Product Data Sheet

X33-08i

August 2007

N0 CLEAN, HALIDE FREE SUSTAINED ACTIVITY FLUX

Multicore X33-08i is a resin free, no clean, halide free liquid flux for surfaces with poor solderability from the pioneers of "no clean" technology.

- **Fast soldering on conventional leaded and SMD components - shiny joints; no bridges or icicles**
- **Sustained activity for maximum process window**
- **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, spray or wave application**

APPLICATIONS

Multicore X33-08i 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.

RECOMMENDED OPERATNG CONDITIONS

The Printed Circuit Board: Multicore X33-08i is recommended for use on clean copper or tin-lead coated PCBs. It will solder satisfactorily over most rosin-based preservatives. It is recommended that the rosin based preservative be applied no longer than 3 months before soldering, since the period of protection is limited dependent on storage conditions.

Multicore X33-08i has been formulated to work over a wide range of solder resists. The solvent system in Multicore X33-08i is designed for optimum wetting of surfaces but prolonged contact with polystyrene, PVC or polycarbonate is not recommended.

Machine Preparation: When switching to Multicore X33-08i from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned.

It is recommended that Multicore MCF800 Solvent Cleaner be used in the finger cleaners.

Fluxing: Multicore X33-08i has been formulated for use in foam, spray or wave 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. Sufficient space should be allowed between the foam fluxer and the air knife to prevent the air stream disturbing the foam.

Observing the following instructions will help ensure optimum foaming and soldering results.

1. Use **DRY AIR**.
2. Keep the flux tank **FULL** at all times.
3. The top of the foaming stone should be no more than 20mm below the surface of the liquid flux. A fine foaming stone is preferred and if necessary, raise the level of the stone.
4. The preferred width of the slot (opening) of the foam fluxer is 10mm. If it is wider and problems are encountered, add a strip of stainless steel or PVC across it to narrow the opening to 10mm. It is preferable to have a chimney for the foam which tapers towards the top.
5. **DO NOT** use hot fixtures or pallets as these cause the foam to deteriorate and increase losses by evaporation.
6. **DO NOT** use fixtures that have the potential to entrap flux.

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.

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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}	4	5
	m min^{-1}	1.22	1.52
TOPSIDE PREHEAT	°C	80 - 85	90 - 95
	°F	176 - 185	194 - 203

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

Solders: Multicore X33-08i 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 drossing. 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 Cored Solder Wire and Solder Paste.

Soldering iron tips should be kept clean with Multicore Tip Tinner/Cleaner (data sheet available).

Cleaning: Special applications may have regulations insisting on board cleaning and in such cases Multicore MCF800 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 X33-08i flux is not corrosive towards PCB handling equipment.

TECHNICAL SPECIFICATION

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

General Properties	X33-08i
Colour	Colourless
Smell	Alcoholic
Solids content	1.6%
Halide content	Nil
Acid value (on liquid) mg KOH/g	17.5
Specific gravity at 25°C (77°F)	0.800
Flash point (Abel)	12°C (53°F)
Thinners	PC70i
J-STD-004	OR L0
EN 29454	2.2.3

SPECIAL PROPERTIES

Multicore X33-08i 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

SURFACE INSULATION RESISTANCE

Multicore X33-08i 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	4.4×10^{11}
J-STD-004	85	85	168	50	100	3.4×10^{10}

ELECTROMIGRATION

Multicore X33-08i 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).

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, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel 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 Henkel 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 patents or patent applications.

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