

QUALITEK® 391S NO CLEAN FLUX

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Description

Qualitek® 391S is a No Clean, halogen-free, low solids flux designed for wave soldering processes or surface mount PCB assemblies. 391S exhibits excellent wetting and fluxing activities. The advantage of the flux containing low solids is there is essentially no residue remaining on the assembly after soldering. 391S eliminates the expense of cleaning with no surface insulation resistance degradation. 391S may be used for both leaded and lead-free applications.

Main Features

- 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	ORL0	IPC-J-STD-004B
Color and Appearance	Colorless Liquid	
Copper Mirror	Pass	IPC-TM-650 2.3.32
Corrosion Test	Pass	IPC-TM-650 2.6.15
SIR	1.20×10^{11} ohms	IPC-TM-650 2.6.3.3
Specific Gravity (g/cm³) @ 25°C±1 °C	0.797 ± 0.007	J-STD-004B
Solids, % (by Wt.)	2.0 ± 0.5	
Acid Number (mgKOH/g)	16.0 – 20.0	Titration

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Applications

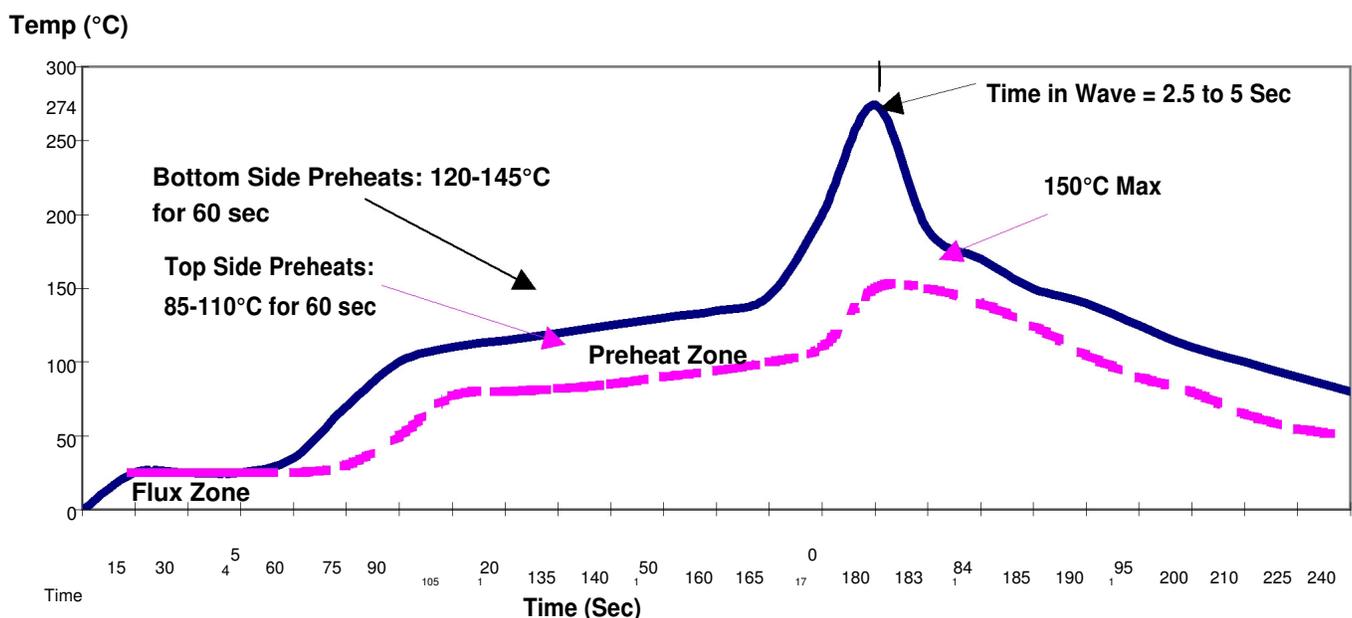
Flux Application

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.

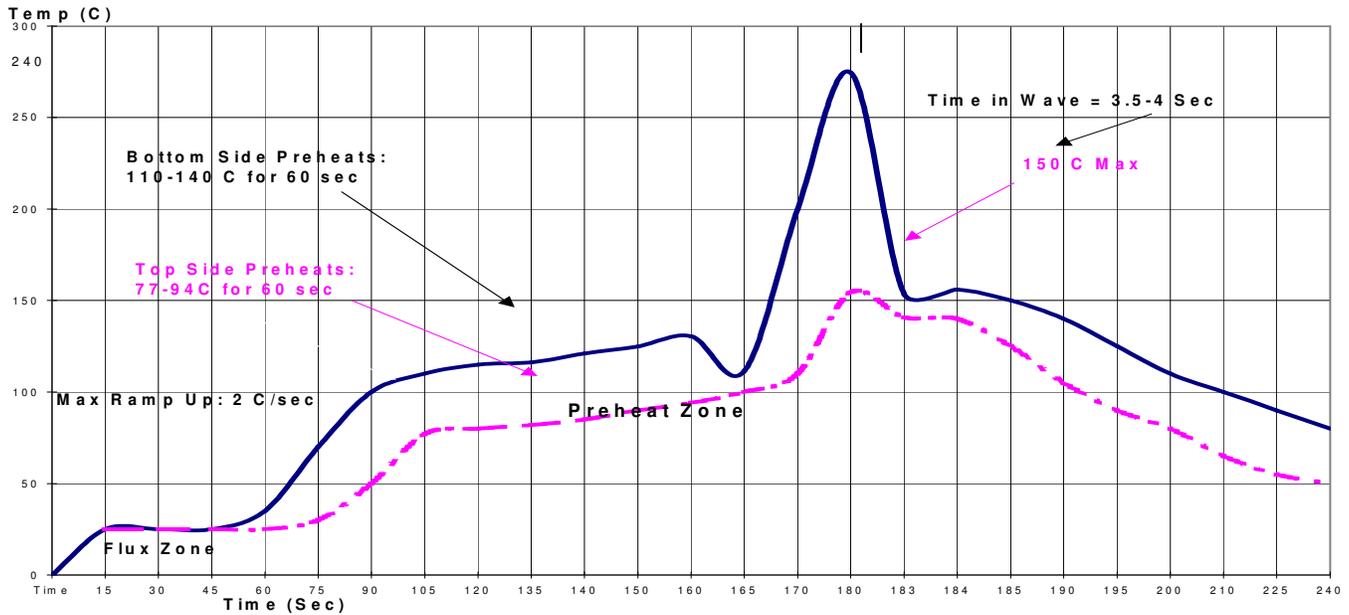
Uniformity of the spray flux coating can be visually checked by running a tempered glass plate (usually supplied by machine manufacturer) through the spray and preheat sections, and inspected before going across the wave.

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)

TYPICAL Lead Free Wave Solder Profile (SNAGCU)



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.

Cleaning

391S 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 Everklean 1005 Buffered Saponifier with a 5-15% concentration in hot 60 °C (140 °F) will aid in residue removal.

Storage & Shelf Life

391S 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.

Packaging

391S No Clean Liquid Flux is available in

- 1 Gallon/1 Liter containers
- 5 Gallon/5 Liter containers
- 55 Gallon/20 Liter containers

Disposal

391S contains hazardous ingredients therefore the flux should be disposed of in accordance with federal, state, local & federal authority requirements.

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