

## PRODUCT DATA SHEET

# Solder Wire

### Introduction

**Solder wire** from Indium Corporation is manufactured to demanding quality standards. All solder wire complies with the requirements of ASTM B-32, J-STD-006 (formerly QQS-571F), and JIS-Z-3282. Our flexible manufacturing process allows us to fulfill orders from evaluation and research quantities to full-scale production volumes.

### Wire Diameters

Capabilities range from .001" (0.025mm) diameter to .250" (6.35mm) and larger. Actual dimensions achievable are subject to the properties of each metal.

We have developed standard tolerances but can work with you to accommodate any special requirements. Standard tolerances are:

| Diameter                          | Standard Tolerance |
|-----------------------------------|--------------------|
| Up to .002" (.050mm)              | ± .0005" (.0127mm) |
| >.002" (.050mm) to .010" (.254mm) | ± .002" (.050mm)*  |
| >.010" (.254mm) to .060" (1.52mm) | ± .002" (.050mm)   |
| >.060" (1.52mm) to .250" (6.35mm) | ± .003" (.076mm)   |
| >.250" (6.35mm)                   | ± 2.5%             |

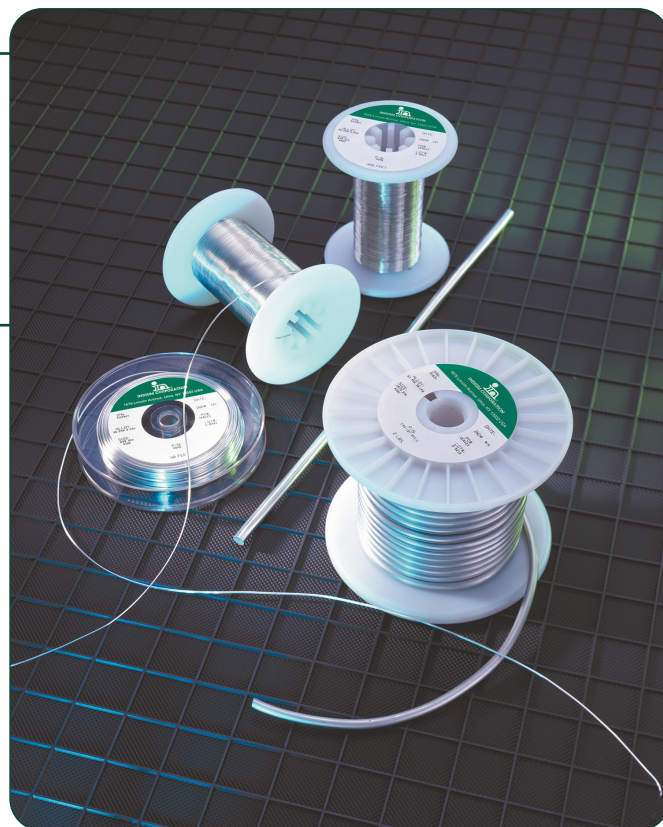
\* Certain alloys can be manufactured with tighter tolerances by request. To learn more about tighter tolerances, please contact your Indium Corporation representative.

### Available Materials

Over 100 alloys can be made into wire, including pure indium and indium alloys, lead-free alloys, gold-tin, tin-lead, and bismuth alloys, as well as many other combinations. Melting temperatures range from 47°C (117°F) to over 364°C (687°F). We can also custom design alloys for your application. On the back of this data sheet is a table of properties for the more common alloys. For more information about our *Solder Alloy Directory*, please contact us.

### Packaging

**Solder wire** is packaged on spools. We can create specialized packaging to meet specific needs, such as spool size, quantity per spool, or other requirements.



### Storage

The shelf life of **solder wire** is determined by the alloy and its resistance to oxidation, as well as the storage container and the conditions in which it is stored.

To increase storage time, and to keep surface oxidation to a minimum, store wire tightly closed in the original container in 55% RH or less, and at temperatures below 22°C. Wire can also be stored in an inert atmosphere, such as a nitrogen dry box.

### Delivery

Short lead times enable you to get your order in time to meet your production schedule.

Each order can be shipped with a Certificate of Analysis, which includes information on metallic impurities. We can also provide a Certificate of Conformance when wire is made to customer specifications.

**From One Engineer To Another®**



Form No. 97622 R12

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### Technical and Customer Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder properties, alloy compatibility and selection of solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

### Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

### Some Physical Properties of Common Solder Wire Alloys

| Liquidus<br>(°C/°F) | Solidus<br>(°C/°F) | Indalloy®<br>Number | Composition        | Plastic<br>Range<br>(°C/°F) | Mass<br>Density<br>(gm/cm³) | Electrical<br>Conductivity<br>(% of Cu) | Thermal<br>Conductivity<br>W/cm°C<br>@ 85°C | Thermal<br>Coefficient of<br>Expansion<br>μ in/in/°C<br>@ 20°C | Tensile<br>Strength<br>(psi) | Bond<br>Holding<br>Strength<br>(Shear)<br>(psi) |
|---------------------|--------------------|---------------------|--------------------|-----------------------------|-----------------------------|-----------------------------------------|---------------------------------------------|----------------------------------------------------------------|------------------------------|-------------------------------------------------|
| 118/244             | 118/244            | 1E                  | 52In/48Sn          | Eutectic                    | 7.30                        | 11.70                                   | 0.34                                        | 20.0                                                           | 1,720                        | 1,630                                           |
| 138/281             | 138/281            | 281                 | 58Bi/42Sn          | Eutectic                    | 8.56                        | 4.50                                    | 0.19                                        | 15.0                                                           | 8,000                        | 500                                             |
| 143/290             | 143/290            | 290                 | 97In/3Ag           | Eutectic                    | 7.38                        | 23.00                                   | 0.73                                        | 22.0                                                           | 800                          | —                                               |
| 154/309             | 149/300            | 2                   | 80In/15Pb/5Ag      | 5/9                         | 7.85                        | 13.00                                   | 0.43                                        | 28.0                                                           | 2,550                        | 2,150                                           |
| 157/315             | 157/315            | 4                   | 100In              | Melting<br>Point            | 7.31                        | 24.00                                   | 0.86                                        | 29.0                                                           | 273                          | 890                                             |
| 167/333             | 154/309            | 9                   | 70Sn/18Pb/12In     | 13/24                       | 7.79                        | 12.20                                   | 0.45                                        | 24.0                                                           | 5,320                        | 4,190                                           |
| 175/347             | 165/329            | 204                 | 70In/30Pb          | 10/18                       | 8.19                        | 8.80                                    | 0.38                                        | 28.0                                                           | 3,450                        | —                                               |
| 179/354             | 179/354            | Sn62                | 62Sn/36Pb/2Ag      | Eutectic                    | 8.41                        | 11.90                                   | 0.50                                        | 27.0                                                           | 7,000                        | 7,540                                           |
| 181/358             | 173/343            | 205                 | 60In/40Pb          | 8/15                        | 8.52                        | 7.00                                    | 0.29                                        | 27.0                                                           | 4,150                        | —                                               |
| 183/361             | 183/361            | Sn63                | 63Sn/37Pb          | Eutectic                    | 8.40                        | 11.50                                   | 0.50                                        | 25.0                                                           | 7,500                        | 6,200                                           |
| 210/410             | 184/363            | 7                   | 50In/50Pb          | 26/47                       | 8.86                        | 6.00                                    | 0.22                                        | 27.0                                                           | 4,670                        | 2,680                                           |
| 220                 | 217                | 241                 | 95.5Sn/3.8Ag/0.7Cu | —                           | 7.38                        | 13.6                                    | —                                           | —                                                              | 6,990                        | 3,916                                           |
| 220/428             | 217/423            | 256                 | 96.5Sn/3.0Ag/0.5Cu | —                           | 7.35                        | 13.2                                    | —                                           | —                                                              | 5,740                        | —                                               |
| 221/430             | 221/430            | 121                 | 96.5Sn/3.5Ag       | Eutectic                    | 7.36                        | 16.00                                   | 0.33                                        | 30.2                                                           | 5,620                        | —                                               |
| 227/441             | 217/423            | 263                 | 99.0Sn/0.3Ag/0.7Cu | —                           | 7.31                        | —                                       | —                                           | —                                                              | —                            | —                                               |
| 232/450             | 232/450            | 128                 | 100Sn              | Melting<br>Point            | 7.28                        | 15.60                                   | 0.73                                        | 24.0                                                           | 1,900                        | —                                               |
| 260/500             | 240/464            | 10                  | 75Pb/25In          | 20/36                       | 9.97                        | 4.60                                    | 0.18                                        | 26.0                                                           | 5,450                        | 3,520                                           |
| 280/536             | 280/536            | 182                 | 80Au/20Sn          | Eutectic                    | 14.51                       | —                                       | 0.57                                        | 16.0                                                           | 40,000                       | 40,000                                          |

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All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.

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