



---

# LEAD-FREE CORED SOLDER WIRES FOR ELECTRONICS

---

## 99C

---

Multicore 99C Cored Solder Wires have been developed to provide lead-free soldering for the electronics and electrical industries.

- **Lead-free**
- **Choice of fluxes for**
  - **No Clean, low residue**
  - **Standard electronics assembly and repair**
  - **Difficult surfaces**
- **Compatible with existing surface finishes and processes**
- **Smooth shiny joints**
- **Cost effective alloy**

### APPLICATIONS

Multicore 99C Cored Solder Wires are designed to be substituted for tin/lead cored solder wires in all hand soldering operations. Minor adjustments to soldering techniques will be required but the resulting soldered joints will perform as well as tin/lead solder joints. Obviously the flux type must be matched to the requirements of the assembly process.

Multicore 99C eliminates the handling hazards due to lead for operators using conventional cored wire products. Where lead has also been eliminated from other coating and soldering processes in PCB and component manufacture, the use of Multicore 99C Cored Solder Wire will ensure that completely lead-free assemblies are produced.

### PRODUCT RANGE

Multicore 99C Cored Solder Wires are lead-free substitutes for eutectic and near eutectic tin/lead solders commonly used for hand soldering. They can be supplied in wire form with a choice of non-corrosive flux cores including Multicore X39, Multicore Ersin 381, Multicore Ersin 362 and Multicore Ersin 399. The general characteristics of these fluxes and the core constructions available are summarised in the table overleaf and further information is presented in separate data sheets. Other combinations and different flux cores may be available on request.

Multicore 99C Cored Solder Wires are available in a wide range of wire diameters down to approximately 0.45mm (0.20in.). Details of packaging and wire diameters are available in a separate data sheet.

### RECOMMENDED OPERATING CONDITIONS

Multicore 99C is a 99.3% tin / 0.7% copper alloy already included in some specifications such as ISO9453 and BS219. It has a melting point of 227°C (440°F) which is approximately 45°C (110°F) higher than the 60% tin / 40% lead alloy commonly used for electronic soldering. It is therefore essential to use a higher soldering iron tip temperature than is normally used with the 60/40 alloy. The minimum acceptable tip temperature is 300°C (572°F). The optimum tip temperature in any particular application will depend on factors such as the thermal mass of the work being soldered but will probably be in the range 350-370°C (660-700°F).

By choosing the appropriate flux core and using the recommended tip temperature, it is possible to produce joints at least comparable in quality with those that would be obtained with lead based solder, using conventional hand soldering equipment.

Guidance on the selection of the appropriate flux core for any particular situation can be obtained from the data sheets on X39 and Ersin Multicore Solder Wires.

It is possible to solder all common finishes used on the solderable surfaces of electronic components and PCBs including tin/lead alloy finishes. If tin/lead coatings are soldered, the resulting joint will be contaminated with lead and the melting temperature (solidus) of the fillet will be reduced to that of eutectic tin/lead alloy. The properties of joints made with 99C are comparable with those made with conventional 60/40 solder.

FLUX TYPE (other flux contents and fluxes may be supplied to special order)	
<b>No Clean</b> Flux content Characteristic	<b>X39B</b> 2 core, 1% Halide free modified rosins, low residue
<b>RMA</b> Flux content Characteristic	<b>Ersin 381</b> 5 core, 3% Mildly activated non-corrosive rosin
<b>Standard product</b> Flux content Characteristic	<b>Ersin 362</b> 5 core, 3% Halide activated non-corrosive rosin
<b>General Purpose</b> Flux content Characteristic	<b>Ersin 399</b> 5 core, 3% Halide activated non-corrosive rosin for difficult to solder surfaces

## TECHNICAL SPECIFICATION

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

ALLOY		
Composition	<b>99%Tin</b> <b>0.45-0.85%Copper</b>	60%Tin 40%Lead
Solidus temperature, °C	<b>227</b>	183
Liquidus temperature, °C	<b>227-240</b>	188
Density, Mg m <sup>-3</sup>	<b>7.31</b>	8.52
Conductivity (% of copper) at ~20°C	<b>13</b>	11.7
<b>Copper lead-through-hole joint properties</b>		
Shear strength, N mm <sup>-2</sup>	<b>28</b>	37
	<b>21</b>	22
Stress to rupture, hours (est.) 5 N mm <sup>-2</sup> , 20°C	<b>4300</b>	500
	<b>1460</b>	<50
Mechanical fatigue, cycles (est.) ± 15 N mm <sup>-2</sup> at 20°C	<b>1100</b>	1500
	<b>900</b>	1350

## HEALTH AND SAFETY

**WARNING:** The following information is for guidance only and users must refer to the Material Safety Data Sheet relevant to specific Multicore 99C solder wire 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 result in sensitisation leading to occupational asthma. Suitable fume extraction equipment should be used to extract flux fumes away from operators.

**Protection and Hygiene:** 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.



**MULTICORE SOLDERS**

**U.K. & World Headquarters:** Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RQ. Tel: 0442 233233 Telex: 82363 KELSEY G Fax: 0442 69554.

**AUSTRALIA:** 2 Hume Road, Smithfield, NSW 2164. Tel: (02) 725-1277 Telex: AA176434MSAP Fax: (02) 725-2896.

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

**GERMANY:** Oskarstrasse 3-7, 5600 Wuppertal 2. Tel: 0202-554047/8 Telex: 8591330 Fax: 0202-550431.

**JAPAN:** Haku 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: 05-576811 Telex: SOLDER MA 44059 Fax: 05-571868.

**SINGAPORE:** No. 2, Fan Young Road, Jurong, Singapore 2262. 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: 214-238-1224 Fax: 214-437-0288 Telex: 792451.

This data is based on information believed to be reliable and is offered in good faith, but MULTICORE MAKES NO WARRANTIES EITHER EXPRESS OR IMPLIED AS TO ITS ACCURACY AND ASSUMES NO LIABILITIES ARISING OUT OF ITS USE BY OTHERS as conditions and methods of use of the products are beyond MULTICORE'S control. The prospective user should determine the suitability of the product before using it on a commercial scale. MULTICORE warrants only that the product will conform to its physical descriptions. MULTICORE MAKES NO OTHER WARRANTIES EXPRESS OR IMPLIED AND EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MULTICORE BE RESPONSIBLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER THE CLAIM IS IN CONTRACT, NEGLIGENCE OR OTHERWISE.