



Product X39

April 2003

NO CLEAN CORED SOLDER WIRES

Multicore X39 Low Residue Solid flux has been specially formulated to complement no clean wave and reflow soldering processes. It is also applicable to repair operations following a cleaning process to eliminate the need for further cleaning.

- Eliminates cost of cleaning
- Halide free
- Non-corrosive formulation
- Negligible residues
- Fast Soldering on copper and brass

PRODUCT RANGE

Multicore X39 cored wires are manufactured as standard with a nominal flux content of 1% and are available in alloys Sn60 and Sn62 conforming to J-STD-006 and EN 29453 or alloys conforming to similar national and international standards and 99C lead-free alloy. A wide range of wire diameters is available presented on reels or other convenient packaging formats.

Alternative flux contents and alloys may be manufactured to special order.

RECOMMENDED OPERATING CONDITIONS

Soldering Iron: The optimum tip temperature and heat capacity required for a hand soldering process is a function of the design of the iron and the task. However, unnecessarily high tip temperatures for excessive times should be avoided and good results can be obtained with a tip temperature of 340-420°C (650-780°F).

The tip of the soldering iron should be properly tinned and this may be achieved with Multicore X39 cored wire. However, this does depend on the initial condition of the tip. If it is in poor condition, it may be more effective to pre-tin the tip with Multicore Tip Tinner/Cleaner TTC1. Used correctly, this cleaner will leave the iron tip well tinned and free from any harmful residues which might be transferred to the work piece. Where tip preparation is required use the following procedure:

- a) With the soldering iron at operating temperature, tin the new tip by gently rubbing the working surface over TTC1.
- (b) Wipe the tip on a clean, damp sponge to remove any excess solder.
- (c) Re-tin the tip of the iron with Multicore X39 flux cored wire.

It is not necessary to re-use Multicore TTC1 on iron tips once they have been correctly tinned.

Soldering Process: Multicore X39 flux cored wires contain a careful balance of resins and activators to provide minimal residues and high reliability without cleaning. Some adjustment to operator practices may be required to gain the maximum advantages from the product but the principles of normal hand soldering still apply. The process should be as follows:

- (a) Apply the soldering iron tip to the work surface. The iron tip should contact both the base material and the lead at the same time to heat both surfaces properly. The excess solder on the iron tip will assist in the heating process by forming a larger contact area between the base material and the lead. It should take no more than a fraction of a second to heat both surfaces adequately.
- (b) At this time the X39 flux cored wire should be applied to a part of the joint surface away from the soldering iron and allowed to flow to form the joint fillet. This should take about ½ second.

Note: If the solder is applied directly to the soldering iron tip, the flux may be overheated and its effectiveness diminished.

Do not apply excessive solder to the joint, as this will leave excess flux residues on the surface.
- (c) Remove solder from work piece and then remove the heat source (iron tip).

This total process should take from ½ to 1½ seconds per joint, depending upon mass, iron temperature and tip configuration, along with the solderability of the surfaces. Excessive times or temperatures may exhaust the flux before solder wetting has occurred and may cause increased residue levels.

Cleaning: Multicore X39 flux cored wires have been formulated to leave minimal quantities of flux residue and to resist spitting and fuming. Cleaning will not therefore required in most situations so the product may be used to complement a no clean wave soldering or reflow process or to allow repair to cleaned boards without the need for a second cleaning process.

NOT FOR PRODUCT SPECIFICATIONS.
THE TECHNICAL INFORMATION CONTAINED HEREIN IS INTENDED AS REFERENCE ONLY. PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS.

Should cleaning be required, this is best achieved in Multicore Prozone. Other proprietary solvent or semi-aqueous processes may be suitable but cleaning by saponification is not recommended.

TECHNICAL SPECIFICATION

A full description of test methods and detailed test results are available on request.

Alloys: The alloys used for Multicore flux cored solder wires conform to the purity requirements of the common national and international standards. A wide range of wire diameters is available manufactured to close dimensional tolerances.

Flux: Multicore X39 solid flux is based on modified rosins and halide free carboxylic acid activators. In use it has a mild rosin smell and leaves a small quantity of clear residue. It may be classified as RO L0 according to J-STD-004 (January 1995), LR3CN according to IPC-SF-818 or DIN F-SW32 according to DIN 8511. It meets the requirements of Bellcore TR-NWT-000078 issue 3 (December 1991).

FLUX PROPERTIES		
TEST	RESULT	
Acid value	215-230mg KOH/g	
Halide content	Zero	
Copper mirror	Pass	
Chromate paper	Pass	
Corrosion Test	J-STD-004	Pass
	IPC-SF-818	Pass (10 days)
	BS 5625	Pass
	DTD 599A	Pass
	DIN 8516	Pass
	JIS-Z-3197	Pass

Cored Wire: Standard cored wire is available with a nominal flux content of 1.0%.

The uncleaned residues PASS SIR testing to the Bellcore TR-NWT-000078 issue 3 (December 1991) and IPC Class 1,2 and 3 protocols. They also pass the electromigration test specified by Bellcore TR-NWT-000078.

BELLCORE TR-NWT-000078 ISSUE 3 SIR TEST RESULTS ON UNCLEANNED COMBS		
Test conditions	35°C, 85% RH	
Test time, h	24	96
Surface insulation resistance, ohms	3.17 x 10 ¹¹	3.52 x 10 ¹¹
Passmark, ohms	-	10 ¹¹

Test time, h	0	24	96	168
Surface insulation resistance, ohms	1.63 x 10 ¹²	1.68 x 10 ⁹	3.37 x 10 ⁹	3.43 x 10 ⁹
Passmark, ohms	-	10 ⁸	10 ⁸	10 ⁸

BELLCORE TR-NWT-000078 ISSUE 3 ELECTROMIGRATION TEST RESULTS ON UNCLEANNED COMBS		
Test conditions	85°C, 85% RH	
Test time, h	96	500
Bias, V (DC)	No bias	10
Surface insulation resistance, ohms	1.16 x 10 ⁹	5.43 x 10 ⁹
Unfluxed control, ohms	5.09 x 10 ⁹	8.91 x 10 ⁹

HEALTH AND SAFETY

WARNING: The following information is for guidance only and users must refer to the Material Safety Data Sheets relevant to specific Multicore X39 products before use.

Fume Hazards and Precautions: Avoid excessive inhalation of the flux fumes. These are irritating to the throat and respiratory organs. Prolonged or repeated exposure may rarely result in sensitisation leading to occupational asthma. Suitable fume extraction equipment should be used to extract flux fumes away from operators.

Protection and Hygiene: Lead is harmful if absorbed into the body through the digestive system or skin. Eating, drinking and smoking should not be permitted in the working area. Hands should be washed with soap and warm water after handling solder, especially before eating.

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 patents or patent applications.

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IPC-SF-818
TS ON UNCLEANNED COMBS

MSL542

85°C, 85% RH