

Qualitek 737N WATER SOLUBLE NEUTRAL FLUX

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Physical Properties

Qualitek has developed 737N, which is a neutral, water removable liquid soldering flux for wave soldering of conventional and surface mount PCB assemblies. The organic activating system in 737N has a neutral pH at room temperature and becomes activated at soldering temperatures. 737N is formulated to be effective over a broad preheat range and may be used for both leaded and lead-free applications.

Main Features

- Excellent wettability
- Neutral pH
- Compatible with both leaded and lead-free solder systems
- Yields bright, shiny joints

Flux Classification	Specification	Test Method
	ORH1	JSTD-004
Color and Appearance	Clear Liquid	
Copper Mirror	Complete removal of copper film	IPC-TM-650 2.3.32
Corrosion (cleaned)	Pass	IPC-TM-650 2.6.15
SIR		
JSTD-004	1.80×10^{10} ohms	IPC-TM-650 2.6.3.3
pH	6.8 – 7.8	IPC-TM-650 2.3.13
Specific Gravity	0.846 ± 0.006	
Solids Content	16.5 – 18.5	IPC-TM-650 2.3-34
% Halides	2.2 ± 0.3	

Applications

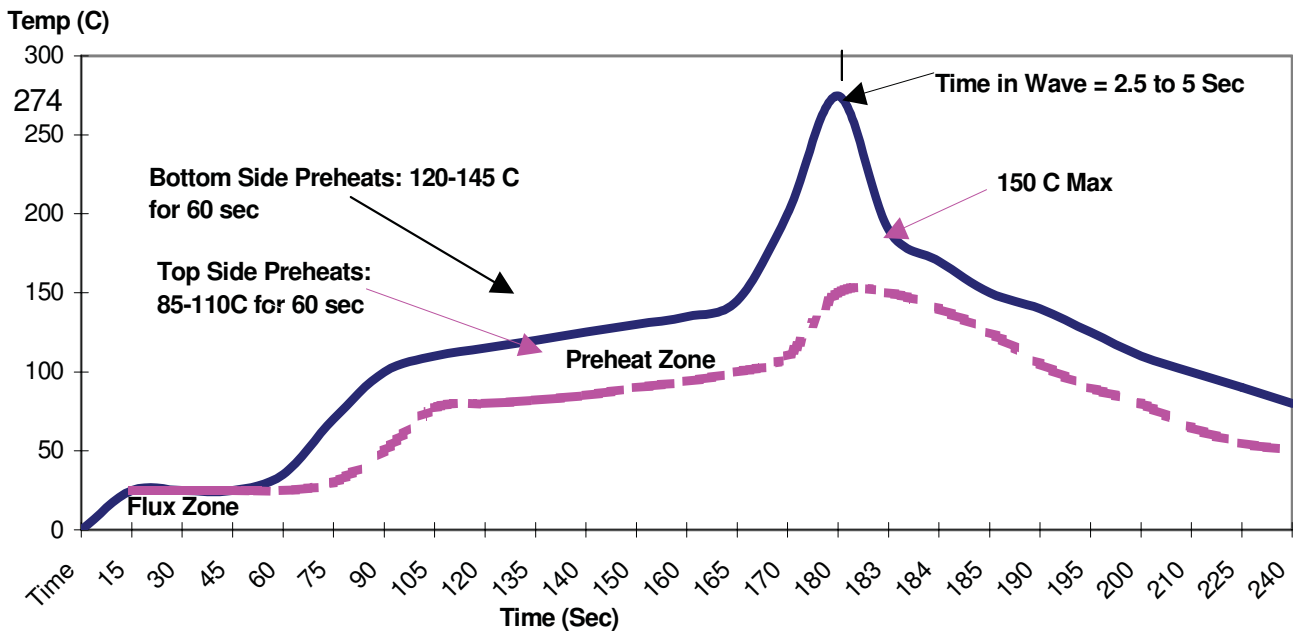
Flux Application

For mass wave soldering of bare copper and plated circuit boards, spraying, or wave fluxing can be utilized to apply this flux. Flux deposition density and uniformity are critical to successful use of water soluble 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 foam 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.

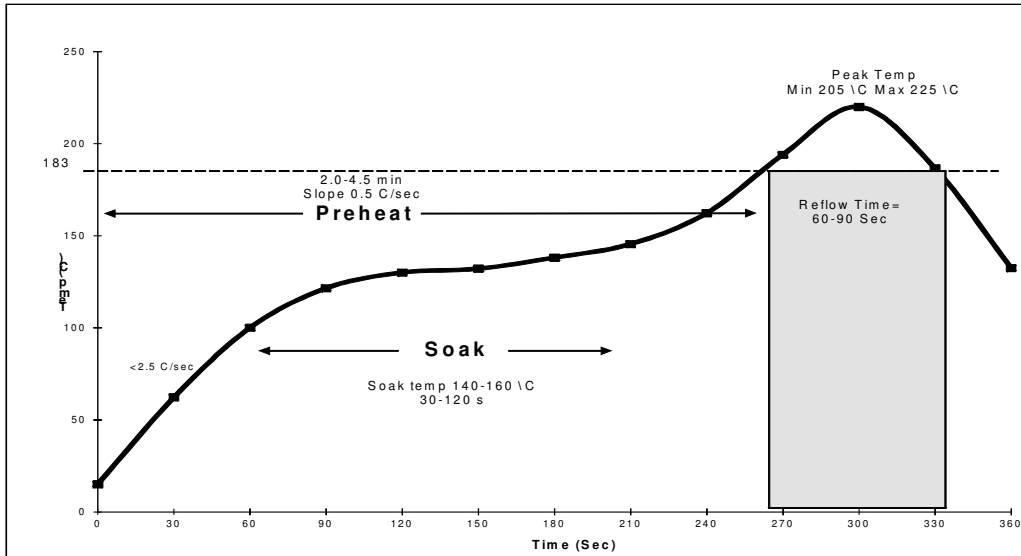
If spray fluxing, the uniformity of the coating can be visually checked by running a tempered glass plate (usually supplied by machine mfr.) through the spray and preheat sections.

OPERATING PARAMETERS		TYPICAL LEVEL
Amount of flux		Foam, Wave: 1000-2000 ug/in ² solids Spray: 750-1500 ug/in ² solids
Foam Fluxing Parameters		
	Foam Stone Pore Size	20-50 um
	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)



TYPICAL Leaded Wave Solder Profile (Sn63/Pb37)



Preheat Zone- The preheat zone, is also referred to as the ramp zone, and is used to elevate the temperature of the PCB to the desired soak temperature. In the preheat zone the temperature of the PCB is constantly rising, at a rate that should not exceed 2.5 C/sec. The oven's preheat zone should normally occupy 25-33% of the total heated tunnel length.

The Soak Zone- normally occupies 33-50% of the total heated tunnel length exposes the PCB to a relatively steady temperature that will allow the components of different mass to be uniform in temperature. The soak zone also allows the flux to concentrate and the volatiles to escape from the paste.

The Reflow Zone- or spike zone is to elevate the temperature of the PCB assembly from the activation temperature to the recommended peak temperature. The activation temperature is always somewhat below the melting point of the alloy, while the peak temperature is always above the melting point.

Process Control

Control of flux during use is necessary to assure a consistent amount of flux is applied to assemblies. Monitoring and controlling specific gravity is recommended for maintaining the proper flux concentration. Density (specific gravity) can be performed using a hydrometer. Control of the flux can be achieved with 700 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.

#737N Flux	
Specific Gravity	Thinner Required Fl oz/ga
0.846	0
0.849	6
0.853	12
0.856	17
0.859	22
0.863	26

Cleaning

As with all water-soluble fluxes, post-soldering cleaning is required. Residues can be easily removed with both hot and cold water, thus; no neutralizer is needed. De-ionized water should be used in the final rinse for cleanliness results beyond MIL-28809A. Spray pressures so be maintained at 20-30 psi and conveyor speed of 3-6ft/min.

Storage & Shelf Life

Liquid Fluxes storage should be in a 65-80 °F environment away from direct heat and flame. When directly handling liquid solder flux, it is recommend to use appropriate gloves. Solder flux shelf life is 2 years from date of manufacture.

Disposal

737N contains hazardous ingredients; therefore, the flux should be disposed of in accordance with state & local authority requirements.

Packaging

737N Water soluble Flux is available in

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