

C - Solder

Product description

C-Solder is the trade name for a group of new tin-based, lead-free low-temperature soldering alloys which enable the joining of various carbon materials, including carbon fibres or carbon nanotube fibres, in both carbon-carbon and carbon-metal combinations. The resultant bond is mechanically strong and electrically conductive.

Characteristics

- ◆ **Melting Point:** 232 °C (solidus temperature)
- ◆ **Density:** ~ 7.4 g/cm³
- ◆ **Excellent flow**
- ◆ **Good wetting of surfaces to be joined**
- ◆ **Electrically and Thermally Conductive**
- ◆ **Aluminium to Aluminium can be soldered without using flux.**
- ◆ **Carbon can be soldered to metals (e.g. Copper, Aluminium), Ceramics and Glass materials**
- ◆ **C-Solder is not affected by cleaning solvents**
- ◆ **C-Solder does not leave residues**
- ◆ **C-Solder is not flammable**
- ◆ **C-Solder is flux Free**
- ◆ **C-Solder is lead Free**

Compliance



Chemical Composition	Tin	Copper	Silver	Chromium
	90 – 100 %	0.01 – 1 %	3 – 5 %	2 – 6 %

Main features of C-Solder compared to Brazing, Adhesive Bonding and Mechanical Fastening

Feature	Brazing	Adhesive Bonding	Mechanical Fastening	Soldering (C-Solder)
Time to make the joint	Minutes to hours	Long cure	Rapid assembly	Up to one minute
Surface Preparation	Minimal	Extensive	Minimal	No surface cleaning
Thin Sections	Yes	Yes	No	Yes
Joint Weight	Light	Light	Heavy	Light
Stress Concentrations	High thermal stresses	Can be very low	Significant	Low
Sensitivity to Peel Forces	Susceptible	Susceptible	Resistant	Susceptible
Sensitivity to Tensile Forces	Resistant	Resistant	Susceptible	Resistant
Applied In-situ	No	Yes	Yes	Yes
Suitability for CNTs, Graphene & Carbon Components	No	Yes	No	Yes
Electrically & Thermally Conductive	Yes	No	No	Yes

Head Office
Goodfellow Cambridge Limited
Ermine Business Park
Huntingdon, PE29 6WR
England

Tel: 0800 731 4653 (UK)
or +44 1480 424 800
Fax: 0800 328 7689 (UK)
or +44 1480 424 900

USA
Goodfellow Corporation
Tel: 1 800 821 2870 (USA)
Fax: 1 800 283 2020 (USA)

info@goodfellowusa.com
www.goodfellowusa.com

FRANCE
Goodfellow SARL

Tél: 0800 917 241 (numéro vert)
ou +44 1480 424 813
Fax: 0800 917 313 (numéro vert)
ou +44 1480 424 900

france@goodfellow.com
www.goodfellow.fr

GERMANY
Goodfellow GmbH

Tel: 0800 1000 579 (freecall)
oder +44 1480 424 810
Fax: 0800 1000 580 (freecall)
oder +44 1480 424 900

info@goodfellow.com
www.goodfellow.com

THE PEOPLE'S REPUBLIC OF CHINA
Goodfellow (Shanghai) Trading Co., Ltd.

Tel: +86 21 6112 1560
Fax: +86 21 6130 4901

china@goodfellow.com
www.goodfellow.cn

JAPAN
Goodfellow Cambridge Limited c/o Intralink Japan Co., Ltd.

Tel: +81 3 5579 9285
Fax: +81 3 5579 9291

Info-jp@goodfellow.com
www.goodfellow-japan.jp

Goodfellow

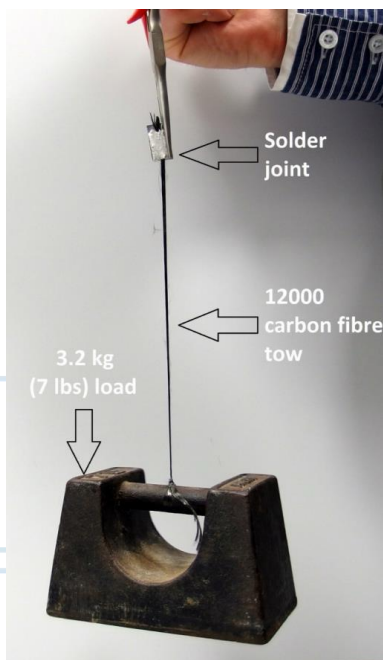
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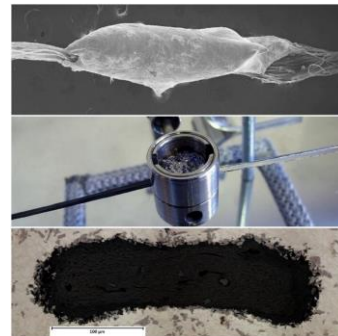
The soldering of carbon materials using C-Solder may be performed in air at temperatures in the range 235 – 450 °C with the use of a classic soldering iron, a soldering heat gun, or a torch.

The high temperatures associated with a brazing process (800 – 1200 °C) may lead to the combustion of carbon materials, in particular nanostructured ones, as well as creating stress concentration during cooling, particularly if the joint comprises materials with considerably different thermal expansion coefficients.

Thanks to its unique patented chemical composition, C-Solder alloys allow more control of the joining processes. Further, C-Solder alloys exhibit improved electrical and mechanical properties in relation to commercially available alloys.



Carbon Nanotube



Handling and Storage:

Indefinite shelf life applies to solid C-Solder at room temperature.

Safety:

Use of adequate ventilation and extraction, and proper personal protective equipment are necessary. Please refer to the Safety Data Sheet for any specific emergency information. Hazardous waste needs to be treated, disposed or recycled, safely according to the Hazardous Waste legislation and regulations.

Properties shown are typical values, they are not absolute material properties, and should be used for guidance only. It is recommended that materials and components are tested for their suitability for a specific application.

For more information and advice please discuss your application with our sales staff.

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