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Laboratory Data Sheet

Product X32FQ/1

Electronics Version, March, 2003

NO CLEAN, HALIDE FREE LIQUID FLUX

PRODUCT DESCRIPTION

Multicore X32FQ/1 is a superior no clean, halide free liquid flux particularly for copper finishes from the pioneers of "no clean" technology.

- **Fast soldering on conventional leaded and SMD components - shiny joints; no bridges or icicles**
- **Resin-/rosin-free to give clean appearance to soldered PCB**
- **No cleaning - reduces costs and eliminates CFC usage**
- **Minimal residues to interfere with ATE probes without cleaning**
- **Compatible with rosin based surface preservatives**
- **Foam application**

TYPICAL APPLICATIONS

Multicore X32FQ/1 is recommended for consumer electronics and general electrical soldering applications. It has been formulated without resin/rosin to give a very clean appearance to PCBs.

TYPICAL PROPERTIES

The following table contains typical product data. A full description of test methods and detailed test results are available on request.

General Properties	X32FQ/1
Color	Colorless
Smell	Alcoholic
Solids content	4.6 %
Halide content	Zero
Acid value (on liquid) mg KOH/g	17
Specific gravity at 25°C (77°F)	0.815
Flash point (Abel)	12°C (53°F)
IPC Classification	L3CN
J-STD-004	RELO

TYPICAL RELIABILITY PROPERTIES

Multicore X32FQ/1 flux passes the following corrosion tests:

USA Copper Mirror Test per MIL-F-14256D

UK Ministry of Defence DTD 599A

BS 5625 Flux Class 4

Multicore X32FQ/1 liquid flux gave the PASS results shown in the following table during surface insulation resistance tests.

Surface Insulation Resistance Measurements on Uncleaned Soldered Combs

Specification	Temp °C	Ageing Conditions			Test Voltage V	Typical SIR ohms
		Relative Humidity %	Time hr	Voltage V		
Bellcore TR-NWT-000078	35	85	96	50	100	1.4 x 10 ¹¹
J-STD-004	85	85	168	50	100	1.2 x 10 ⁹

Electromigration

Multicore X32FQ/1 passes the electromigration test requirements of Bellcore TR-NWT-000078 at 10V bias for 500 hr at 85°C and 85% RH.

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

Directions for Use

The Printed Circuit Board: Multicore X32FQ/1 is recommended for use on clean copper or tin-lead coated PCBs. Multicore X32FQ/1 is particularly effective on bare, passivated or lacquered (resin-coated) copper circuit boards. It may also be used on tin/lead coated boards.

Low residue fluxes generally produce poor through-hole filling, particularly on copper finishes. Multicore X32FQ/1 has been formulated to overcome this problem.

Machine Preparation: When switching to Multicore X32FQ/1 from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned.

It is recommended that Multicore Prozone Solvent Cleaner is used in the finger cleaners.

Fluxing: Multicore X32FQ/1 has been formulated for use in foam fluxers in the same way as ordinary fluxes on standard wave soldering machines. It is important to remove excess flux from the circuit boards using the standard air knife or brushes supplied on the wave soldering machine. An air pressure of about 5-7psi is recommended and the nozzle should be about 25mm below the board and angled back at a few degrees to the perpendicular to the plane of the board. This will ensure effective removal of excess flux without transferring droplets to the top of the following board.

Flux Control: Control of the flux concentration can be achieved in the conventional manner by measuring temperature and specific gravity. However, as the specific gravities of the flux and thinners are similar and will vary with water content, flux concentration control by measurement of acid value is more convenient and accurate.

Preheating: The optimum preheat temperature and time for a PCB depend on its design and the thermal mass of the components but the cycle should be sufficient to ensure that the flux coating is not visibly wet when it contacts the wave.

Conditions will vary from one machine to another but the following settings were found to give good results on a number of systems:

CONVEYOR SPEED	Ft min ⁻¹	3	4	5
	m min ⁻¹	0.91	1.22	1.52
TOPSIDE	°C	80-100	70-110	70-100
PREHEAT	°F	176-212	158-230	158-212

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 Multicore SoldaPro Temperature Profile System (data sheet available).

IT IS IMPORTANT that flux solvent be removed by the preheat and that the PCB **IS NOT WET** when it reaches the solder wave.

Solders: Multicore X32FQ/1 flux can be used with all 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 dressing. Dwell time on the wave should be 1.5-2.5 seconds. Conveyor speed for dual wave systems should be at least 1.2m min⁻¹.

To complete your no-clean assembly, use the compatible Multicore No Clean Solder Wire and No Clean Solder Paste. Soldering iron tips should be kept clean with Multicore Tip Tinner/Cleaner TTC1 (data sheet available).

Cleaning: Special applications may have regulations insisting on board cleaning and in such cases Multicore Prozone Solvent Cleaner should be used. This is an economic cleaner which is free from CFC compounds and may 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. Unlike water soluble fluxes, Multicore X32FQ/1 flux is not corrosive towards PCB handling equipment.

Storage: Product shall be ideally stored in a cool, dry location away from direct sunlight in unopened containers at a temperature between 10° and 30°C (54° to 86°F) unless otherwise labeled. Optimal storage is 20° and 25°C (68° to 77°F). To prevent contamination of unused product, do not return any material to its original container. Shelf life information is listed on the product label.

Shelf Life: The shelf life of X32FQ/1 is 2 years when stored as recommended in the original container.

Storage: Product shall be ideally stored in a cool, dry location away from direct sunlight in unopened containers at a temperature between 10° and 30°C (54° to 86°F) unless otherwise labeled. Optimal storage is 20° and 25°C (68° to

77°F). To prevent contamination of unused product, do not return any material to its original container. Shelf life information is listed on the product label.

X32FQ/1 is classified as **FLAMMABLE** (as determined by OSHA) and must be stored in compliance with relevant regulations. Do not store near oxidizing agents or sources of ignition.

Data Ranges

The data contained herein may be reported as a typical value and/or range. Values are based on actual test data and are verified on a periodic basis.

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Loctite Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign