LIQUID FLUX WF305F, WF305S

VOC-free and no-clean. High activity, Special Low Solder-Balling Formula

DESCRIPTION

Stannol WF305F and WF305S are low residue, resin and halide free fluxes which meet the most demanding legislation on volatile organic compound (VOC) emission during use.

CHARACTERISTICS

Stannol WF305F/S offers the following advantages:

- **No-Clean**
- **Residues may be washed in water if required**
- **Non-flammable formulation - <1% VOC - meets air quality legislation**
- **Suitable for clean copper or tin/lead substrate**

APPLICATION

Recommended for consumer electronics, telecommunications and for professional applications using conventional wave soldering machines or units with nitrogen inerted waves.

RECOMMENDED OPERATING CONDITIONS

The Printed Circuit Board: Stannol WF305F/S are designed for optimum wetting of surfaces and are not aggressive towards common plastics. Stannol WF305F/S have been formulated for high activity on clean copper and are effective on tin/lead coated boards.

Machine Preparation: When switching to WF305F or WF305S from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned. It is recommended that Stannol Flux-Ex 500 or Stannol Flux-Ex 200/B are used in the finger cleaners.

Fluxing: Stannol WF305S has been formulated for use in spray or wave fluxers in the same way as ordinary fluxes on standard wave soldering machines. WF305F has been formulated for use in foam fluxers.
The upper limit for flux coverage to ensure that soldered PCBs pass cleanliness tests is 40g m-2 of circuit. Good soldering can be achieved at half this volume.

Flux Control: Since loss of solvent by evaporation is slow and moisture absorption does not occur, flux maintenance is simpler than for alcohol formulations. Density measurements do not give a reliable guide to flux activity since changes are small and difficult to detect. The Stannol Mini-Titration-Kit is recommended for routine control at the production line.

Note: Stannol WF305F/S fluxes should not be stored below +10°C (longtime-storage). For a short time +5°C is possible. Lower temperatures may cause the solids in the flux to separate from solution. Warming to room temperature and gentle agitation will restore the fluxes to normal.

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Preheating: WF305F/S contain significant quantities of water, it will be necessary to adjust the preheater setting to remove the solvent and to ensure that the flux is properly activated. The optimum preheat temperature and time for a PCB depends on its design and the thermal mass of the components, the cycle should be sufficient to ensure that the flux coating is not visibly wet when it contacts the wave. A combination which has given good results is shown below.

Conveyor Speed:	m/min.$^{-1}$	1.5
Topside Preheat:	(°C)	110

Wave Soldering: It is advantageous to fit a topside canopy over the preheaters to produce more effective drying and activation. This will allow the use of faster conveyor speeds and improve soldering. At a speed of 1.5m min-1, a contact length of 38-50mm between the wave and the PCB is recommended. At lower speeds, this contact length should be reduced. Very slow speeds through the solder wave may produce dull solder joints.

It is particularly useful when setting up a machine to measure the preheat using the Stannol Thermologger 5000 temperature profile system.

It is important that flux solvent be removed by the preheat and that the PCB is not visibly wet when it reaches the solder wave.

Solders: Stannol WF305F/S fluxes can be used with all standard solder alloys. The recommended maximum solder bath temperature is 260°C (500°F). The solder bath temperature can generally be reduced compared with processes using conventional fluxes. Temperatures as low as 235°C (455°F) may be used in some situations and this results in improved soldering and less wastage through drossing. Dwell time on the wave should be 1.5-2.5 seconds.

Cleaning: It is recommended that the soldering system itself is tested for cleanliness using an unfluxed board passed over the soldering machine. Suppliers should be requested to supply clean components and clean boards.
Special applications may have regulations insisting on board cleaning and in such cases hot water or Stannol Flux-Ex 500 may be used. Flux-Ex 500 is free from ozone depleting chemicals and may also be used to remove any small accumulation of flux solids that might develop on parts of the soldering machine after prolonged use. Machine contamination will in any case be much less than with conventional rosin fluxes since the main component of the flux is water. Stannol WF305F/S fluxes may be slightly corrosive towards some metal PCB handling equipment.

PHYSICAL PROPERTIES AND DATA

GENERAL PROPERTIES	**WF300F** (Foam)	**WF300S** (Spray)
J-STD-004 classification:	OR M0	
EN 29454 classification:	2.1.3	
Colour[(1)]:	colourless/yellow	
Solids content:	2.6% ± 0.3w/w	2.1% ± 0.3w/w
Halide content:	Zero	
VOC content:	0.4%	0.1%
Acid value (on liquid) mg KOH g^{-1}:	21 ± 1	21 ± 1
Specific gravity at 25°C (77°F):	1.007 ± 0.002	1.006 ± 0.002

(1) Some yellowing of the flux may occur during storage or prolonged exposure to light. This does not affect performance.

Surface Insulation Resistance: Stannol WF305F/S liquid fluxes gave the PASS results shown in the following table during SIR tests.

SURFACE INSULATION RESISTANCE MEASUREMENTS ON UNCLEANED COMBS						
Specification:	Alterungsbedingungen					Typical SIR (Ohm)
	Temp (°C)	Humidity (%)	Time (h)	Voltage (V)	Test-Voltage (V)	
Bellcore TR-NWT-000078:	35	85	96	50	100	**WF305S**
						$2,7 \times 10^{12}$
J-STD-004:	85	85	168	50	100	**WF305F**
						$2,3 \times 10^{10}$
						WF305S
						$2,2 \times 10^{10}$

Electromigration: Stannol WF305S liquid flux gave the PASS results shown in the following table during electromigration testing to Bellcore TR-NWT-000078: 500h at 10V bias, 85°C and 85% RH.

TEST CONDITION	INITIAL SIR (OHMS)	AGED SIR (OHMS)
Control:	$1,9 \times 10^{10}$	$2,4 \times 10^{10}$
Preheated, unsoldered:	$1,5 \times 10^{10}$	$2,3 \times 10^{10}$
Soldered, uncleaned:	$1,6 \times 10^{10}$	$2,6 \times 10^{10}$

Corrosion: Stannol WF305F/S pass the copper mirror test described in IPC-TM- 650, Test Method 2.3.32 when the flux formulation is reconstituted with 2-propanol,after the evaporation of its flux vehicle at 80°C,as permitted by J-STD-004, Table 5.

SHELF LIFE

1 year after date of delivery (provided proper storage in originally sealed container).

HEALTH AND SAFETY

Before using please read the material safety data sheet carefully and observe the safety precautions described.

NOTICE