Solder Profile (SNAGCU)



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 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.

PACKAGING

1L
2.5L
10L

CLEANING

399-42 is a no clean formulation; therefore, residue removal is not required for typical applications. If residue removal is desired, the use of Everklean 1005 Buffered Saponifier with a 5-15% concentration in hot 60° C (140° F) will aid in residue removal.

STORAGE & SHELF LIFE

399-42 No Clean Liquid Flux should be stored in a 65-80°F in a cool, dry environment. Shelf life is 2 years from date of manufacture.

DISPOSAL

399-42 contains hazardous ingredients, therefore, should be disposed of in accordance with federal, state and local authority requirements.

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