Wire and Cable
Heat-shrink Tubing
Non-shrink Tubing
Braided Sleeving
Screening Braids
Moulded Parts
Terminals and Splices
Wire and Cable Markers
Accessories
Connectors
Backshells

**Bonding Leads**

Metal Braids
Relays and Contactors
Switches and Grips
Adhesives and Tapes
Application Equipment
Added Value Services
Flat, Round, Rope, High-Flex, Lightweight and Quick Release

Manufactured by IS-Cabletec who are part of the IS-Group of companies and can offer a range of specialist high performance metal braid and earth bonding leads, designed and approved for aerospace, defence, industrial and energy market applications.

The comprehensive range of high quality metallic products includes customised and market approved bonding leads, flat, round and rope braids, with various options of materials, terminations, insulation and identification:

Custom Projects

In addition to the standard materials used to produce braids and bonding leads it is also possible to utilise even higher performance materials such as stainless steel, silver plated copper and pure nickel.

These ‘specialist’ materials exhibit properties suitable for the most demanding applications, such as those requiring extreme temperature and corrosion resistance.

Silver-plated Copper:
For applications needing excellent conductivity at temperatures up to 200ºC. Particularly suitable for extreme aerospace and space applications.

Stainless Steel:
Offers outstanding corrosion resistance compared to many materials, particularly when in contact with salt water and high temperature capability up to 400ºC. Ideal for off-shore and marine applications.

Nickel:
Pure nickel strand can be used at even higher temperatures (649ºC) whilst still exhibiting excellent conductivity and corrosion resistance. Nickel is particularly suitable for applications in extreme conditions such as welding, furnaces and power stations.

Market Approvals

Our sister company is a supplier of bonding leads and metal braid to many of the major aerospace and defence companies of Europe and an influential contributor to the development and promotion of the EN4199 European standard for metal braid and bonding leads.

In addition to EN4199, they manufacture products to a comprehensive range of aerospace and defence specifications, some of which are detailed below.

Airbus
ASNE0088 to 0092
Round braid bonding leads, Tin and nickel plated

Typhoon (Eurofighter)
JN1061 Flat braid bonding leads, Ni plated Cu
JN1151 Flat and rope bonding leads, Ni plated Cu
JN1006 Quick release bonding leads, Sn plated Cu
JN1077 Quick release bonding leads, Ni plated Cu
JN1068 Rope bonding leads, Al

Typhoon, Tornado and Hawk
PAN6619 Quick release bonding leads

General
LN9264, CSP48 and AGS2097
Please contact us for more details.
## CONTENTS

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**Flat Bonding Leads**
- FBL Series Flat bonding leads page 394
- CBL150 and CBL260 Series Flat bonding leads page 396
- LN9264 Bonding leads page 398
- AGS2097 Bonding leads page 399

**Round and Rope Bonding Leads**
- CFBA4199-004 Series Round bonding leads page 400
- RBL Series Rope bonding leads page 402
- CRL260 Series High flex bonding leads page 404
- CFBA1068 Series Lightweight bonding leads page 405

**Quick Release**
- QBL150 Series Quick release bonding leads page 406
In addition to our standard products we are able to supply fully customised bonding leads, each with their own unique part number.

Our bonding leads are constructed from an extensive range of manufactured braids and ropes combined with components from a multitude of termination, insulation and identification options, resulting in bonding leads specifically tailored to meet the demands of your application.

We aim to keep the minimum order quantities low, lead times short and ensure that our product quality and customer service levels are consistently high.

Please contact us with your requirements.

**Material Options**
- Plain copper
- Tin-plated copper
- Nickel-plated copper
- Aluminium
- Stainless steel
- Nickel
- Silver plated copper

...other materials available please contact us.

**Terminations**
- Crimped terminal
- Pressed ferrules

**Braid Styles**
- Flat
- Round
- Rope
- Layered

**Insulation and Identification**
- Various materials available, see our heat-shrink tube product range

**Cross-sectional Area**
- 1.5mm$^2$ to 1000mm$^2$

**Features & Benefits**
- Broad range of materials and options
- Insulation and identification options
- Short lead times
- Low MOQs
## Material Selection

<table>
<thead>
<tr>
<th>Material Selection</th>
<th>Conductivity</th>
<th>Corrosion Resistance</th>
<th>Max. Operating Temperature</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>Fair</td>
<td>Fair</td>
<td>371°C</td>
<td>Industrial, Aerospace</td>
</tr>
<tr>
<td>Plain Copper</td>
<td>Good</td>
<td>Fair</td>
<td>150°C</td>
<td>Industrial, Rail</td>
</tr>
<tr>
<td>Tin-plated Copper</td>
<td>Good</td>
<td>Good</td>
<td>150°C</td>
<td>Industrial, Defence</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>Fair</td>
<td>Excellent</td>
<td>400°C</td>
<td>Industrial, Offshore</td>
</tr>
<tr>
<td>Nickel-plated Copper</td>
<td>Excellent</td>
<td>Excellent</td>
<td>260°C</td>
<td>Aerospace, Marine</td>
</tr>
<tr>
<td>Pure Nickel</td>
<td>Excellent</td>
<td>Excellent</td>
<td>649°C</td>
<td>Aerospace, Industrial</td>
</tr>
<tr>
<td>Silver-plated Copper</td>
<td>Excellent</td>
<td>Good</td>
<td>200°C</td>
<td>Aerospace, Space</td>
</tr>
</tbody>
</table>

## Standard Terminal Options (others available)

<table>
<thead>
<tr>
<th>Ring</th>
<th>Forked</th>
<th>Insulated</th>
<th>Pressed</th>
<th>Quick Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial, Defence</td>
<td>Industrial, Defence</td>
<td>Industrial, Defence, Aerospace</td>
<td>Industrial, Defence, Energy</td>
<td>Aerospace, Defence</td>
</tr>
</tbody>
</table>

## Current Rating (Tin-plated Copper)

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Current Rating (amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>28</td>
</tr>
<tr>
<td>2.5</td>
<td>34</td>
</tr>
<tr>
<td>6.0</td>
<td>69</td>
</tr>
<tr>
<td>10.0</td>
<td>97</td>
</tr>
<tr>
<td>16.0</td>
<td>132</td>
</tr>
<tr>
<td>25.0</td>
<td>178</td>
</tr>
<tr>
<td>50.0</td>
<td>282</td>
</tr>
<tr>
<td>100.0</td>
<td>400</td>
</tr>
</tbody>
</table>

For additional information on what is possible or should you have a particular design or application in mind please contact our sales office for details.

Colour tracer identification option available.

Note: Temperature for uninsulated leads, max operating temperature for insulated leads depends on selected material.
FBL bonding leads are manufactured from tin-plated copper flat braid, terminated at each end with a pressed ferrule type connector. The benefit of using pressed ferrules is that you achieve maximum electrical contact with minimum resistance. FBL bonding leads are flexible, robust, durable and reliable; perfect for the most demanding industrial applications. They are available with a wide range of standard lengths and hole sizes, and with or without insulation. In addition, they have low minimum order quantities and short manufacturing lead times.

**Operating Temperature**
- Tin-plated copper: -65°C to +150°C
- Insulated: -40°C to +135°C

**Features & Benefits**
- Pressed ferrule design
- Durable and robust
- Ready to fit design

**Part Numbering example**

**Insulated:**
Leave blank if insulation not required

**Hole sizes:**
See table for options

**Standard Lengths:**
Customer specified

**Cross Sectional Area:**
See table for available sizes

**Part Reference:**
FBL Tin-plated copper

Custom Design:
Other non-standard materials and additional terminal options are available on request, please contact our sales office for information.

---

sales@is-rayfast.com | +44(0)1793 616700
### Cross Sectional Area and Dimensional Information

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Strand Size</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Maximum Allowable Hole Size</th>
<th>Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.15</td>
<td>10</td>
<td>10</td>
<td>2.0</td>
<td>6.5</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>0.15</td>
<td>13</td>
<td>15</td>
<td>2.0</td>
<td>8.5</td>
<td>65</td>
</tr>
<tr>
<td>10</td>
<td>0.15</td>
<td>14</td>
<td>13</td>
<td>3.0</td>
<td>10.5</td>
<td>90</td>
</tr>
<tr>
<td>16</td>
<td>0.20</td>
<td>19</td>
<td>20</td>
<td>3.5</td>
<td>15.0</td>
<td>125</td>
</tr>
<tr>
<td>25</td>
<td>0.15</td>
<td>25</td>
<td>25</td>
<td>4.0</td>
<td>18.0</td>
<td>160</td>
</tr>
<tr>
<td>35</td>
<td>0.20</td>
<td>25</td>
<td>25</td>
<td>4.5</td>
<td>18.0</td>
<td>220</td>
</tr>
<tr>
<td>50</td>
<td>0.20</td>
<td>25</td>
<td>25</td>
<td>5.0</td>
<td>18.0</td>
<td>260</td>
</tr>
</tbody>
</table>

### Hole Size Availability

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Hole Size</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>M4</td>
</tr>
<tr>
<td></td>
<td>4.5mm</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>✓</td>
</tr>
<tr>
<td>16</td>
<td>✓</td>
</tr>
<tr>
<td>25</td>
<td>✓</td>
</tr>
<tr>
<td>35</td>
<td>✓</td>
</tr>
<tr>
<td>50</td>
<td>✓</td>
</tr>
</tbody>
</table>
Bonding Leads

CBL150 and CBL260
Tin & Nickel-plated Copper Braid
Flat Bonding Leads

The CBL range of flat style bonding leads are designed for aerospace and military applications, but are also suitable for higher performance industrial uses.

Available with or without insulation in both tin-plated and nickel-plated copper in a range of cross-sectional areas. They are highly flexible, robust and reliable.

Features & Benefits

• Flexible robust and reliable
• Choice of terminal sizes

Operating Temperature

• Tin-plated copper: -65°C to +150°C
• Nickel-plated copper: -65°C to +260°C
• Insulated -65°C to +150°C

Specifications/Approvals

• Manufactured to EN4199-003 design.

Part Numbering example

CBL260-10-CC-200-S

Insulated:
Leave blank if insulation not required

Lengths:
Min. 50mm and above in 25mm increments

Terminal Reference:
See terminal availability see tables

Cross Sectional Area

1.5  1.5mm²
4   4mm²
6   6mm²
10  10mm²
16  16mm²
25  25mm²

Part Reference:
CBL150  Tin plated copper
CBL260  Nickel plated copper

RoHS compliant
Terminal Availability: **CBL150** tin-plated copper

<table>
<thead>
<tr>
<th>Terminal Code</th>
<th>End Terminals</th>
<th>Availability for Cross-Sectional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stud</td>
<td>Hole Ø</td>
</tr>
<tr>
<td>A</td>
<td>#6</td>
<td>3.68mm</td>
</tr>
<tr>
<td>B</td>
<td>#8</td>
<td>4.34mm</td>
</tr>
<tr>
<td>C</td>
<td>#10</td>
<td>5.00mm</td>
</tr>
<tr>
<td>D</td>
<td>1/4”</td>
<td>6.73mm</td>
</tr>
<tr>
<td>E</td>
<td>5/16”</td>
<td>8.33mm</td>
</tr>
<tr>
<td>F</td>
<td>3/8”</td>
<td>9.91mm</td>
</tr>
</tbody>
</table>

Terminal Availability: **CBL260** nickel-plated copper

<table>
<thead>
<tr>
<th>Terminal Code</th>
<th>End Terminals</th>
<th>Availability for Cross-Sectional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stud</td>
<td>Hole Ø</td>
</tr>
<tr>
<td>A</td>
<td>#6</td>
<td>3.68mm</td>
</tr>
<tr>
<td>B</td>
<td>#8</td>
<td>4.34mm</td>
</tr>
<tr>
<td>C</td>
<td>#10</td>
<td>5.00mm</td>
</tr>
<tr>
<td>D</td>
<td>1/4”</td>
<td>6.73mm</td>
</tr>
<tr>
<td>E</td>
<td>5/16”</td>
<td>8.33mm</td>
</tr>
<tr>
<td>F</td>
<td>3/8”</td>
<td>9.91mm</td>
</tr>
</tbody>
</table>

Technical Information for Uninsulated **CBL260** (Nickel-plated copper) Leads

<table>
<thead>
<tr>
<th>Braid cross-section</th>
<th>Min. Tensile Strength</th>
<th>Nom. resistance 100mm Length</th>
<th>Braid Resistance</th>
<th>Nom. Mass 100mm Length</th>
<th>Braid Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>N</td>
<td>mΩ</td>
<td>mΩ per 25mm</td>
<td>g</td>
<td>g per 25mm</td>
</tr>
<tr>
<td>1.5</td>
<td>250</td>
<td>1.32</td>
<td>0.308</td>
<td>2.6</td>
<td>0.40</td>
</tr>
<tr>
<td>4</td>
<td>600</td>
<td>0.40</td>
<td>0.112</td>
<td>6.3</td>
<td>1.10</td>
</tr>
<tr>
<td>6</td>
<td>800</td>
<td>0.24</td>
<td>0.075</td>
<td>10.7</td>
<td>1.63</td>
</tr>
<tr>
<td>10</td>
<td>1200</td>
<td>0.14</td>
<td>0.046</td>
<td>18.4</td>
<td>2.90</td>
</tr>
<tr>
<td>16</td>
<td>1700</td>
<td>0.09</td>
<td>0.030</td>
<td>28.9</td>
<td>3.93</td>
</tr>
<tr>
<td>25</td>
<td>2200</td>
<td>0.06</td>
<td>0.015</td>
<td>43.2</td>
<td>7.85</td>
</tr>
</tbody>
</table>

For information on nominal resistance and mass for non standard lengths please contact us.
LN9264 is a long established aerospace and defence specification containing a series of uninsulated tin and nickel plated copper bonding leads terminated with a range of crimp style round terminals. They are available in six standard cross-sectional areas and a limited range of lengths.

**Operating Temperature**
- Tin-plated copper: -65°C to +150°C
- Nickel-plated copper: -65°C to +260°C

**Features & Benefits**
- Flat style braid
- Aerospace and military approved

**Part Numbering example**

**Material:**
- T  Tin plated copper
- N  Nickel plated copper

**Standard Lengths:**
- 60mm, 80mm, 100mm, 125mm, 160mm, 200mm and 250mm

**Cross Sectional Area**

<table>
<thead>
<tr>
<th>mm²</th>
<th>amps</th>
<th>Resistance @ 20°C</th>
<th>Terminal Hole Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>16</td>
<td>14.2</td>
<td>4.34</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>5.3</td>
<td>5.00</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
<td>3.5</td>
<td>6.73</td>
</tr>
<tr>
<td>10</td>
<td>65</td>
<td>2.1</td>
<td>6.73</td>
</tr>
<tr>
<td>16</td>
<td>80</td>
<td>1.3</td>
<td>8.33</td>
</tr>
<tr>
<td>25</td>
<td>125</td>
<td>0.85</td>
<td>9.91</td>
</tr>
</tbody>
</table>
AGS2097 bonding leads are a series of aerospace approved bonding leads, generally, but not exclusively, found on legacy aircraft such as Tornado, Hawk and the C-130 (Hercules).

They are only available with one standard braid size 0.7mm\(^2\) and a combination of terminal sizes and lengths.

**Operating Temperature**
- Tin-plated copper: -65\(^\circ\)C to +150\(^\circ\)C

**Features & Benefits**
- Aerospace approved
- 0.7mm\(^2\) cross-sectional area
- Multiple lengths

**Part Numbering example**

**Terminal Code**
End 2

**Standard Lengths:**
1” increments, minimum length 3”.

**Terminal Code**
End 1

**Part Reference:**
CFBA2097

<table>
<thead>
<tr>
<th>Terminal Code</th>
<th>Hole Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>3.68</td>
</tr>
<tr>
<td>C</td>
<td>5.00</td>
</tr>
<tr>
<td>E</td>
<td>6.73</td>
</tr>
<tr>
<td>G</td>
<td>8.33</td>
</tr>
<tr>
<td>J</td>
<td>9.91</td>
</tr>
</tbody>
</table>

RoHS compliant
CFBA4199-004 bonding leads are designed specifically for Aerospace and Military applications. They have undergone extensive mechanical and electrical testing, including flex testing to 250,000 cycles, sinusoidal and random vibration cycles, salt mist testing and temperature cycling.

CFBA4199-004 bonding leads are manufactured from multi-layer round braid and are available in tin-plated and nickel plated copper in a variety of cross-sectional areas, lengths and termination options.

**Operating Temperature**
- Tin-plated copper: -65°C to +150°C
- Nickel-plated copper: -65°C to +260°C

**Specifications/Approvals**
- Tested to EN4199-001

**Part Numbering**

**Terminal Code:**
E  See table opposite

**Standard Lengths:**
250  See table opposite, other lengths available on request.

**Cross Sectional Area**
- 1.4  1.4mm²
- 3.5  3.5mm²
- 4.5  4.5mm²
- 7.0  7.0mm²
- 13.0 13mm²

**Material:**
- T  Tin-plated copper
- N  Nickel-plated copper

**Product standard:**
CFBA4199-004

**Part Reference:**
CFBA4199
**Terminal Code** | **End One** | **End Two** | **Availability for Cross-Sectional Area**
---|---|---|---
| Stud | Hole Ø | Stud | Hole Ø | 1.4mm² | 3.5mm² | 4.5mm² | 7.0mm² | 13.0mm² |
A | #6 | 3.68mm | #6 | 3.68mm | ✓ | ✓ | ✓ |
B | #8 | 4.34mm | #8 | 3.68mm | ✓ | ✓ | ✓ |
C | #10 | 5.00mm | #6 | 3.68mm | ✓ | ✓ | ✓ |
D | 1/4” | 6.73mm | #6 | 3.68mm | ✓ | ✓ | ✓ |
E | #8 | 4.34mm | #8 | 4.34mm | ✓ | ✓ | ✓ |
F | #10 | 5.00mm | #8 | 4.34mm | ✓ | ✓ | ✓ |
G | 1/4” | 6.73mm | #8 | 4.34mm | ✓ | ✓ | ✓ |
H | #10 | 5.00mm | #10 | 5.00mm | ✓ | ✓ | ✓ |
J | 1/4” | 6.73mm | #10 | 5.00mm | ✓ | ✓ | ✓ |
K | 1/4” | 6.73mm | 1/4” | 6.73mm | ✓ | ✓ | ✓ |
L | 5/16” | 8.33mm | #10 | 5.00mm | ✓ | ✓ | ✓ |
M | 5/16” | 8.33mm | 5/16” | 8.33mm | ✓ | ✓ | ✓ |
N | 5/16” | 8.33mm | 1/4” | 6.73mm | ✓ | ✓ | ✓ |

**Standard Lengths**

| ‘L’ mm | 1.4mm² | 3.5mm² | 4.5mm² | 7.0mm² | 13.0mm² |
---|---|---|---|---|---|
63 | ✓ | | | | |
80 | ✓ | ✓ | | | |
100 | ✓ | ✓ | | | |
125 | ✓ | ✓ | | | |
160 | ✓ | ✓ | | | |
200 | ✓ | ✓ | | | |
250 | ✓ | ✓ | | | |
315 | ✓ | | | | |
400 | ✓ | ✓ | | | |
500 | | ✓ | | | |
630 | | | ✓ | | |
800 | | | | ✓ | |
Bonding Leads

RBL Series
Tin-plated Copper
Rope Bonding Leads

RBL bonding leads are stranded rope construction assemblies manufactured from annealed copper ETP1 manufactured to BS EN13602. They are robust, highly flexible and durable, making them perfectly suited to dynamic applications and those in high vibration environments.

In addition, RBL bonding leads boast large cross-sectional areas whilst keeping overall diameters to a minimum making them ideal for size restricted applications.

Operating Temperature
• Tin-plated copper: -65°C to +150°C
• Insulated: -40°C to +135°C

Features & Benefits
• Multi-directional flexibility
• Durable and robust design

Part Numbering example

RBL-4-200-M6-S

Insulated:
Leave blank if insulation not required

Hole sizes:
See table for options

Standard Lengths:
Customer specified

Cross Sectional Area:
See table for available sizes

Part Reference:
RBL Tin plated copper

Custom Design:
Other non-standard materials and additional terminal options are available on request, please contact our sales office for information.
RBL series
Tin-plated Copper
Rope Bonding Leads

Hole Size Availability

<table>
<thead>
<tr>
<th>Cross-sectional Area (mm²)</th>
<th>Hole Size</th>
<th>4.5mm</th>
<th>5.5mm</th>
<th>6.5mm</th>
<th>8.5mm</th>
<th>10.5mm</th>
<th>13.0mm</th>
<th>15.0mm</th>
<th>18.0mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>M4</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>6</td>
<td>M5</td>
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<td>✓</td>
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<tr>
<td>16</td>
<td>M8</td>
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<td>✓</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>M10</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>M12</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>50</td>
<td>M14</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Current Rating Information

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>amps</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>16</td>
<td>120</td>
</tr>
<tr>
<td>25</td>
<td>150</td>
</tr>
<tr>
<td>35</td>
<td>200</td>
</tr>
<tr>
<td>50</td>
<td>240</td>
</tr>
</tbody>
</table>
CRL260 Series
Nickel-plated Copper Braid
High Flex Bonding Leads

CRL260 bonding leads are designed to withstand exceptional levels of flexing in combination with outstanding resistance to corrosion and salt attack. When tested to the flex endurance test in EN4199-001, they withstand over 5 million cycles. Outperforming other existing aerospace standard leads by more than 5 times. Particularly suited for dynamic applications in exposed areas such as external aircraft doors and flaps.

Operating Temperature
• Nickel-plated copper: -65ºC to +260º

Features & Benefits
• Flex endurance to EN4199-001
• Choice of 5 cross sectional areas
• Choice of terminal sizes

Part Numbering example
Terminal Code:
See terminal availability see table below

Standard Lengths:
Min. 50mm and above in 25mm increments

Cross Sectional Area
3.5  3.5mm²
7.0  7mm²
13.0 13mm²

Part Reference:
CRL260  Nickel plated copper

Terminal Availability: CRL260 nickel-plated copper

<table>
<thead>
<tr>
<th>Code</th>
<th>Terminals</th>
<th>Availability for Cross-Sectional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hole Ø</td>
<td>3.5mm²</td>
</tr>
<tr>
<td>A</td>
<td>3.68mm</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>5.00mm</td>
<td>✓</td>
</tr>
<tr>
<td>C</td>
<td>6.73mm</td>
<td>✓</td>
</tr>
<tr>
<td>D</td>
<td>8.33mm</td>
<td>✓</td>
</tr>
<tr>
<td>E</td>
<td>9.91mm</td>
<td>✓</td>
</tr>
</tbody>
</table>
The CFBA1068 aluminium bonding leads are designed for aerospace applications requiring electrical bonding in combination with lightweight. They are supplied insulated and with a protective chromate conversion coating*, making them particularly suited to applications in contact with aviation fuels.

CFBA1068 bonding leads are available in a range of lengths and two sizes of specially formed aluminium terminals.

**Operating Temperature**

- Aluminium: +200°

*Insulated and available with or without Chromate conversion coating.

**Features & Benefits**

- Aluminium*
- Lightweight 5mm² cross-sectional area

**Technical Information (nominal values)**

<table>
<thead>
<tr>
<th>Bonding Lead length (mm)</th>
<th>Resistance (between terminals) (mΩ)</th>
<th>Mass (uninsulated) (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>76.2</td>
<td>2.36</td>
<td>4.0</td>
</tr>
<tr>
<td>101.6</td>
<td>2.78</td>
<td>4.4</td>
</tr>
<tr>
<td>127.5</td>
<td>3.20</td>
<td>4.9</td>
</tr>
<tr>
<td>152.4</td>
<td>3.62</td>
<td>5.3</td>
</tr>
<tr>
<td>177.8</td>
<td>4.04</td>
<td>5.8</td>
</tr>
<tr>
<td>203.2</td>
<td>4.46</td>
<td>6.3</td>
</tr>
<tr>
<td>228.6</td>
<td>4.88</td>
<td>6.7</td>
</tr>
<tr>
<td>254.0</td>
<td>5.30</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Bonding lead length is between terminal hole centres

**Part Numbering example**

**Standard Lengths:**

See table below

**Terminal Code Reference:**

- A  M3 (3.61 to 3.86mm)
- B  M4 (4.90 to 5.16mm)
- C  M5/M6 (6.48 to 7.24mm)

**Part Reference:**

CFBA1068  Aluminium

RoHS compliant
The QBL150 quick release bonding lead provides an effective hand-releasable method of earth bonding electrical equipment. They are particularly useful for applications where a temporary connection is required when equipment needs to be removed quickly over multiple times.

QL bonding leads comprise of a flat tin-plated copper braid with a crimped ring terminal at one end and a BNC or TNC connector at the other. Connection to equipment is via a mating receptacle, mounted on the equipment being earthed.

**Operating Temperature**
- Tin-plated copper: -55ºC to +120º
- Insulated: -55ºC to +120º

**Features & Benefits**
- Fast and easy release.
- Rear and front mounted mating receptacle
- BNC or TNC connector

**Part Numbering example**

**Insulated:**
Leave blank if insulation not required

**Terminal Code Reference:**
- A  M3 (5mm hole)
- B  M4 (6.73mm hole)

**Standard Lengths:**
Min. 50mm and above in 25mm increments

**Connector Code Reference:**
- B  BNC (bayonet)
- T  TNC (threaded)

**Part Reference:**
QL150  Tin plated copper
Also available as Nickel plated copper, without insulation for higher operating temperatures.
Technical Details: **QBL150B (BNC Type)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>BNC, MIL-C-39012 B (class 2, category c)</td>
</tr>
<tr>
<td>Braid</td>
<td>2.64mm², Tin plated copper</td>
</tr>
<tr>
<td>Current rating</td>
<td>36 amps (for 60 seconds)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-55°C to +120°C</td>
</tr>
<tr>
<td>Insulation</td>
<td>PAN6480K04</td>
</tr>
<tr>
<td>Front panel mounting receptacle</td>
<td>QBL150-BF</td>
</tr>
<tr>
<td>Rear panel mounting receptacle</td>
<td>QBL150-BR</td>
</tr>
<tr>
<td>Ring terminal hole diameter</td>
<td>5mm or 6.73mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal</th>
<th>50</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>175</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass (g) 5.0mm hole</td>
<td>-</td>
<td>26.5</td>
<td>27.0</td>
<td>27.5</td>
<td>28.2</td>
<td>28.5</td>
<td>29.5</td>
</tr>
<tr>
<td>Mass (g) 6.0mm hole</td>
<td>-</td>
<td>26.9</td>
<td>27.4</td>
<td>27.9</td>
<td>28.6</td>
<td>28.9</td>
<td>29.9</td>
</tr>
<tr>
<td>Resistance (mΩ)</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Technical Details: **QBL150T (TNC Type)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>TNC, PAN6444A</td>
</tr>
<tr>
<td>Braid</td>
<td>2.64mm², Tin plated copper</td>
</tr>
<tr>
<td>Current rating</td>
<td>36 amps (for 60 seconds)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-55°C to +120°C</td>
</tr>
<tr>
<td>Insulation</td>
<td>PAN6480K04</td>
</tr>
<tr>
<td>Front panel mounting receptacle</td>
<td>QBL150-TF</td>
</tr>
<tr>
<td>Ring terminal hole diameter</td>
<td>5mm or 6.73mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal</th>
<th>50</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>175</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass (g) 5.0mm hole</td>
<td>26.0</td>
<td>26.5</td>
<td>27.0</td>
<td>27.5</td>
<td>28.2</td>
<td>28.8</td>
<td>29.5</td>
</tr>
<tr>
<td>Mass (g) 6.0mm hole</td>
<td>26.4</td>
<td>26.9</td>
<td>27.4</td>
<td>27.9</td>
<td>28.6</td>
<td>29.2</td>
<td>29.9</td>
</tr>
<tr>
<td>Resistance (mΩ)</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Wire and Cable
Heat-shrink Tubing
Non-shrink Tubing
Braided Sleeving
Screening Braids
Moulded Parts
Terminals and Splices
Wire and Cable Markers
Accessories
Connectors
Backshells
Bonding Leads
Metal Braids
Relays and Contactors
Switches and Grips
Adhesives and Tapes
Application Equipment
Added Value Services
Power Shunts and Custom Designed Metal Braids

Manufactured by IS-Cabletec who are part of the IS-Group of companies and can offer a range of specialist high performance metal braid and earth bonding leads, designed and approved for aerospace, defence, industrial and energy market applications.

The comprehensive range of high quality metallic products includes customised and market approved bonding leads, flat, round and rope braids, with various options of materials, terminations, insulation and identification.

Custom Projects

In addition to the standard materials used to produce braids and bonding leads it is also possible to utilise even higher performance materials such as stainless steel, silver plated copper and pure nickel.

These ‘specialist’ materials exhibit properties suitable for the most demanding applications, such as those requiring extreme temperature and corrosion resistance.

Silver-plated Copper:
For applications needing excellent conductivity at temperatures up to 200ºC. Particularly suitable for extreme aerospace and space applications.

Stainless Steel:
Offers outstanding corrosion resistance compared to many materials, particularly when in contact with salt water and high temperature capability up to 400ºC. Ideal for off-shore and marine applications.

Nickel:
Pure nickel strand can be used at even higher temperatures (649ºC) whilst still exhibiting excellent conductivity and corrosion resistance. Nickel is particularly suitable for applications in extreme conditions such as welding, furnaces and power stations.
Power Shunts
Custom Solutions
Large Braid Connectors

Power shunts are large cross-sectional area braided connectors, customised and designed to meet the increasing demands of power distribution applications. They are often produced with multi-layers of flat or round braids to achieve sizes up to 1000mm² and to carry currents in excess of 400 amps.

Used as an alternative to solid bus-bars and power cable assemblies, power shunts are capable of carrying very high currents yet are flexible, robust, easy to install and cost effective.

Ferrule Finishes
Ferrules (end plates) are available with different plated finishes including; Tin, Nickel and Silver.

Features & Benefits
• Large cross-sectional areas
• Broad terminal and braid range
• Space and weight saving
• Cost effective alternative to power cables and solid bus-bars.

Terminations
• High compaction
• Maximum conductivity
• Custom design

Braid Configuration
• Flat or round
• Multi-layered
• High flexibility options

Insulation Jacket Options
• Fluid resistant
• High temperature
• Low smoke and toxicity

RoHS compliant
Braid and Termination Selection

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Nom. Current Rating</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>amps</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>100</td>
<td>380</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>120</td>
<td>410</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>150</td>
<td>450</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>200</td>
<td>600</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Please use the tables below to establish the cross-sectional area and nominal current rating required for your application, in conjunction with ferrule type required to match requirements. Please contact us for further information.

The current rating values in the tables above are based on simple flat braid configurations, for a temperature rise of 50°C above ambient. The actual current rating of a power shunt will vary accordingly to the design and layout of the final braid configuration. It is recommended that each power shunt be tested and evaluated fully to ascertain its suitability to meet the requirements of its final application.
Metal Braids

Custom and Specialised Flat Braids

An extensive range of flat braids from a wide choice of materials, including stainless steel, aluminium, plain copper, tin-plated copper and nickel-plated copper.

The electrical performance of a braid is determined by selecting the correct cross sectional area from the table.

By changing the conductor strand size it is possible to improve the braid flexibility and vibration resistance whilst maintaining its current rating; the smaller the strand size, the more flexible the braid.

Operating Temperature

- Tin-plated copper: -65°C to +150°C
- Nickel-plated copper: -65°C to +260°C
- Insulated: See table
- Other materials - contact us for details

Features & Benefits

- Wide choice of materials
- Highly flexible
- Non-standard versions available
- Wire sizes from 0.05mm to 0.4mm

Part Numbering example

FB-10.0-5-15/1

Design Detail:
Custom configuration (Internal use only)

Conductor Material:
1. Bare copper
2. Tin-plated copper
3. Nickel-plated copper
4. Phosphor bronze
5. Stainless steel
6. Oxygen free copper
7. Silver plated copper
8. Nickel 200
9. Aluminium
10. Galvanised mild steel
11. Monel
12. Bright annealed mild steel

Plus many more, please speak to our sales office with your requirements

Cross Sectional Area:
See table for standard available sizes

Part Reference:
FB  Flat braid
FBJ  Flat braid with jacket
Specialist braids are available using numerous conductor materials as identified, such as using nickel and nickel plated copper for increased temperature and corrosion resistance and aluminium for applications requiring weight savings. Flat braids are also available with the option of PVC or zero-halogen extruded jackets, providing mechanical protection and electrical insulation. There are numerous options and permutations possible with the facilities available, so please contact us for additional information or to discuss your particular requirements.

### Standard Flat Braids - Product Details (Un-insulated Tin-plated copper)

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Width and Depth</th>
<th>Current Rating</th>
<th>amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td>mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.5 x 0.5</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>2.0 x 0.5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>6.0 x 0.8</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>8.0 x 1.0</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>10.0 x 1.0</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>13.0 x 1.3</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>16.0</td>
<td>19.0 x 1.5</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>25.0</td>
<td>25.0 x 2.0</td>
<td>178</td>
<td></td>
</tr>
<tr>
<td>35.0</td>
<td>25.0 x 3.5</td>
<td>223</td>
<td></td>
</tr>
<tr>
<td>50.0</td>
<td>20.0 x 4.0</td>
<td>282</td>
<td></td>
</tr>
<tr>
<td>70.0</td>
<td>32.0 x 5.0</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

Current ratings are based on temperature rise of 50°C above ambient

### Insulation Options

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour Availability</th>
<th>Temperature Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>Clear, Black, Red, Green, Yellow, Green, Green/Yellow, Blue, White</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>LSZH Low Smoke Zero Halogen</td>
<td>Clear, Black, Red, Green, Yellow, Green, Green/Yellow, Blue, White</td>
<td>-20°C to +80°C</td>
</tr>
</tbody>
</table>
Metal Braids

RB and RS
Custom and Specialised
Round Braids and Ropes

An extensive range of hollow round braids and ropes from a wide choice of materials.

The electrical performance of a braid is determined by selecting the correct cross sectional area from the tables.

Round braids and ropes exhibit multi-axial flexibility, enabling them to be installed in any direction. Rope braids, in particular are strongly recommended for applications needing outstanding flexibility and robustness with maximum flex performance.

Operating Temperature
- Tin-plated copper: -65°C to +150°C
- Nickel-plated copper: -65°C to +260°C
- Insulated: See table
- Other materials - contact us for details

Features & Benefits
- Wide choice of materials
- Highly flexible
- Non-standard versions available
- Wire sizes from 0.05mm to 0.4mm

Part Numbering example

RB-10.0-5-15/1

Design Detail:
Custom configuration (Internal use only)

Conductor Material:
1. Bare copper
2. Tin-plated copper
3. Nickel-plated copper
4. Phosphor bronze
5. Stainless steel
6. Oxygen free copper
7. Silver plated copper
8. Nickel 200
9. Aluminium
10. Galvanised mild steel
11. Monel
12. Bright annealed mild steel

Plus many more, please speak to our sales office with your requirements

Cross Sectional Area:
See table for standard available sizes

Part Reference:
RB Round braid
RBJ Round braid with jacket
RS Rope strand
RSJ Rope strand with jacket
Specialist braids are available using numerous conductor materials as identified, such as using nickel and nickel plated copper for increased temperature and corrosion resistance and aluminium for applications requiring weight savings. Round braids are also available with the option of PVC or zero-halogen extruded jackets, providing mechanical protection and electrical insulation. There are numerous options and permutations possible with the facilities available, so please contact us for additional information or to discuss your particular requirements.

**Standard Hollow Round Braids - Product Details** (Un-insulated Tin-plated copper)

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Nom. Diameter</th>
<th>Current Rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm²</td>
<td>1.2 mm</td>
<td>12 amps</td>
</tr>
<tr>
<td>1.1 mm²</td>
<td>2.0 mm</td>
<td>20 amps</td>
</tr>
<tr>
<td>2.5 mm²</td>
<td>3.0 mm</td>
<td>30 amps</td>
</tr>
<tr>
<td>4.0 mm²</td>
<td>4.0 mm</td>
<td>50 amps</td>
</tr>
<tr>
<td>6.0 mm²</td>
<td>5.0 mm</td>
<td>60 amps</td>
</tr>
<tr>
<td>10.0 mm²</td>
<td>7.0 mm</td>
<td>80 amps</td>
</tr>
<tr>
<td>16.0 mm²</td>
<td>8.0 mm</td>
<td>110 amps</td>
</tr>
<tr>
<td>25.0 mm²</td>
<td>10.0 mm</td>
<td>130 amps</td>
</tr>
<tr>
<td>35.0 mm²</td>
<td>12.0 mm</td>
<td>180 amps</td>
</tr>
<tr>
<td>50.0 mm²</td>
<td>15.0 mm</td>
<td>230 amps</td>
</tr>
</tbody>
</table>

**Standard Rope Strands - Product Details** (Un-insulated Tin-plated copper)

<table>
<thead>
<tr>
<th>Cross-sectional Area</th>
<th>Nom. Diameter</th>
<th>Current Rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 mm²</td>
<td>2.5 mm</td>
<td>30 amps</td>
</tr>
<tr>
<td>4.0 mm²</td>
<td>3.0 mm</td>
<td>50 amps</td>
</tr>
<tr>
<td>6.0 mm²</td>
<td>4.0 mm</td>
<td>60 amps</td>
</tr>
<tr>
<td>10.0 mm²</td>
<td>4.5 mm</td>
<td>80 amps</td>
</tr>
<tr>
<td>16.0 mm²</td>
<td>5.7 mm</td>
<td>110 amps</td>
</tr>
<tr>
<td>25.0 mm²</td>
<td>7.5 mm</td>
<td>130 amps</td>
</tr>
<tr>
<td>35.0 mm²</td>
<td>9.0 mm</td>
<td>180 amps</td>
</tr>
<tr>
<td>50.0 mm²</td>
<td>11.0 mm</td>
<td>230 amps</td>
</tr>
<tr>
<td>70.0 mm²</td>
<td>13.0 mm</td>
<td>280 amps</td>
</tr>
<tr>
<td>95.0 mm²</td>
<td>15.0 mm</td>
<td>330 amps</td>
</tr>
</tbody>
</table>

*Current ratings are based on temperature rise of 50°C above ambient

**Insulation Options** - Identified at end of part number e.g. RBJ-010-2-15/1 (BLACK PVC)

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour Availability</th>
<th>Temperature Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>Clear, Black, Red, Green, Yellow, Green, Green/Yellow, Blue, White</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>LSZH Low Smoke Zero Halogen</td>
<td>Clear, Black, Red, Green, Yellow, Green, Green/Yellow, Blue, White</td>
<td>-20°C to +80°C</td>
</tr>
</tbody>
</table>
High expansion ratio braids are available for applications such as those over cable joints for earthing continuity and mechanical protection. With the number and gauge of wire strands used in the braid to determine the characteristics required, including current rating and cross sectional area.

The selection table shows some common sizes that are achievable, other custom sizes are available subject to specification and quantity required, please contact us for details and MOQ’s.

Where mechanical protection is the primary consideration alternative materials are available, such as: Galvanised steel; Stainless steel and Mild steels. Please contact us for further details.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Nom. CSA</th>
<th>Current Rating</th>
<th>Wire Ø</th>
<th>Usable Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm²</td>
<td>Amps</td>
<td>mm</td>
<td>Min. mm</td>
</tr>
<tr>
<td>HiXP-6-40-2</td>
<td>6.0</td>
<td>66</td>
<td>0.20</td>
<td>6.0</td>
</tr>
<tr>
<td>HiXP-10-40-2</td>
<td>10.0</td>
<td>90</td>
<td>0.20</td>
<td>10.0</td>
</tr>
<tr>
<td>HiXP-16-60-2</td>
<td>16.0</td>
<td>120</td>
<td>0.30</td>
<td>10.0</td>
</tr>
<tr>
<td>HiXP-25-60-2</td>
<td>25.0</td>
<td>150</td>
<td>0.30</td>
<td>15.0</td>
</tr>
<tr>
<td>HiXP-35-120-2</td>
<td>35.0</td>
<td>200</td>
<td>0.30</td>
<td>20.0</td>
</tr>
<tr>
<td>HiXP-50-120-2</td>
<td>50.0</td>
<td>250</td>
<td>0.30</td>
<td>30.0</td>
</tr>
<tr>
<td>HiXP-95-150-2</td>
<td>95.0</td>
<td>350</td>
<td>0.20</td>
<td>25.0</td>
</tr>
<tr>
<td>HiXP-150-150-2</td>
<td>150.0</td>
<td>500</td>
<td>0.20</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Typical applications include earth continuity on cable joints, as shown below.
Over-Braiding Service
Our over-braiding service is designed to offer a comprehensive range of materials and constructions providing an effective braid protection suited to your application, up to 60mm diameter.

The comprehensive over-braiding service facilitates customer free issue material. Or alternatively supplied by us from our own extensive product range of conduit, tubing and substrates.

Whether your need is for mechanical protection, earthing continuity or EMI screening, our engineers are on hand to offer you a product that will perfectly meet your application...

- Cables
- Conduits
- Hoses
- Mechanical Protection
- Armouring
- Screening

Features & Benefits
- Wide choice of materials
- Highly flexible
- Non-standard versions available

Custom Braid Solutions
IS-Cabletec is a specialist manufacturer of high performance metal braided products, customised cables and bespoke assemblies for Aerospace, Defence and Industrial applications.

The extensive on-site facilities at IS-Cabletec enables numerous multicore cable and braiding constructions to be manufactured, which has led to the company becoming the UK’s leading manufacturer of EMI screening braids, earth bonding leads, earth leads, copper braids, flexible bus-bars and power shunts.

The aim is to provide our customers with a complete solution to all high performance electrical component needs.