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# NO CLEAN CORED SOLDER WIRES

## X52

Multicore X52 Low Residue Solid flux has been specially formulated to complement no clean wave and reflow soldering processes where extra activity is required. It is also applicable to repair operations following a cleaning process to eliminate the need for further cleaning.

- Eliminates cost of cleaning
- Fast and sustained soldering on copper and brass
- Non-corrosive formulation
- Negligible residues

### PRODUCT RANGE

Multicore X52 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 are 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 X52 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 X52 flux cored wire.

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

**Soldering process:** Multicore X52 flux cored wires contain a careful balance of resins and activators to provide minimal residues, high activity and good 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 X52 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 0.5 second.

**Note:** If the solder is applied directly to the soldering iron tip, the flux may be overheated and its effectiveness diminished. It may also lead to charring which will contaminate the soldering iron tip.

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 0.5 to 1.5 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 X52 flux cored wires have been formulated to leave minimal quantities of flux residue and to resist spitting.

The residue level for X52 is low due to its extra activity which permits a relatively low flux concentration to be used in the wire and because the basic resins are easily volatilised during the soldering process. This may create visible fumes which pose the same potential hazard as any rosin cored solder wire fumes and these should be effectively removed from the operator breathing zone.

Cleaning will not be 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.

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 X52 solid flux is based on modified rosins, carboxylic acid and halide activators. In use it has a mild rosin smell and leaves a small quantity of clear residue.

FLUX PROPERTIES		TEST	RESULT
		Acid value	160mg KOH/g
		Halide content	0.2%
SIR Test (without cleaning)	- IPC-SF-818		Pass
	- Bellcore		Pass
	- J-STD-004		Pass
Electromigration Test (without cleaning)		- Bellcore	Pass
Flux Classification	- IPC-SF-818		MR3CN
	- EN 29454-1		1.1.2
	- J-STD-004		RO M1

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

BELLCORE TR-NWT-000078 ISSUE 3		
SIR TEST RESULTS ON UNCLEANED COMBS		
Test conditions	35°C, 85% RH	
Test time, h	24	96
Surface insulation resistance, ohms	3.7 x 10 <sup>11</sup>	4.9 x 10 <sup>11</sup>
Passmark, ohms	-	10 <sup>11</sup>

IPC-SF-818				
SIR TEST RESULTS ON UNCLEANED COMBS				
Test conditions	85°C, 85% RH			
Test time, h	0	24	96	168
Surface insulation resistance, ohms	6.2 x 10 <sup>11</sup>	1.4 x 10 <sup>9</sup>	4.3 x 10 <sup>9</sup>	8.1 x 10 <sup>9</sup>
Passmark, ohms	-	10 <sup>9</sup>	10 <sup>9</sup>	10 <sup>9</sup>

BELLCORE TR-NWT-000078 ISSUE 3		
ELECTROMIGRATION TEST RESULTS ON UNCLEANED COMBS		
Test conditions	85°C, 85% RH	
Test time, h	96	500
Bias, V (DC)	No bias	10
Surface insulation resistance, ohms	4.4 x 10 <sup>9</sup>	10 <sup>10</sup>
Unfluxed control, ohms	8.9 x 10 <sup>9</sup>	8.8 x 10 <sup>9</sup>

## 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 X52 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.



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