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 X32-10m 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 4ft/min.

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

Cleaning: Multicore X32-10m flux properly applied and processed leaves no discernible residues without cleaning.

It is recommended that the soldering system itself be tested for cleanliness using an unfluxed board passed over the soldering machine. Suppliers should be requested to supply clean components and clean boards with good solderability.

Special applications may have regulations insisting on board cleaning and in such cases Prozone or PC83-02 Solvent Cleaner should be used. These are economic cleaners which 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 X32-10m flux is not corrosive towards PCB handling equipment.

TECHNICAL SPECIFICATION

A full description of test methods and detailed test results are available on request. The results below are typical, a full specification is available on request.

General Properties	X32-10m	X732-10m
IPC Classification	M3CN	-
Color	Colorless	Colorless *
Smell	Alcoholic	Alcoholic *
Solids content	2.3% ± 0.5 w/w	-
Halide content	Zero	Zero
Acid value (on liquid) mg KOh/g	15.5 ± 0.5	0.3
Specific gravity	0.817 ± 0.002	0.786 ± 0.002
Flash point (Abel)	11-12°C (51-53°F)	11-12°C (51-53°F)
Autoignition point	>455°C (850°F)	>455°C (850°F)
Thinners	X732-10m	-

SPECIAL PROPERTIES

Boards soldered with Multicore X32-10m flux pass MIL-P-28809 ionic contamination test without cleaning provided excess flux is not applied and a clean system and components are used.

Patents granted or pending worldwide

Multicore X32-10m flux passes the following corrosion tests:

USA Copper Mirror Test per MIL-F-14256E

UK Ministry of Defence DTD 599A

USA Bellcore TR-TSY-000078

USA Bellcore TR-NWT-000078

Multicore X32-10m liquid flux gave the PASS results shown in the following table during surface insulation resistance tests.

Surface Insulation Resistance Measurements on Uncleaned Combs

Specification	Ageing Conditions				Test Voltag V	Typical SIR ohms
	Temp °C	Relative Humidity %	Voltage V	Time hr		
Bellcore TR-TSY-000078	35	90	50	96	100	6.5×10^{10}
Bellcore TR-NWT-000078	35	85	50	96	100	3.4×10^{11}
IPC-SF-818	85	85	50	168	100	3.11×10^{9}
JIS-Z-3197	40	90	None	96	500	5.2×10^{10}

Conformal Coatings

Extended surface insulation resistance tests using conformally coated IPC-B-25 test combs were carried out at 40°C and 90% RH and a test voltage of 500V. The following table shows that conformal coatings perform well over uncleaned X32-10m residues compared with the same coatings over cleaned, unfluxed boards.

Flux Type	Conformal Coating Type	Surface Insulation Resistanc (ohms) after 168 hours
None X32-10m	Acrylic	1.75×10^{9} 1.04×10^{9}
None X32-10m	Modified silicone	2.13×10^{9} 1.29×10^{9}

HEALTH AND SAFETY

The following is intended for general guidance only. Health and Safety Data Sheets which contain more comprehensive information are available.

Multicore X32-10m liquid flux is safe to use provided that certain precautions are observed:

Fumes/Vapors and Precautions: Inhalation of the solvent vapors will lead to toxic effects including headaches, nausea, convulsions and can cause damage to the eyes, heart, liver and kidneys and should be avoided. Multicore X32-10m liquid flux must always be used in well ventilated areas.

Protection and Hygiene: Suitable protective clothing should be worn to prevent the material from coming into contact with the skin and eyes. Eating and drinking should not be permitted in the working area and hands should be washed thoroughly with soap and warm water before eating.

Fire Hazards and Precautions: Multicore X32-10m liquid flux contains a highly flammable solvent with a flashpoint of 11-12°C (51-53°F). The material must not be used near naked flames or non-flameproof electrical equipment. Smoking must not be permitted in the working area. Carbon dioxide, alcohol resistant foam or dry powder extinguishers should be used if the material catches fire.

U.K. & World Headquarters: Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RQ. Tel: +44 (0) 1442 233233 Fax: +44 (0) 1442 69554 Telex: 82363 KELSEY G.

AUSTRALIA: 2 Hume Road, Smithfield, NSW 2164. Tel: (02) 725-1277 Telex: AA 176434MSAP Fax: (02) 725-2896.

CHINA: 135#-4 Longjiang Road, Xia Guan District, Nanjing 210011. Tel: (025) 8755568 Fax: (025) 8751678

CANADA: 12,320 April, Montreal, Quebec, H1B 5N5. Tel: (514) 645-2375 Fax: (514) 645-7574.

GERMANY: Postfach 20 12 45, 42212 Wuppertal. Tel: 0202-585166 Telex: 8591330 Fax: 0202-585111.

JAPAN: Hakua Building, 2-4-1 Akasaka, Minato-ku, Tokyo 107. Tel: 03-3586-8045 Telex: 2426738 HICON J Fax: 03-3586-5669.

MALAYSIA: Lot 62049 Jalan Portland, Tasek Industrial Estate, 31400 Ipoh. Tel: 05-5476811 Telex: SOLDER MA 44059 Fax: 05-5471868.

SINGAPORE: No. 2, Corporation Road, Unit #06-15, Corporation Place, Singapore 618494. Tel: 2614766/2614768 Fax: 2615455.

TAIWAN: Multicore Soldering Technology, No.22, Lane 57, Nan-Yang Street, Shih-Jyy Town, Taipei Hsien, R.O.C. Tel: (02) 694-5418 Fax: (02) 694-2434.

U.S.A.: 1751 Jay Ell Drive, Richardson, Texas 75081. Tel: 972-238-1224 Telex: 792451 Fax: 972-437-0288.

MSI Ref: X3210m 2/94

NO RESIDUE FLUX

HALIDE-FREE X32-10M

Multicore X32-10m is a no residue halide free flux with a wider operating window from the pioneers of 'no clean' technology.

- **Easy to use**
- **Unique patented synthetic resin formulation**
- **Fast soldering on conventional leaded and SMD components - no bridges or icicles**
- **No cleaning - reduces costs and eliminates CFC/ODC usage**
- **Non corrosive - safer than RMA fluxes**
- **High surface insulation resistance - without cleaning**
- **No residues to interfere with ATE probes without cleaning**
- **Meets Bellcore TR-NWT-000078 and MIL-P-28809 specifications**

APPLICATIONS

Recommended for consumer electronics and telecommunications use and for professional applications with conformal coatings. Different solvent carrier blends may be available to meet local conditions and will be specified by a different suffix (eg. X32-10i).

RECOMMENDED OPERATING CONDITIONS

The Printed Circuit Board: Multicore X32-10m is recommended for use on clean copper or tin-lead coated PCBs. Specifying the use of proprietary passivation treatments for clean copper will ensure better soldering and excellent post-soldering cleanliness. Multicore X32-10m will solder satisfactorily over most rosin-based preservatives, but the rosin residues from the preservative will reduce board cleanliness unless cleaning is employed. It is recommended that the rosin based preservative be applied no longer than 3 months before soldering with X32-10m.

Multicore X32-10m has been formulated to work over a wide range of solder resists. The solvent system in Multicore X32-10m is designed for optimum wetting of surfaces, but prolonged contact with polystyrene, polyester, PVC or polycarbonate is not recommended.

Machine Preparation: When switching to X32-10m from any other flux, ensure all fingers, pallets and conveyors are thoroughly cleaned. It may be necessary to steam clean the equipment to remove all residues.

It is recommended that Prozone or PC83-02 Solvent Cleaner be used in the finger cleaners.

Fluxing: Multicore X32-10m has been formulated for use in **foam, spray** or **wave fluxers** in the same way as ordinary fluxes on standard wave soldering machines. The upper limit for flux coverage to ensure that soldered PCBs pass MLI-P-28809 cleanliness tests is 25g/m^2 of circuit. Good soldering can be achieved at half this volume. 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 2.5cm 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 2cm 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, add a strip of stainless steel 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 is achieved in the normal manner by measuring the temperature and specific gravity of the flux. A nomograph is available to show how these measurements are related to the corrective action needed.

The specific gravities of the flux and thinners are similar and they vary with their water contents. As a result, flux concentration control by measurement of the acid value is more convenient. The Multicore SCK001 test kit for use on the production line is available.

Preheating: As X32-10m contains more solvent than conventional fluxes, it will be necessary to increase the preheater setting to remove the additional 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, but the cycle should be sufficient to ensure that the flux coating is not visibly wet when it contacts the wave.

The combination of very low resin content and special solvent blend produce a wider operating window compared with other low solids content liquid fluxes. 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	4	5	6
	M/Min	1.22	1.52	1.83
TOPSIDE PREHEAT	°C	79-90	90-99	96-104
	°F	175-195	195-210	205-220

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. Very slow speeds through the solder wave may produce dull solder joints.