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
Comprehensive Range of High Performance Wire and Cable for Harsh Environments

An extensive portfolio of wire and cable products are available in a wide range of conductor sizes, constructions and colours. The product range covers primary wire, screened and jacketed multi-core, airframe, coaxial, miniature and custom cables.

Typical characteristics include chemical and fluid resistance, lightweight, highly flexible and excellent electrical and mechanical performance. Temperature capabilities range from -65°C to +260°C allowing products to be used in a wide variety of markets and applications.

The current stock profile also contains a large selection of Aerospace wire and cables, including XLETFE, XLPE/XLPVDF and Hybrid constructions for use in the majority of today’s commercial and military aircraft fleets.

Typical Features & Benefits

- Chemical resistance
- Electrical insulation
- Fluid & solvent resistance
- Flexibility
- Flame-retardant, Low Smoke
- Lightweight
- Extreme temperature performance
- Materials available to suit a wide range of markets and applications

We are committed to supplying an extensive range of wire and cable products using the latest insulation technologies, with a wide choice of constructions, conductor sizes and colours.

High Performance Wire and Cable

Selection of wire and cable for Aerospace, Defence, Marine and other challenging environment applications, where durable, light weight and strength is required.

Thin wall technology offering up to 33% space savings and up to 50% reduction in weight for your given wire bundle, compared to conventional wire.

Complete range of wires and cables for both commercial and military aerospace applications, Airbus Group and Boeing approved.

Power

Flexible high performance power cables.

Controlled Electrical Cables

Probably the lightest, toughest and most flexible range of wire and cable available for harsh environment applications.

Multicore Cable

Specialist application multicore cables for tough environments and custom build solutions for those special projects.
# High Performance Wire and Cable

<table>
<thead>
<tr>
<th>Spec</th>
<th>Description</th>
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</tr>
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<tbody>
<tr>
<td>Spec 44</td>
<td>Dual wall, 150°C rated, XL-PVDF</td>
<td>14</td>
</tr>
<tr>
<td>Spec 55</td>
<td>Single or dual wall, 200°C rated, XL-ETFE</td>
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<tr>
<td>Spec 55D</td>
<td>Defence Standard 61-12 Part 33/001</td>
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<tr>
<td>Spec 99M</td>
<td>Dual wall, 120°C rated, LFH, XLPE</td>
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<td>Spec 100</td>
<td>Zero halogen, including Rail EN50306</td>
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<td>PTFE</td>
<td>Single wall, 260°C rated fluorocarbon polymer</td>
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<tr>
<td>M22759</td>
<td>Mil and Aerospace specification</td>
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</tr>
<tr>
<td>M81044</td>
<td>Mil and Aerospace specification</td>
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<td>M27500</td>
<td>Mil and Aerospace specification</td>
<td>49</td>
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<tr>
<td>EN Specs</td>
<td>European / Airbus Group specification</td>
<td>52</td>
</tr>
<tr>
<td>BMS13-XX</td>
<td>Boeing specification</td>
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# Power Cable

<table>
<thead>
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<tbody>
<tr>
<td>ZHPCG</td>
<td>Zero Halogen Power Cable</td>
<td>62</td>
</tr>
<tr>
<td>TR, ZHI, AFR, FTR</td>
<td>Performance flexible power</td>
<td>64</td>
</tr>
<tr>
<td>SHF260</td>
<td>Ultra flexible power cable</td>
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# RF and DATA Cables

<table>
<thead>
<tr>
<th>RF and DATA Cables</th>
<th>Description</th>
<th>Page</th>
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<tbody>
<tr>
<td>Coaxial cable</td>
<td>Cheminax®</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>RFMates® and VideoMates®</td>
<td>70</td>
</tr>
<tr>
<td>High speed cable</td>
<td>Ethernet, USB and Quadrax</td>
<td>72</td>
</tr>
<tr>
<td>Microwave cable</td>
<td>High frequency X and Ku band</td>
<td>73</td>
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</table>

# Multicore Cable

<table>
<thead>
<tr>
<th>Multicore Cable</th>
<th>Description</th>
<th>Page</th>
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<tbody>
<tr>
<td>Def Stan 61-12 part 25</td>
<td>Zerohal Marine UK Defence standard</td>
<td>74</td>
</tr>
<tr>
<td>Specialist</td>
<td>Nuclear, Robotics and Sub-Sea</td>
<td>76</td>
</tr>
<tr>
<td>Custom</td>
<td>Multi-conductor cables, custom designed</td>
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</table>
SPEC 44 wire has a dual wall construction which combines the outstanding physical and electrical characteristics of radiation crosslinked polyalkene with the excellent mechanical and chemical properties of radiation cross-linked polyvinylidene fluoride (PVDF). The result is a wire insulation system that offers a 150°C temperature rating, small size, light weight, solder iron resistance, and resistance to most solvents, fuels and lubricants.

Originally developed for aerospace and military requirements in applications of high density and complex circuitry, SPEC 44 wire and cable now finds wide use throughout industry, in commercial and military electronics, avionics, on satellites, aircraft, helicopters, ships, trains, military ground systems and offshore platforms where environmental conditions demand consistently reliable performance.

In airframe applications SPEC 44 constructions can offer a modern dimensional replacement for PVC/Nylon/Glass braid type wire and cables.

**Features & Benefits**
- Dual wall construction
- 600,1000 & 2500 voltage ratings
- Small, lightweight and flexible
- Low smoke and low corrosive gas generation
- Resistance to most chemicals and electrical arc tracking

**Operating Temperature**
- -65°C to +150°C

**Specifications/Approvals**
- SAE AS81044 (wires)
- NEMA-WC-27500 (cables)
- Def Stan 61-12, Part 18 (maintenance)
- Def Stan 61-12, Part 26
- VG 95218 parts 20, 21, 22, 23 and 1000
- NATO stock numbers available for most standard constructions

44 Wire is available in an extensive variety of constructions, voltage ratings, sizes and colours. For further assistance regarding your specific wire and cable requirements, please contact us.
<table>
<thead>
<tr>
<th><strong>Product Characteristics</strong></th>
<th><strong>Product Performance</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Physical</strong></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-65°C to +150°C</td>
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<tr>
<td>Tensile strength (primary insulation)</td>
<td>28N/mm² (4000psi)</td>
</tr>
<tr>
<td>Ultimate elongation</td>
<td>230% (min)</td>
</tr>
<tr>
<td>Electrical arc tracking</td>
<td>Tested to ASTM-D-3032</td>
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<tr>
<td>Solder iron resistance at +370°C, 1 min.</td>
<td>Pass</td>
</tr>
<tr>
<td>Notch propagation, 0.05mm notch</td>
<td>Pass</td>
</tr>
<tr>
<td>Shrinkage @ +300°C</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Low temperature bend</td>
<td>-65°C</td>
</tr>
<tr>
<td>Fuels, oils &amp; solvents resistance</td>
<td>Pass</td>
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<tr>
<td><strong>Electrical</strong></td>
<td></td>
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<tr>
<td>Voltage rating</td>
<td>600V, 1000V &amp; 2500V</td>
</tr>
<tr>
<td>Insulation resistance (min)</td>
<td>1500MΩ/km (5000MΩ/1000ft)</td>
</tr>
<tr>
<td>Voltage withstand</td>
<td>2500V, 3000V &amp; 5000V 5 min. 50 - 60Hz</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td></td>
</tr>
<tr>
<td>Federal aviation reg. FAR-25</td>
<td>Pass</td>
</tr>
<tr>
<td>SAE AS81044</td>
<td>Pass</td>
</tr>
<tr>
<td>BS EN 50265 Vertical Flammability</td>
<td>Pass</td>
</tr>
<tr>
<td>S-424 14751 (Swedish chimney)</td>
<td>Pass</td>
</tr>
<tr>
<td>NFC-32070 (2) (French chimney)</td>
<td>Pass</td>
</tr>
<tr>
<td>IEC-60332 Part 3 (cable ladder)</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Smoke/Toxicity</strong></td>
<td></td>
</tr>
<tr>
<td>Smoke index, Def Stan 61-12 Part 18</td>
<td>6.0 units per metre of wire</td>
</tr>
<tr>
<td>Toxicity index, Def Stan 61-12 Part 18</td>
<td>0.8 units per metre of wire</td>
</tr>
<tr>
<td>BS EN 150-4589 pt2/pt3 oxygen index</td>
<td>&gt;30% Oxygen</td>
</tr>
<tr>
<td>Temperature index, NES 715</td>
<td>&gt;300°C</td>
</tr>
</tbody>
</table>
44 Wire
Ordering
High performance wire and cable

ORDERING INFORMATION

Colours:
0 = Black  5 = Green
1 = Brown  6 = Blue
2 = Red    7 = Violet
2L = Pink  8 = Grey
3 = Orange 9 = White
4 = Yellow 45 = Yellow/Green

Stripes are also available on request and are indicated by additional insulation colour numbers

e.g. 92 = White with Red stripe

Standard packaging:
300m reels for “standard” items. If the product is a non-stock item a Minimum Order Quantity (MOQ) may apply.

Ordering Description:
Follow steps 1 to 6.
1. Select the type of wire
2. Select the number of conductors
3. Select the type of conductor
4. Select the wire conductor size
5. Select the primary wire insulation colour(s)
6. Select the outer jacket colour

Ordering Examples:
- Where a single 22awg 600V white primary wire is required the part number is 44A0111-22-9
- Single 16awg 600V white primary wire, with shield and an outer white jacket is required the part number is 44A1111-12-9-9
- Where two core 600V cable with an overall shield and an outer jacket and a conductor size of 18awg, with core insulation colours red and blue. The outer jacket is white with a red stripe the part number is 44A1121-18-2/6-92
- Three core 600V cable with an overall shield and an outer jacket with conductor size for each of the primary cores is 24awg, with core insulation colours red, yellow and blue and outer jacket is white. The part number is 44A1131-24-2/4/6-9

ADDITIONAL INFORMATION

The page opposite illustrates how to build your own part number and is intended as a cross reference only. For further information or assistance please contact us.

Standard Wire Insulation Colours

0 - Black
1 - Brown
2 - Red
2L - Pink
3 - Orange
4 - Yellow
5 - Green
6 - Blue
7 - Violet
8 - Grey
9 - White
45 - Yellow/Green
Part Numbering example

JACKET COLOUR
(codes same as for Primary wire colour below)

PRIMARY WIRE INSULATION COLOUR
0    Black      5    Green
1    Brown      6    Blue
2    Red        7    Violet
3    Orange      8    Grey
4    Yellow      9    White

CONDUCTOR SIZE (AWG)
30 to 0000

CONDUCTOR TYPE
1    Tin plated copper
2    Silver plated copper
3    Nickel plated copper
4    Silver plated high strength copper alloy
5    Aluminium
6    Nickel coated high strength copper alloy

NUMBER of CONDUCTORS
1 through 10 (designator for 10 conductor = 0)

VOLTAGE
1    600 volt, general purpose
2    1000 volt, general purpose
3    2500 volt, general purpose
7    600 volt, airframe (normal weight)
8    600 volt, airframe (medium weight)

CONSTRUCTION
0    Primary wire; or unshielded & unjacketed
1    Round braid shielded & jacketed
2    Tin-plated flat braid shielded & jacketed
3    Round braid shielded NO jacket
4    Jacketed NO shield (2 core or more only)
5    Spiral braid shielded & jacketed
7-9  Special constructions

TYPE
A    150°C (XL-PVF2 cable jacket)
B    150°C (XL-ETFE cable jacket)
D    135°C (XL-PVF2) - Def Stan 61-12 pt 26
     /    135°C (XL-PVF2 cable jacket) - USA only

BASIC PRODUCT NUMBER
Spec 44 high performance wire
### 600V Primary Wire Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal CSA (mm²)</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.102</td>
<td>0.06</td>
<td>0.69</td>
<td>1.06</td>
<td>44A0111-30-X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.127</td>
<td>0.09</td>
<td>0.76</td>
<td>1.48</td>
<td>44A0111-28-X</td>
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<tr>
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<td>19/0.102</td>
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<td>0.86</td>
<td>2.08</td>
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</tr>
<tr>
<td>24</td>
<td>19/0.127</td>
<td>0.25</td>
<td>1.02</td>
<td>2.98</td>
<td>44A0111-24-X</td>
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<tr>
<td>22</td>
<td>19/0.160</td>
<td>0.40</td>
<td>1.19</td>
<td>4.46</td>
<td>44A0111-22-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.203</td>
<td>0.60</td>
<td>1.40</td>
<td>6.70</td>
<td>44A0111-20-X</td>
</tr>
<tr>
<td>18</td>
<td>19/0.254</td>
<td>1.00</td>
<td>1.65</td>
<td>10.12</td>
<td>44A0111-18-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.287</td>
<td>1.25</td>
<td>1.83</td>
<td>12.80</td>
<td>44A0111-16-X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.361</td>
<td>2.00</td>
<td>2.26</td>
<td>19.64</td>
<td>44A0111-14-X</td>
</tr>
<tr>
<td>12</td>
<td>37/0.320</td>
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<td>2.74</td>
<td>30.06</td>
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### 1000V Primary Wire Dimensions

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<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
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</thead>
<tbody>
<tr>
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<td>3.57</td>
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<tr>
<td>22</td>
<td>19/0.160</td>
<td>1.37</td>
<td>5.21</td>
<td>44A0211-22-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.203</td>
<td>1.57</td>
<td>7.54</td>
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### 600V Single Core Screened & Jacketed Cable Dimensions

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<td>5.83</td>
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</tr>
<tr>
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<td>19/0.127</td>
<td>1.83</td>
<td>8.20</td>
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</tr>
<tr>
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<td>19/0.160</td>
<td>2.00</td>
<td>10.30</td>
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<td>19/0.287</td>
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<td>23.40</td>
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<tr>
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<td>32.50</td>
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<td>45.67</td>
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### 600V Twisted Pair Primary Wire Dimensions

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<th>Ordering Description</th>
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<tbody>
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<td>2.38</td>
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<td>3.13</td>
<td>44A0121-28-X/X</td>
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<tr>
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<td>19/0.102</td>
<td>1.73</td>
<td>4.38</td>
<td>44A0121-26-X/X</td>
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<tr>
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<td>19/0.127</td>
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<tr>
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<td>19/0.160</td>
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<td>9.37</td>
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<tr>
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<td>21.25</td>
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<tr>
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<td>3.65</td>
<td>26.88</td>
<td>44A0121-16-X/X</td>
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<td>19/0.361</td>
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### 600V 2-Core Screened & Jacketed Cable Dimensions

<table>
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<th>Conductor Size</th>
<th>Stranding No/mm</th>
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<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
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<tbody>
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<td>2.38</td>
<td>10.10</td>
<td>44A1121-28-X/X/X-X</td>
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<td>19/0.102</td>
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<td>11.49</td>
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<td>16.12</td>
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<tr>
<td>22</td>
<td>19/0.160</td>
<td>3.35</td>
<td>20.59</td>
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<td>20</td>
<td>19/0.203</td>
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<td>26.71</td>
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<td>42.98</td>
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</tr>
<tr>
<td>14</td>
<td>19/0.361</td>
<td>5.53</td>
<td>61.34</td>
<td>44A1121-14-X/X/X-X</td>
</tr>
</tbody>
</table>

### 600V 3-Core Screened & Jacketed Cable Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>7/0.127</td>
<td>2.49</td>
<td>13.26</td>
<td>44A1131-28-X/X/X-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.102</td>
<td>2.82</td>
<td>18.85</td>
<td>44A1131-26-X/X/X-X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.127</td>
<td>3.15</td>
<td>24.66</td>
<td>44A1131-24-X/X/X-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.160</td>
<td>3.56</td>
<td>32.14</td>
<td>44A1131-22-X/X/X-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.203</td>
<td>3.99</td>
<td>40.78</td>
<td>44A1131-20-X/X/X-X</td>
</tr>
<tr>
<td>18</td>
<td>19/0.254</td>
<td>4.57</td>
<td>53.02</td>
<td>44A1131-18-X/X/X-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.287</td>
<td>4.98</td>
<td>67.31</td>
<td>44A1131-16-X/X/X-X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.361</td>
<td>5.89</td>
<td>85.88</td>
<td>44A1131-14-X/X/X-X</td>
</tr>
</tbody>
</table>
55 Wire
Single or Dual Wall 200°C rated, XL-ETFE
High performance wire and cable

55 wire is insulated with modified radiation cross-linked ETFE polymer and combines the easy handling of a flexible thin wall wire, with excellent scrape abrasion and cut-through characteristics.

The single wall construction is currently used extensively throughout industry, applications include commercial wiring, avionics, satellites, aircraft, helicopters and high performance military and motorsport electronics or wherever there is a demand for reliable performance under extreme conditions.

The dual wall airframe construction also available, is commonly used on numerous commercial and military aircraft programmes throughout the world.

Features & Benefits
- Resistant to electrical arc tracking in wet or dry conditions
- Single or dual wall construction
- Small size, ultra light weight
- Exceptional chemical resistance

Operating Temperature
- -65°C to +150°C (Tin plated conductors - standard)
- -65°C to +200°C (Silver/Nickel plated conductors)

Specifications/Approvals
- SAE AS22759/32-35 & 41-46 (wires)
- NEMA-WC-27500 (cables)
- Def Stan 61-12, Part 33
- VG95218 Part 20, Type 21, Type A; Part 22, Type A; Part 23, Type A; Part 1001 & 1002
- VDE 9426, 9427, 9428
- British Standards 3G233
- Boeing BMS 13-48
- Airbus ABS 0820 to 0826
- NASA preferred product list
- European Space Agency 3901/012, 3901/020 and 3901/022

Spec 55 Wire Construction
A wide range of 55 spec wire constructions are available, the most commonly used are:

Equipment Wire - Single Wall

Airframe Wire - Dual Wall

Twisted Single Cores

Screened & Jacketed Twisted Pair

Note
55 Wire is available in an extensive variety of constructions, sizes and colours. For further assistance regarding your specific wire and cable requirements, please contact us.
## 55 Wire
**Single or Dual Wall 200°C rated, XL-ETFE**
**High performance wire and cable**

<table>
<thead>
<tr>
<th>Physical</th>
<th>Product Characteristics</th>
<th>Operating temp (Tin plated conductor)</th>
<th>-65°C to +150°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Operating temp (silver or nickel plated conductor)</td>
<td>-65°C to +200°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal endurance</td>
<td>200°C for 10,000 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scrape abrasion (BS3G 233)</td>
<td>&gt;100 cycles at +150°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flexible endurance (Boeing BSS 7324)</td>
<td>&gt;1000 cycles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tensile strength + core elongation</td>
<td>(Airframe wire only) 35 N/mm², 125%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tensile strength + total elongation</td>
<td>(All primary wire) 35 N/mm², 75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notch propagation BS3G 230 0.05mm notch</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solder iron resistance (370°C, 1 minute)</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solder ability, tin plated copper conductor BS3G 233 conditions</td>
<td>&lt;0.8 secs to wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shrinkage @ +200°C</td>
<td>&lt;1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water absorption</td>
<td>&lt;0.03%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Permittivity 1 KHz (ASTM D150)</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dissipation factor (ASTM D150)</td>
<td>0.001</td>
</tr>
<tr>
<td>Electrical</td>
<td>Voltage rating</td>
<td>600V RMS</td>
<td></td>
</tr>
<tr>
<td>Vertical Flammability</td>
<td>After burn</td>
<td>0 secs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Burn length</td>
<td>57mm</td>
<td></td>
</tr>
<tr>
<td>60° Flammability</td>
<td>FAA FAR 25 APP.F</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oxygen index</td>
<td>&gt;40%</td>
<td></td>
</tr>
</tbody>
</table>
ORDERING INFORMATION

Colours:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black</td>
</tr>
<tr>
<td>1</td>
<td>Brown</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td>2L</td>
<td>Pink</td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
</tr>
<tr>
<td>7</td>
<td>Violet</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
</tr>
<tr>
<td>9</td>
<td>White</td>
</tr>
<tr>
<td>45</td>
<td>Yellow/Green</td>
</tr>
</tbody>
</table>

Stripes are also available on request and are indicated by additional insulation colour numbers:

e.g. 92 = White with Red stripe

Standard packaging:

300m reels for “standard” items. If the product is a non-stock item a Minimum Order Quantity (MOQ) will apply.

Ordering Description:

Follow steps 1 to 6.

1. Select the type of wire required
2. Select the number of conductors required
3. Select the type of conductor required
4. Select the wire gauge size required
5. Select the primary wire insulation colour(s)
6. Select the outer jacket colour required

Ordering Examples:

- Where a single 26awg 600V white primary wire is required. The part number is **55A0111-26-9**
- Where a single 20awg 600V white primary wire, with shield and an outer white jacket is required. The part number is **55A1111-20-9-9**
- Where two core 450V cable with an overall shield and an outer jacket and a conductor size of 24awg, each with a separate coloured insulation e.g. red and blue. The outer jacket required is white. The part number is **55M1424-24-2/6-9-9**
- Three core 600V cable with an overall shield and an outer jacket with conductor size for each of the primary cores is 18awg, with core insulation colours red, blue and white. Outer jacket is white. The part number is **55A1131-18-2/6/9-9**

ADDITIONAL INFORMATION

The opposite page illustrates how to build your own part number. For further information or assistance please contact us.

Standard Wire Insulation Colours

<table>
<thead>
<tr>
<th>Colour</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black</td>
</tr>
<tr>
<td>1</td>
<td>Brown</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td>2L</td>
<td>Pink</td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
</tr>
<tr>
<td>7</td>
<td>Violet</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
</tr>
<tr>
<td>9</td>
<td>White</td>
</tr>
<tr>
<td>45</td>
<td>Yellow/Green</td>
</tr>
</tbody>
</table>
### Part Numbering example

#### JACKET COLOUR
(codes same as for Primary wire colour below)

<table>
<thead>
<tr>
<th>Code</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black</td>
</tr>
<tr>
<td>1</td>
<td>Brown</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
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<tr>
<td>3</td>
<td>Orange</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>Green</td>
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<tr>
<td>6</td>
<td>Blue</td>
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<tr>
<td>7</td>
<td>Violet</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
</tr>
<tr>
<td>9</td>
<td>White</td>
</tr>
</tbody>
</table>

#### PRIMARY WIRE INSULATION COLOUR

<table>
<thead>
<tr>
<th>Code</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black</td>
</tr>
<tr>
<td>1</td>
<td>Brown</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
</tr>
<tr>
<td>7</td>
<td>Violet</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
</tr>
<tr>
<td>9</td>
<td>White</td>
</tr>
</tbody>
</table>

#### CONDUCTOR SIZE (AWG)

<table>
<thead>
<tr>
<th>Size</th>
<th>30 to 0000</th>
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</thead>
</table>

#### CONDUCTOR TYPE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tin plated copper</td>
</tr>
<tr>
<td>2</td>
<td>Silver plated copper</td>
</tr>
<tr>
<td>3</td>
<td>Nickel plated copper</td>
</tr>
<tr>
<td>4</td>
<td>Silver plated high strength copper alloy</td>
</tr>
<tr>
<td>5</td>
<td>Nickel coated high strength copper alloy</td>
</tr>
<tr>
<td>6</td>
<td>Silver coated ultra HSCA</td>
</tr>
</tbody>
</table>

#### NUMBER of CONDUCTORS

1 through 10 (designator for 10 conductor = 0)

#### VOLTAGE

<table>
<thead>
<tr>
<th>Code</th>
<th>Voltage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>600 volt, lightweight</td>
</tr>
<tr>
<td>2</td>
<td>600 volt, medium weight</td>
</tr>
<tr>
<td>4</td>
<td>450 volt (55M 20-30 AWG only)</td>
</tr>
<tr>
<td>7</td>
<td>1000 volt, heavy duty, airframe</td>
</tr>
<tr>
<td>8</td>
<td>600 volt, normal weight, airframe</td>
</tr>
</tbody>
</table>

#### CONSTRUCTION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Primary wire; or unshielded &amp; unjacketed</td>
</tr>
<tr>
<td>1</td>
<td>Round braid shielded &amp; jacketed</td>
</tr>
<tr>
<td>2</td>
<td>Flat braid shielded &amp; jacketed</td>
</tr>
<tr>
<td>3</td>
<td>Round braid shielded NO jacket</td>
</tr>
<tr>
<td>4</td>
<td>Jacketed NO shield (2 core or more only)</td>
</tr>
<tr>
<td>5</td>
<td>Spiral braid shielded &amp; jacketed</td>
</tr>
<tr>
<td>6-9</td>
<td>Special constructions</td>
</tr>
</tbody>
</table>

#### TYPE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>General purpose</td>
</tr>
<tr>
<td>AC</td>
<td>General purpose, 90% shield coverage</td>
</tr>
<tr>
<td>D</td>
<td>Defence standard 61-12 Part 33</td>
</tr>
<tr>
<td>M</td>
<td>450V (typical application Motorsport)</td>
</tr>
</tbody>
</table>

**BASIC PRODUCT NUMBER**

Spec 55 high performance wire
### 600V Primary Wire, Equipment/Interconnect Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal CSA (mm²)</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>0.06</td>
<td>0.61</td>
<td>0.98</td>
<td>55A0111-30-X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.13</td>
<td>0.09</td>
<td>0.68</td>
<td>1.35</td>
<td>55A0111-28-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>0.16</td>
<td>0.81</td>
<td>2.08</td>
<td>55A0111-26-X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.13</td>
<td>0.24</td>
<td>0.94</td>
<td>2.98</td>
<td>55A0111-24-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>0.38</td>
<td>1.09</td>
<td>4.17</td>
<td>55A0111-22-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>0.62</td>
<td>1.27</td>
<td>6.40</td>
<td>55A0111-20-X</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>0.96</td>
<td>1.52</td>
<td>9.67</td>
<td>55A0111-18-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>1.23</td>
<td>1.73</td>
<td>12.35</td>
<td>55A0111-16-X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
<td>1.94</td>
<td>2.16</td>
<td>19.34</td>
<td>55A0111-14-X</td>
</tr>
<tr>
<td>12</td>
<td>37/0.32</td>
<td>2.97</td>
<td>2.62</td>
<td>29.32</td>
<td>55A0111-12-X</td>
</tr>
</tbody>
</table>

**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 600V Primary Wire, Airframe Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>26*</td>
<td>19/0.10</td>
<td>1.01</td>
<td>2.53</td>
<td>55A0814-26-X</td>
</tr>
<tr>
<td>24*</td>
<td>19/0.13</td>
<td>1.14</td>
<td>3.42</td>
<td>55A0814-24-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>1.27</td>
<td>4.76</td>
<td>55A0811-22-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>1.47</td>
<td>6.99</td>
<td>55A0811-20-X</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>1.78</td>
<td>10.71</td>
<td>55A0811-18-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>1.96</td>
<td>13.39</td>
<td>55A0811-16-X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
<td>2.40</td>
<td>20.54</td>
<td>55A0811-14-X</td>
</tr>
<tr>
<td>12</td>
<td>37/0.32</td>
<td>2.82</td>
<td>30.51</td>
<td>55A0811-12-X</td>
</tr>
<tr>
<td>10</td>
<td>37/0.40</td>
<td>3.40</td>
<td>48.22</td>
<td>55A0811-10-X</td>
</tr>
<tr>
<td>08</td>
<td>133/0.29</td>
<td>4.20</td>
<td>89.72</td>
<td>55A0811-08-X</td>
</tr>
</tbody>
</table>

**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 450V Primary Wire, Light Weight Equipment Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>0.51</td>
<td>0.87</td>
<td>55M0414-30-X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.12</td>
<td>0.58</td>
<td>1.19</td>
<td>55M0414-28-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>0.69</td>
<td>1.80</td>
<td>55M0414-26-X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>0.81</td>
<td>2.68</td>
<td>55M0414-24-X</td>
</tr>
</tbody>
</table>

**Note**: 55M0414 constructions are ideally suited for the performance demands of the Motorsport industry.
### 600V Twisted Pair, Equipment/Interconnect Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>1.22</td>
<td>1.94</td>
<td>55A0121-30-X/X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.13</td>
<td>1.37</td>
<td>2.68</td>
<td>55A0121-28-X/X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>1.63</td>
<td>4.32</td>
<td>55A0121-26-X/X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.13</td>
<td>1.88</td>
<td>6.11</td>
<td>55A0121-24-X/X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>2.18</td>
<td>8.64</td>
<td>55A0121-22-X/X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>2.54</td>
<td>13.38</td>
<td>55A0121-20-X/X</td>
</tr>
<tr>
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<td>20.20</td>
<td>55A0121-18-X/X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>3.45</td>
<td>25.80</td>
<td>55A0121-16-X/X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
<td>4.32</td>
<td>39.67</td>
<td>55A0121-14-X/X</td>
</tr>
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<td>60.10</td>
<td>55A0121-12-X/X</td>
</tr>
</tbody>
</table>

**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 600V Twisted Pair, Airframe Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>26*</td>
<td>19/0.10</td>
<td>2.03</td>
<td>5.29</td>
<td>55A0824-26-X/X</td>
</tr>
<tr>
<td>24*</td>
<td>19/0.13</td>
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<td>6.30</td>
<td>55A0824-24-X/X</td>
</tr>
<tr>
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<td>19/0.16</td>
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<td>10.08</td>
<td>55A0821-22-X/X</td>
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<tr>
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<td>14.40</td>
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</tr>
<tr>
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<td>19/0.25</td>
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<td>22.76</td>
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</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>3.91</td>
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<td>55A0821-16-X/X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
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<td>43.22</td>
<td>55A0821-14-X/X</td>
</tr>
<tr>
<td>12</td>
<td>37/0.32</td>
<td>5.64</td>
<td>61.24</td>
<td>55A0821-12-X/X</td>
</tr>
<tr>
<td>10</td>
<td>37/0.40</td>
<td>6.81</td>
<td>96.94</td>
<td>55A0821-10-X/X</td>
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</table>

**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 450V Twisted Pair, Light Weight Equipment Dimensions

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>1.03</td>
<td>1.77</td>
<td>55M0424-30-X/X</td>
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<tr>
<td>28</td>
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<td>1.17</td>
<td>2.42</td>
<td>55M0424-28-X/X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>1.37</td>
<td>3.66</td>
<td>55M0424-26-X/X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>1.63</td>
<td>5.44</td>
<td>55M0424-24-X/X</td>
</tr>
</tbody>
</table>

**Note**: 55M0424 constructions are ideally suited for the performance demands of the Motorsport industry.
## 55 Wire
*Single or Dual Wall 200°C rated, XLETFE*  
*High performance wire and cable*

### 600V Single Core Screened & Jacketed, Equipment/Interconnect

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
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</thead>
<tbody>
<tr>
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<td>6.84</td>
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</tr>
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<td>19/0.13</td>
<td>1.78</td>
<td>8.20</td>
<td>55A1111-24-X-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>1.93</td>
<td>10.33</td>
<td>55A1111-22-X-X</td>
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<tr>
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<tr>
<td>18</td>
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<td>19/0.29</td>
<td>2.59</td>
<td>21.73</td>
<td>55A1111-16-X-X</td>
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<tr>
<td>14</td>
<td>19/0.36</td>
<td>3.02</td>
<td>30.36</td>
<td>55A1111-14-X-X</td>
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<tr>
<td>12</td>
<td>37/0.32</td>
<td>3.48</td>
<td>42.41</td>
<td>55A1111-12-X-X</td>
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### 600V Single Core Screened & Jacketed, Airframe

<table>
<thead>
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<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>26*</td>
<td>19/0.10</td>
<td>1.85</td>
<td>7.88</td>
<td>55A1814-26-X-X</td>
</tr>
<tr>
<td>24*</td>
<td>19/0.13</td>
<td>1.98</td>
<td>9.37</td>
<td>55A1814-24-X-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>2.13</td>
<td>11.75</td>
<td>55A1811-22-X-X</td>
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<tr>
<td>20</td>
<td>19/0.20</td>
<td>2.34</td>
<td>14.88</td>
<td>55A1811-20-X-X</td>
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<tr>
<td>18</td>
<td>19/0.25</td>
<td>2.62</td>
<td>19.79</td>
<td>55A1811-18-X-X</td>
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<tr>
<td>16</td>
<td>19/0.29</td>
<td>2.82</td>
<td>23.81</td>
<td>55A1811-16-X-X</td>
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*Note*: Conductor type Silver plated high strength copper alloy (SPHCA).

### 450V Single Core Screened & Jacketed, Light Weight Equipment

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>1.17</td>
<td>3.61</td>
<td>55M1414-30-X-X</td>
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<tr>
<td>28</td>
<td>7/0.12</td>
<td>1.24</td>
<td>4.12</td>
<td>55M1414-28-X-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>1.34</td>
<td>4.92</td>
<td>55M1414-26-X-X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>1.47</td>
<td>6.50</td>
<td>55M1414-24-X-X</td>
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</tbody>
</table>

*Note*: 55M1414 constructions are ideally suited for the performance demands of the Motorsport industry.
### 600V 2-Core Screened & Jacketed, Equipment/Interconnect

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>2.06</td>
<td>8.03</td>
<td>55A1121-30-X/X-X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.13</td>
<td>2.21</td>
<td>9.37</td>
<td>55A1121-28-X/X-X</td>
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<tr>
<td>26</td>
<td>19/0.10</td>
<td>2.46</td>
<td>11.75</td>
<td>55A1121-26-X/X-X</td>
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<tr>
<td>24</td>
<td>19/0.13</td>
<td>2.72</td>
<td>14.58</td>
<td>55A1121-24-X/X-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>3.02</td>
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</tr>
<tr>
<td>20</td>
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<td>3.43</td>
<td>24.10</td>
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<tr>
<td>18</td>
<td>19/0.25</td>
<td>3.94</td>
<td>32.63</td>
<td>55A1121-18-X/X-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>4.34</td>
<td>39.73</td>
<td>55A1121-16-X/X-X</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
<td>5.21</td>
<td>57.13</td>
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<td>12</td>
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<td>55A1121-12-X/X-X</td>
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</table>

**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 600V 2-Core Screened & Jacketed, Airframe

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>19/0.10</td>
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<td>55A1824-26-X/X-X</td>
</tr>
<tr>
<td>24*</td>
<td>19/0.13</td>
<td>3.12</td>
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<td>55A1824-24-X/X-X</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>3.43</td>
<td>20.68</td>
<td>55A1821-22-X/X-X</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>3.84</td>
<td>27.08</td>
<td>55A1821-20-X/X-X</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>4.39</td>
<td>36.45</td>
<td>55A1821-18-X/X-X</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>4.80</td>
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**Note**: Conductor type Silver plated high strength copper alloy (SPHSCA).

### 450V 2-Core Screened & Jacketed, Light Weight Equipment

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>1.68</td>
<td>5.51</td>
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</tr>
<tr>
<td>28</td>
<td>7/0.12</td>
<td>1.82</td>
<td>6.72</td>
<td>55M1424-28-X/X-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>2.02</td>
<td>8.93</td>
<td>55M1424-26-X/X-X</td>
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<tr>
<td>24</td>
<td>19/0.12</td>
<td>2.28</td>
<td>11.54</td>
<td>55M1424-24-X/X-X</td>
</tr>
</tbody>
</table>

**Note**: 55M1414 constructions are ideally suited for the performance demands of the Motorsport industry.
# 55 Wire

Single or Dual Wall 200°C rated, XLETFE
High performance wire and cable

## 600V Three Core Screened & Jacketed, Equipment/Interconnect

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>2.16</td>
<td>9.54</td>
<td>55A1131-30-X/X/X-X</td>
</tr>
<tr>
<td>28</td>
<td>7/0.13</td>
<td>2.31</td>
<td>11.33</td>
<td>55A1131-28-X/X/X-X</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>2.59</td>
<td>14.47</td>
<td>55A1131-26-X/X/X-X</td>
</tr>
<tr>
<td>24</td>
<td>19/0.13</td>
<td>2.87</td>
<td>18.34</td>
<td>55A1131-24-X/X/X-X</td>
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<td>22</td>
<td>19/0.16</td>
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<td>23.71</td>
<td>55A1131-22-X/X/X-X</td>
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<td>20</td>
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<td>32.36</td>
<td>55A1131-20-X/X/X-X</td>
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<td>4.19</td>
<td>45.34</td>
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<tr>
<td>16</td>
<td>19/0.29</td>
<td>4.62</td>
<td>55.78</td>
<td>55A1131-16-X/X/X-X</td>
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<td>14</td>
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<td>80.53</td>
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<td>6.60</td>
<td>115.58</td>
<td>55A1131-12-X/X/X-X</td>
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</table>
55D wire is an Aerospace wire, a range of which is held in stock by IS-Group to service the needs of the UK Aerospace and Defence Market. These products are manufactured and released in accordance with the latest Defence Standard 61-12 part 33/001 with a temperature rating of -65°C up to +150°C.

*Note: The 135°C rated single wire without screen or jacket is no longer in the Defence Standard for sizes 001 and 002. For these constructions use the 150°C rated construction 55D0110-24-9 with copper alloy conductor.

### Primary Equipment Wire

<table>
<thead>
<tr>
<th>Part Number</th>
<th>NATO Stock Number</th>
<th>Defence Reference</th>
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</thead>
<tbody>
<tr>
<td>55D0110-24-9*</td>
<td>6145-99-038-4091</td>
<td>DSP33/001-1S-002-1U</td>
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<tr>
<td>55D0111-22-9</td>
<td>6145-99-038-3954</td>
<td>DSP33/001-1T-004-1U</td>
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<td>55D0111-20-9</td>
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### Primary Airframe Wire

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<tr>
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### Single Screened & Jacketed Airframe Cable

<table>
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<tbody>
<tr>
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<td>6145-99-038-4017</td>
<td>DSP33/001-1P-002-1SJ</td>
</tr>
<tr>
<td>55D1111-22-9-9</td>
<td>6145-99-038-4018</td>
<td>DSP33/001-1T-004-1SJ</td>
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### Twisted Pair Screened & Jacketed Airframe Cable

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<th>Defence Reference</th>
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<tbody>
<tr>
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<td>6145-99-038-4025</td>
<td>DSP33/001-1P-002-2SJ</td>
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<td>6145-99-038-4026</td>
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<td>6145-99-038-4027</td>
<td>DSP33/001-1T-006-2SJ</td>
</tr>
</tbody>
</table>

www.is-rayfast.com
99M Wire
Dual Wall 120°C rated wire, Modified Polyester
Low fire hazard wire and cable

Type 99M wire has a dual wall construction of radiation cross-linked modified polyester. This combines excellent mechanical performance and chemical resistance with a range of enhanced fire hazard properties. Type 99M wire is designed to meet the stringent low fire hazard performance being specified by the UK Naval Defence Standard Authority for ship wiring and cabling.

Designed to be compatible with modern wiring and harnessing techniques. It is a flexible wire with virtually no spring back once set. It is easily stripped with tools such as conventional die-blade strippers.

Features & Benefits
- Low flammability
- Low smoke generation
- Low toxicity index
- Low generation of corrosive gases
- Small size, lightweight

Operating Temperature
- -55°C to +105°C jacketed cable
- -55°C to +120°C wire only

Specifications/Approvals
- Def Stan 61-12, Part 18
- Raychem WCD 281

Spec 99 Wire Construction
A wide range of 99 spec wire constructions are available, the most commonly used are:

99M011X (600 V) - Primary Wire

99M1111 - Shielded and jacketed

99M1121 - Shielded and Jacketed Twisted Pair

Note
99 Wire is available in a variety of constructions, voltage ratings, sizes and colours. For further assistance regarding your specific wire and cable requirements, please contact us.
### 99M Wire
Dual Wall 120°C rated wire, Modified Polyester
Low fire hazard wire and cable

<table>
<thead>
<tr>
<th>Product Characteristics</th>
<th>Product Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical</strong></td>
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<tr>
<td>Test</td>
<td>Method</td>
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<tr>
<td>Temperature rating</td>
<td>BS 3G230</td>
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<tr>
<td>Tensile strength</td>
<td>-</td>
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<tr>
<td>Elongation at break</td>
<td>-</td>
</tr>
<tr>
<td>Notch propagation</td>
<td>BS 3G230</td>
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<tr>
<td>Shrinkage 150°C</td>
<td>BS 3G230</td>
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<tr>
<td>Low temperature bend</td>
<td>BS 3G230</td>
</tr>
<tr>
<td>Voltage withstand</td>
<td>BS 3G230</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>BS 3G230</td>
</tr>
<tr>
<td>Pliability rating</td>
<td>Def Stan 61-12 (18)</td>
</tr>
<tr>
<td><strong>Fluid Resistance</strong></td>
<td></td>
</tr>
<tr>
<td>Fuels - aircraft</td>
<td>Def Stan 61-12 (18)</td>
</tr>
<tr>
<td>Oils - ASTM No.3</td>
<td>Def Stan 61-12 (18)</td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
</tr>
<tr>
<td>Voltage rating</td>
<td>-</td>
</tr>
<tr>
<td>Voltage rating</td>
<td>-</td>
</tr>
<tr>
<td><strong>Fire Hazard Properties</strong></td>
<td></td>
</tr>
<tr>
<td>Flammability</td>
<td>BS 3G230</td>
</tr>
<tr>
<td>Toxicity index</td>
<td>Def Stan 61-12 (18)</td>
</tr>
<tr>
<td>Smoke index</td>
<td>Def Stan 61-12 (18)</td>
</tr>
<tr>
<td>Acid gas equivalent</td>
<td>TDE 76/P/76</td>
</tr>
</tbody>
</table>
99M Wire
Building Your Part Number
Low fire hazard wire and cable

Part Numbering example

JACKET COLOUR
0  Black supplied as standard (codes same as for Primary wire colour below)

PRIMARY WIRE INSULATION COLOUR
0  Black  5  Green
1  Brown  6  Blue
2  Red  7  Violet
2L  Pink  8  Grey
3  Orange  9  White
4  Yellow  45  Yellow/Green

CONDUCTOR SIZE (AWG)
28 to 12

CONDUCTOR TYPE
1  Tin plated copper
9  Bare copper

NUMBER of CONDUCTORS
1 through 10 (designator for 10 conductor = 0)

VOLTAGE
1  600 volt, lightweight equipment wire

CONSTRUCTION
0  Primary wire; or unshielded & unjacketed
1  Round braid shielded & jacketed
9  Special constructions

TYPE
M  Military wire

BASIC PRODUCT NUMBER
Spec 99 LFH High performance wire

Standard packaging:
99 Wire is supplied on a range of reel sizes, dependent on gauge size. If the product is a non stock item a Minimum Order Quantity (MOQ) will apply.
### 600V Primary Wire Dimensions (all dimensions are in mm)

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal CSA (mm²)</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>7/0.12</td>
<td>0.09</td>
<td>0.72</td>
<td>1.50</td>
<td>99M0111-28-0</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>0.15</td>
<td>0.90</td>
<td>2.18</td>
<td>99M0111-26-0</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>0.25</td>
<td>0.98</td>
<td>3.45</td>
<td>99M0111-24-0</td>
</tr>
<tr>
<td>22</td>
<td>19/0.15</td>
<td>0.40</td>
<td>1.13</td>
<td>4.90</td>
<td>99M0111-22-0</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>0.60</td>
<td>1.40</td>
<td>7.56</td>
<td>99M0111-20-0</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>1.00</td>
<td>1.65</td>
<td>10.40</td>
<td>99M0111-18-0</td>
</tr>
<tr>
<td>16</td>
<td>19/0.30</td>
<td>1.25</td>
<td>1.90</td>
<td>16.50</td>
<td>99M0111-16-0</td>
</tr>
<tr>
<td>14</td>
<td>37/0.25</td>
<td>2.00</td>
<td>2.25</td>
<td>20.70</td>
<td>99M0111-14-0</td>
</tr>
<tr>
<td>12</td>
<td>37/0.30</td>
<td>3.00</td>
<td>2.60</td>
<td>27.10</td>
<td>99M0111-12-0</td>
</tr>
</tbody>
</table>

### 600V Single Core Screened & Jacketed Dimensions (all dimensions are in mm)

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>1.80</td>
<td>8.29</td>
<td>99M1111-26-X-0</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>1.90</td>
<td>9.80</td>
<td>99M1111-24-X-0</td>
</tr>
<tr>
<td>22</td>
<td>19/0.15</td>
<td>2.05</td>
<td>12.00</td>
<td>99M1111-22-X-0</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>2.30</td>
<td>16.00</td>
<td>99M1111-20-X-0</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>2.55</td>
<td>21.30</td>
<td>99M1111-18-X-0</td>
</tr>
<tr>
<td>16</td>
<td>19/0.30</td>
<td>2.95</td>
<td>29.20</td>
<td>99M1111-16-X-0</td>
</tr>
<tr>
<td>14</td>
<td>37/0.25</td>
<td>3.13</td>
<td>34.80</td>
<td>99M1111-14-X-0</td>
</tr>
<tr>
<td>12</td>
<td>37/0.30</td>
<td>3.48</td>
<td>43.10</td>
<td>99M1111-12-X-0</td>
</tr>
</tbody>
</table>

### 600V 2-Core Screened & Jacketed Dimensions (all dimensions are in mm)

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Stranding No/mm</th>
<th>Nominal Dia. (mm)</th>
<th>Max Weight (g/m)</th>
<th>Ordering Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>7/0.10</td>
<td>2.49</td>
<td>11.66</td>
<td>99M1121-28-X/X-0</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>2.79</td>
<td>15.82</td>
<td>99M1121-26-X/X-0</td>
</tr>
<tr>
<td>24</td>
<td>19/0.12</td>
<td>2.99</td>
<td>17.82</td>
<td>99M1121-24-X/X-0</td>
</tr>
<tr>
<td>22</td>
<td>19/0.15</td>
<td>3.29</td>
<td>22.11</td>
<td>99M1121-22-X/X-0</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>3.84</td>
<td>30.04</td>
<td>99M1121-20-X/X-0</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>4.34</td>
<td>38.14</td>
<td>99M1121-18-X/X-0</td>
</tr>
<tr>
<td>16</td>
<td>19/0.30</td>
<td>4.84</td>
<td>52.91</td>
<td>99M1121-16-X/X-0</td>
</tr>
<tr>
<td>14</td>
<td>37/0.25</td>
<td>5.54</td>
<td>64.86</td>
<td>99M1121-14-X/X-0</td>
</tr>
<tr>
<td>12</td>
<td>37/0.30</td>
<td>6.24</td>
<td>81.38</td>
<td>99M1121-12-X/X-0</td>
</tr>
</tbody>
</table>
100 Wire
Halogen Free, Low Smoke
Introduction

Range of high performance wire and cable that meet the demanding requirements of various standards including German Specification VG 95218-20 (100G wire) and European Rail standard EN50306 (100E wire).

Characteristics include being extremely flexible, tough and resistant to a variety of fluids meeting the limited fire hazard requirements. Insulation materials are mechanically strong and durable whilst being smaller and lighter.

Zero Halogen, light weight wire and cable for signal and equipment wire for low voltage applications.

The construction is a dual wall combination of formulated polymer blends. Developed to meet demanding specification requirements, whilst maintaining the desirable features of small size, lightweight, flexibility and non-wrinkling.

Product Features
• Zero halogen, thin wall, high temperature
• Small size and lightweight
• Excellent handling and flexibility
• Outstanding resistance to oils, plus scrape abrasion and cut through.
• Voltage rating: 300V and 750V.
• Conductor cores 0.5mm² to 2.5mm².
• Continuous operating temperature: Wire; -55°C to +125°C
  Cable: -30°C to +105°C
• Dual wall construction

100E Wire Approvals
EN50306-2 Thin wall single core wires, 300 volts.
EN50306-3 Single core and multi-core cables (pairs, triples and quads) screened and thin wall sheathed.
EN50306-4 Multi-core and Multi-pair cables standard wall sheathed, screened or unscreened (thicker outer jacket).

100G Wire Approvals
Meets requirements of VG 95218-20 Type E primary wire.

50% Volume Reduction
30% Weight Reduction

Compared to conventional wire

100 Wire
Conventional Wire
15mm
22mm

35 x 1mm² wires > 50% reduction in bulk of wiring and > 30% reduction in the weight of wiring

Conventional cables use filled soft polymer insulations, which by the nature of the insulation have to be thick wall. 100E wire uses engineered polymers to greatly reduce wall thickness by ~5 times.
Part Numbering example

Outer Jacket Colour
0 = Black

Core Insulation Colour
9 = White, available for 100E
All standard colours available for 100G wire

Conductor Size
0.15mm² to 4.00mm²

Conductor Type
1 = Tin Plated Copper

Number of Conductors
1 to 4 for 100E wire and cable
1 through 10 (designator for 10 conductors = 0)

100E Class of Wire
1 = 300V

100G Class of Wire
1 = 750V/1300V equipment wire

Constructions
0 = Primary wire plus unscreened and
unjacketed cables
1 = Round braid, screened & jacketed
4 = Jacketed, no screen

Base Wire
Spec 100E - Approved to EN50306 Rail
Spec 100G - Available to VG 95218
### 100G Fire Hazard Properties

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity</td>
<td>Def. Standard 02-713</td>
<td>3.5</td>
</tr>
<tr>
<td>Smoke Density</td>
<td>IEC 1034 part 1 and 2</td>
<td>95% light transmittance</td>
</tr>
<tr>
<td>Halogen content</td>
<td>DIN VDE 0472 pt 815</td>
<td>Non-detected</td>
</tr>
<tr>
<td>Corrosivity of combustion gasses</td>
<td>DIN VDE 0472 part 813, IEC 754-2</td>
<td>5.0 pH, &lt;4 µS/mm conductivity</td>
</tr>
<tr>
<td>Flammability</td>
<td>VG 95218 part 2</td>
<td>&lt; 15 sec after burn, &lt; 150 mm burn length</td>
</tr>
</tbody>
</table>

### 100G Ordering Information

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Conductor Stranding No./Diam</th>
<th>Max. Diameter</th>
<th>Max. Resistance @ 20ºC</th>
<th>Max. Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100G0111-0.15-*</td>
<td>0.15 mm²</td>
<td>19/0.10 mm</td>
<td>0.50 mm</td>
<td>133.0 Ω/km</td>
<td>1.08 mm</td>
<td>2.59 kg/km</td>
</tr>
<tr>
<td>100G0111-0.25-*</td>
<td>0.25 mm²</td>
<td>19/0.13 mm</td>
<td>0.63 mm</td>
<td>83.3 Ω/km</td>
<td>1.19 mm</td>
<td>3.59 kg/km</td>
</tr>
<tr>
<td>100G0111-0.40-*</td>
<td>0.40 mm²</td>
<td>19/0.16 mm</td>
<td>0.79 mm</td>
<td>50.5 Ω/km</td>
<td>1.38 mm</td>
<td>5.18 kg/km</td>
</tr>
<tr>
<td>100G0111-0.50-*</td>
<td>0.50 mm²</td>
<td>19/0.18 mm</td>
<td>0.90 mm</td>
<td>40.1 Ω/km</td>
<td>1.45 mm</td>
<td>6.60 kg/km</td>
</tr>
<tr>
<td>100G0111-0.60-*</td>
<td>0.60 mm²</td>
<td>19/0.20 mm</td>
<td>1.01 mm</td>
<td>31.1 Ω/km</td>
<td>1.57 mm</td>
<td>7.40 kg/km</td>
</tr>
<tr>
<td>100G0111-0.75-*</td>
<td>0.75 mm²</td>
<td>19/0.23 mm</td>
<td>1.15 mm</td>
<td>24.7 Ω/km</td>
<td>1.65 mm</td>
<td>8.90 kg/km</td>
</tr>
<tr>
<td>100G0111-1.00-*</td>
<td>1.00 mm²</td>
<td>19/0.25 mm</td>
<td>1.26 mm</td>
<td>20.0 Ω/km</td>
<td>1.80 mm</td>
<td>10.70 kg/km</td>
</tr>
<tr>
<td>100G0111-1.20-*</td>
<td>1.20 mm²</td>
<td>19/0.29 mm</td>
<td>1.42 mm</td>
<td>15.3 Ω/km</td>
<td>1.98 mm</td>
<td>13.60 kg/km</td>
</tr>
<tr>
<td>100G0111-1.50-*</td>
<td>1.50 mm²</td>
<td>37/0.23 mm</td>
<td>1.58 mm</td>
<td>12.9 Ω/km</td>
<td>2.13 mm</td>
<td>16.00 kg/km</td>
</tr>
<tr>
<td>100G0111-2.00-*</td>
<td>2.00 mm²</td>
<td>37/0.25 mm</td>
<td>1.82 mm</td>
<td>9.8 Ω/km</td>
<td>2.41 mm</td>
<td>20.30 kg/km</td>
</tr>
<tr>
<td>100G0111-2.50-*</td>
<td>2.50 mm²</td>
<td>37/0.29 mm</td>
<td>2.01 mm</td>
<td>8.0 Ω/km</td>
<td>2.63 mm</td>
<td>25.70 kg/km</td>
</tr>
<tr>
<td>100G0111-3.00-*</td>
<td>3.00 mm²</td>
<td>37/0.32 mm</td>
<td>2.24 mm</td>
<td>6.4 Ω/km</td>
<td>2.86 mm</td>
<td>31.00 kg/km</td>
</tr>
<tr>
<td>100G0111-4.00-*</td>
<td>4.00 mm²</td>
<td>56/0.30 mm</td>
<td>2.57 mm</td>
<td>4.9 Ω/km</td>
<td>3.17 mm</td>
<td>43.60 kg/km</td>
</tr>
</tbody>
</table>
### 100E Fire Hazard Properties

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame Propagation - Single cable</td>
<td>IEC 60332-1-2</td>
<td>Charring confined 50-540mm</td>
</tr>
<tr>
<td>Flame Propagation - Bunched Cable (d ≥ 12mm)</td>
<td>IEC 60332-3-24</td>
<td>Max. burn length 2.5m</td>
</tr>
<tr>
<td>Flame Propagation - Bunched Cable (&gt;6mm/&lt;12mm)</td>
<td>EN 50305 Clause 9.1.1</td>
<td>Max burn length 2.5m</td>
</tr>
<tr>
<td>Flame Propagation - Bunched Cable (d ≤ 6mm)</td>
<td>EN 50305 Clause 9.1.2</td>
<td>Max burn length 1.5m</td>
</tr>
<tr>
<td>Smoke Testing</td>
<td>EN 61034-2</td>
<td>3m cube 90% min. transmittance</td>
</tr>
<tr>
<td>Toxicity</td>
<td>EN 50305 Clause 9.2</td>
<td>Index max.6</td>
</tr>
<tr>
<td>Fluorine Content</td>
<td>IEC 60684-2 CI 45.2</td>
<td>&lt;0.1% Fluorine</td>
</tr>
<tr>
<td>Evolution of HCL</td>
<td>EN 60754-1</td>
<td>&lt;0.5% HCL</td>
</tr>
<tr>
<td>Acid Gas Emission</td>
<td>EN 60754-2</td>
<td>pH &gt;4.3 conductivity &lt;10µS/mm</td>
</tr>
</tbody>
</table>

### 100E EN50306-2 Thin Wall Single Core Wires 300 volts

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Conductor Stranding No./Diam</th>
<th>Max. Diameter</th>
<th>Max. Resistance @ 20ºC</th>
<th>Max. Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100E0111-0.50-X</td>
<td>0.50 mm²</td>
<td>19/0.18 mm</td>
<td>0.90 mm</td>
<td>40.1 Ω/km</td>
<td>1.45 mm</td>
<td>6.60 kg/km</td>
</tr>
<tr>
<td>100E0111-0.75-X</td>
<td>0.75 mm²</td>
<td>19/0.23 mm</td>
<td>1.15 mm</td>
<td>26.7 Ω/km</td>
<td>1.65 mm</td>
<td>8.90 kg/km</td>
</tr>
<tr>
<td>100E0111-1.00-X</td>
<td>1.00 mm²</td>
<td>19/0.25 mm</td>
<td>1.26 mm</td>
<td>20.0 Ω/km</td>
<td>1.80 mm</td>
<td>10.7 kg/km</td>
</tr>
<tr>
<td>100E0111-1.50-X</td>
<td>1.50 mm²</td>
<td>37/0.23 mm</td>
<td>1.58 mm</td>
<td>13.7 Ω/km</td>
<td>2.13 mm</td>
<td>16.0 kg/km</td>
</tr>
<tr>
<td>100E0111-2.50-X</td>
<td>2.50 mm²</td>
<td>37/0.29 mm</td>
<td>2.01 mm</td>
<td>8.21 Ω/km</td>
<td>2.63 mm</td>
<td>25.7 kg/km</td>
</tr>
</tbody>
</table>

### 100E EN50306-3 Single Core Cables, Screened and Thin Wall Sheathed

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Shield Size</th>
<th>Jacket Thickness Min.</th>
<th>Nom. Overall Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100E1111-0.50-X</td>
<td>0.50 mm²</td>
<td>0.10 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>2.61 mm</td>
</tr>
<tr>
<td>100E1111-0.75-X</td>
<td>0.75 mm²</td>
<td>0.10 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>2.82 mm</td>
</tr>
<tr>
<td>100E1111-1.00-X</td>
<td>1.00 mm²</td>
<td>0.10 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>2.95 mm</td>
</tr>
<tr>
<td>100E1111-1.50-X</td>
<td>1.50 mm²</td>
<td>0.10 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>3.28 mm</td>
</tr>
<tr>
<td>100E1111-2.50-X</td>
<td>2.50 mm²</td>
<td>0.10 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>3.88 mm</td>
</tr>
</tbody>
</table>
### 100E Wire

#### Halogen Free, Low Smoke

#### Fire Hazard Properties and Part Numbering

### 100E EN50306-3 Two Core Cables, Screened and Thin Wall Sheathed

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Shield Size</th>
<th>Jacket Thickness</th>
<th>Nom. Overall Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100E1121-0.50-X</td>
<td>0.50 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>4.14 mm</td>
</tr>
<tr>
<td>100E1121-0.75-X</td>
<td>0.75 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>4.56 mm</td>
</tr>
<tr>
<td>100E1121-1.00-X</td>
<td>1.00 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>4.81 mm</td>
</tr>
<tr>
<td>100E1121-1.50-X</td>
<td>1.50 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>5.48 mm</td>
</tr>
<tr>
<td>100E1121-2.50-X</td>
<td>2.50 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>6.48 mm</td>
</tr>
</tbody>
</table>

### 100E EN50306-3 Three Core Cables, Screened and Thin Wall Sheathed

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Shield Size</th>
<th>Jacket Thickness</th>
<th>Nom. Overall Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100E1131-0.50-X</td>
<td>0.50 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>4.36 mm</td>
</tr>
<tr>
<td>100E1131-0.75-X</td>
<td>0.75 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>4.82 mm</td>
</tr>
<tr>
<td>100E1131-1.00-X</td>
<td>1.00 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>5.09 mm</td>
</tr>
<tr>
<td>100E1131-1.50-X</td>
<td>1.50 mm²</td>
<td>0.13 mm</td>
<td>0.20 mm</td>
<td>0.38 mm</td>
<td>5.81 mm</td>
</tr>
<tr>
<td>100E1131-2.50-X</td>
<td>2.50 mm²</td>
<td>0.13 mm</td>
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</table>

### 100E EN50306-3 Four Core Cables, Screened and Thin Wall Sheathed

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Cross Sectional Area</th>
<th>Shield Size</th>
<th>Jacket Thickness</th>
<th>Nom. Overall Diameter</th>
<th>Max. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100E1141-0.50-X</td>
<td>0.50 mm²</td>
<td>0.13 mm</td>
<td>0.25 mm</td>
<td>0.38 mm</td>
<td>4.72 mm</td>
</tr>
<tr>
<td>100E1141-0.75-X</td>
<td>0.75 mm²</td>
<td>0.13 mm</td>
<td>0.25 mm</td>
<td>0.38 mm</td>
<td>5.22 mm</td>
</tr>
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<td>100E1141-1.00-X</td>
<td>1.00 mm²</td>
<td>0.13 mm</td>
<td>0.30 mm</td>
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</tr>
<tr>
<td>100E1141-1.50-X</td>
<td>1.50 mm²</td>
<td>0.13 mm</td>
<td>0.38 mm</td>
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<td>6.53 mm</td>
</tr>
<tr>
<td>100E1141-2.50-X</td>
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<td>0.13 mm</td>
<td>0.46 mm</td>
<td>0.61 mm</td>
<td>7.96 mm</td>
</tr>
</tbody>
</table>

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**Wire and Cable**
EN50306-4 Multi-Core and Multi-Pair Cables, Screened and Standard Wall Sheathed

Custom designed cables (specials). Due to the potential number of parts possible, these will be created as EPD cables. Rail specifications EN50306-4 multi-core and multi-pair cables are standard wall sheathed.

- Unscreened, sheathed for either exposed or protected wiring (0.5mm² to 2.50 mm², number of cores from 2 to 48). Conforms with table 1 of EN50306-4 (Class 1P or 1E)
- Screened, sheathed for either exposed or protected wiring (0.5mm² to 2.50 mm², number of cores from 2 to 8). Conforms with table 3 of EN50306-4 (Class 3P or 3E)
- Screened, sheathed for either exposed or protected wiring (0.5mm² to 1.50 mm², number of cores from 2 to 7). Conforms with table 3 of EN50306-4 (Class 5P or 5E)
PTFE Wire

NEMA HP3 (MIL-W-16878) and BS 3G 210

Equipment wire

Polytetrafluoroethylene (PTFE) is a fluorocarbon polymer insulation material that allows wiring systems to be used and operated in the most demanding of environments.

PTFE is resistant to lubricants and fuels, very flexible, plus it has excellent thermal and electrical properties. Particularly suitable for applications requiring high levels of thermal and chemical resistance.

Features & Benefits

• Mechanically tough and flexible
• Excellent temperature performance
• Very high dielectric performance
• Non flammable / Flame resistant
• Excellent chemical resistance
• Silver and Nickel plated conductors
• Water repellent

Operating Temperature BS 3G 210

• -75°C to +190°C (Silver plated copper)
• -75°C to +260°C (Nickel plated copper)

Operating Temperature Nema HP3

• -75°C to +200°C (Silver plated copper)

Voltage Rating

• 250/300, 600 & 1000 volts

Specifications/Approvals

• BS 3G 210 Type A, B and C
• Nema HP3 Type ET, E and EE (formerly known as MIL-W-16878)

For more information on the current PTFE stock profile, technical data, or assistance with your specific PTFE wire and cable requirements, please contact us.

BS 3G 210 Equipment Wire

<table>
<thead>
<tr>
<th>BS 3G 210</th>
<th>Voltage Rating (RMS)</th>
<th>Conductor Plating</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE A</td>
<td>300 V</td>
<td>Silver A</td>
</tr>
<tr>
<td>TYPE B</td>
<td>600 V</td>
<td>Silver B</td>
</tr>
<tr>
<td>TYPE C</td>
<td>1000 V</td>
<td>Silver C, Nickel</td>
</tr>
</tbody>
</table>

Nema HP3 Equipment Wire

<table>
<thead>
<tr>
<th>Nema HP3 (MIL-W-16878)</th>
<th>Voltage Rating (RMS)</th>
<th>Nema HP3 Replaces Mil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type ET</td>
<td>250 V</td>
<td>MIL-W-16878/6</td>
</tr>
<tr>
<td>Type E</td>
<td>600 V</td>
<td>MIL-W-16878/4</td>
</tr>
<tr>
<td>Type EE</td>
<td>1000 V</td>
<td>MIL-W-16878/5</td>
</tr>
</tbody>
</table>

RoHS compliant
### BS 3G 210 Part Numbering

**BS 3G210-A-20(19/0.20)-6** example

<table>
<thead>
<tr>
<th>BS 3G210 Type</th>
<th>Strands</th>
<th>A/NA</th>
<th>B/NB</th>
<th>C/NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 300V Silver</td>
<td>7/0.080</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>B 600V Silver</td>
<td>1/0.250</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 1000V Silver</td>
<td>7/0.100</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>D 7/0.120</td>
<td>1/0.320</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 19/0.100</td>
<td>7/0.200</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>F 19/0.120</td>
<td>1/0.600</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G 19/0.150</td>
<td>1/0.900</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H 19/0.200</td>
<td>19/0.080</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>I 19/0.250</td>
<td>19/0.100</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>J 19/0.300</td>
<td>19/0.120</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>K 19/0.335</td>
<td>19/0.450</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L 19/0.400</td>
<td>37/0.400</td>
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### Nema HP3 Part Numbering

**HP3-EXBGE9** example

<table>
<thead>
<tr>
<th>NEMA Type</th>
<th>Construction</th>
<th>Conductor Material</th>
<th>AWG Size</th>
<th>Stranding</th>
<th>Colour Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET 250 V</td>
<td>Wrapped</td>
<td>Silver plated Cu</td>
<td>A 32</td>
<td>H 18</td>
<td>0 Black</td>
</tr>
<tr>
<td>E 600 V</td>
<td>Extruded</td>
<td>Nickel plated Cu</td>
<td>B 30</td>
<td>J 16</td>
<td>1 Brown</td>
</tr>
<tr>
<td>EE 1000 V</td>
<td></td>
<td>Silver plated high strength Cu alloy</td>
<td>C 28</td>
<td>K 14</td>
<td>2 Red</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nickel plated high strength Cu alloy</td>
<td>D 26</td>
<td>L 12</td>
<td>3 Orange</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silver plated Cu clad steel</td>
<td>E 24</td>
<td>M 10</td>
<td>4 Yellow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nickel plated Cu clad steel</td>
<td>F 22</td>
<td>N 8</td>
<td>5 Green</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 20</td>
<td>P 6</td>
<td>6 Blue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 Violet</td>
</tr>
</tbody>
</table>

### Colour Codes

- 0 Black
- 1 Brown
- 2 Red
- 3 Orange
- 4 Yellow
- 5 Green
- 6 Blue
- 7 Violet
- 8 Grey
- 9 White
- 2L Pink
- 133 T
- 665 V
- 817 W
- 1045 S
- 1330 T
- 1672 V
- 2109 W
- 0000 Z
- 1 Black
- 2 Blue
- 3 Orange
- 4 Yellow
- 5 Green
- 6 Red
- 7 Violet
- 8 Grey
- 9 White
Military and Aerospace Wire

SAE AS22759
SAE AS81044
SAE AS27500

EN Specs Airbus Group
BMS13-XX Boeing

Working closely with partnered QPL’d manufacturers worldwide we offer a comprehensive range of wires and cables, plus associated products for the Defence and Aerospace markets.

Our customer service team includes specialists by sector and by product, to provide the best customer support possible.

We offer a wide selection of military and aerospace specification wires and cables, plus custom designed products.

Our experience and knowledge is able to provide you with advice and support on the best product available for your application, whether it is an off the shelf or a bespoke designed cable.
SAE AS22759 wire is a fluoropolymer insulated single conductor wire that is ideal for a wide variety of military aerospace applications. Since AS22759 wire is built to meet military specifications, it is also the premier choice for many commercial applications.

SAE AS22759 wire boasts high performance and reliability in severe wind and moisture prone (SWAMP) zones such as engine nacelles as well as areas that require overload stability, low smoke emission and fire resistance, such as aircraft cabins.

SAE AS22759 wire can carry up to 1000 volts, and is capable of operating in extreme temperature ranges from -55°C to +260°C.

IS-Group offers many different configurations of AS22759 wire. Choose copper or high strength copper alloy conductors coated with tin, silver, or nickel. We also provide a wide selection of insulation material options to meet your needs.

Some of the distinctive characteristics offered by AS22759 wire are:

- Excellent thermal stability
- High reliability
- High break strength and flex life
- High abrasion resistance
- AS22759 wire is available in sizes ranging from 30 to 0000 AWG.

Note: This specification was formerly listed under MIL-W-22759 and is supplied in full compliance with the SAE AS22759 specification.

Part number example...

**M22759 34 26 9**

- **Colour Code Designator** Per MIL-STD-681
- **Wire Gauge (AWG)**
- **Wire Type** Refer to tables following pages
- **General Specification**
# SAE AS22759 • M22759

**Equipment Wire**  
Military and Commercial Aerospace

## M22759/5 to /12 Extruded PTFE Insulation

<table>
<thead>
<tr>
<th>Reference</th>
<th>M27500 Identifier</th>
<th>Conductor Plating</th>
<th>Insulation</th>
<th>Temp. Rating</th>
<th>Volt. Rating</th>
<th>AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>M22759/5</td>
<td>VA</td>
<td>Silver</td>
<td>Extruded PTFE*</td>
<td>200°C</td>
<td>600 V</td>
<td>24 to 20</td>
</tr>
<tr>
<td>M22759/6</td>
<td>WA</td>
<td>Nickel</td>
<td>Extruded PTFE*</td>
<td>260°C</td>
<td>600 V</td>
<td>24 to 20</td>
</tr>
<tr>
<td>M22759/7</td>
<td>SA</td>
<td>Silver</td>
<td>Extruded PTFE*</td>
<td>200°C</td>
<td>600 V</td>
<td>24 to 8</td>
</tr>
<tr>
<td>M22759/8</td>
<td>TA</td>
<td>Nickel</td>
<td>Extruded PTFE*</td>
<td>260°C</td>
<td>600 V</td>
<td>24 to 8</td>
</tr>
<tr>
<td>M22759/9</td>
<td>LE</td>
<td>Silver</td>
<td>Extruded PTFE</td>
<td>200°C</td>
<td>1000 V</td>
<td>28 to 10</td>
</tr>
<tr>
<td>M22759/10</td>
<td>LH</td>
<td>Nickel</td>
<td>Extruded PTFE</td>
<td>260°C</td>
<td>1000 V</td>
<td>28 to 8</td>
</tr>
<tr>
<td>M22759/11</td>
<td>RC</td>
<td>Silver</td>
<td>Extruded PTFE</td>
<td>200°C</td>
<td>600 V</td>
<td>28 to 8</td>
</tr>
<tr>
<td>M22759/12</td>
<td>RE</td>
<td>Nickel</td>
<td>Extruded PTFE</td>
<td>260°C</td>
<td>600 V</td>
<td>28 to 8</td>
</tr>
</tbody>
</table>

* Denotes mineral filled PTFE insulation

## M22759/13 to /15 Extruded FEP Insulation, with PVDF outer

<table>
<thead>
<tr>
<th>Reference</th>
<th>M27500 Identifier</th>
<th>Conductor Plating</th>
<th>Insulation</th>
<th>Temp. Rating</th>
<th>Volt. Rating</th>
<th>AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>M22759/13</td>
<td>CA</td>
<td>Tin</td>
<td>Extruded FEP/PVDF</td>
<td>135°C</td>
<td>600 V</td>
<td>24 to 10</td>
</tr>
<tr>
<td>M22759/14</td>
<td>CB</td>
<td>Tin</td>
<td>Extruded FEP/PVDF</td>
<td>135°C</td>
<td>600 V</td>
<td>26 to 12</td>
</tr>
<tr>
<td>M22759/15</td>
<td>CC</td>
<td>Silver HSCA</td>
<td>Extruded FEP/PVDF</td>
<td>135°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
</tbody>
</table>

## M22759/16 to /19 Extruded ETFE Insulation

<table>
<thead>
<tr>
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<th>M27500 Identifier</th>
<th>Conductor Plating</th>
<th>Insulation</th>
<th>Temp. Rating</th>
<th>Voltage Rating</th>
<th>AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>M22759/16</td>
<td>TE</td>
<td>Tin</td>
<td>Extruded ETFE</td>
<td>150°C</td>
<td>600 V</td>
<td>24 to 00</td>
</tr>
<tr>
<td>M22759/17</td>
<td>TF</td>
<td>Silver HSCA</td>
<td>Extruded ETFE</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M22759/18</td>
<td>TG</td>
<td>Tin</td>
<td>Extruded ETFE</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td>M22759/19</td>
<td>TH</td>
<td>Silver HSCA</td>
<td>Extruded ETFE</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 20</td>
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</table>
**M22759/20 to /31** Extruded PTFE Insulation

<table>
<thead>
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<th>Reference</th>
<th>M27500 Identifier</th>
<th>Conductor Plating</th>
<th>Insulation</th>
<th>Temp. Rating</th>
<th>Volt. Rating</th>
<th>AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>M22759/20</td>
<td>TK</td>
<td>Silver HSCA</td>
<td>Extruded PTFE</td>
<td>200°C</td>
<td>1000 V</td>
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</tr>
<tr>
<td>M22759/21</td>
<td>TL</td>
<td>Nickel HSCA</td>
<td>Extruded PTFE</td>
<td>260°C</td>
<td>1000 V</td>
<td>28 to 20</td>
</tr>
<tr>
<td>M22759/22</td>
<td>TM</td>
<td>Silver HSCA</td>
<td>Extruded PTFE</td>
<td>200°C</td>
<td>600 V</td>
<td>28 to 20</td>
</tr>
<tr>
<td>M22759/23</td>
<td>TN</td>
<td>Nickel HSCA</td>
<td>Extruded PTFE</td>
<td>260°C</td>
<td>600 V</td>
<td>28 to 20</td>
</tr>
<tr>
<td>M22759/28</td>
<td>JB</td>
<td>Silver</td>
<td>Extruded PTFE/Polyimide</td>
<td>200°C</td>
<td>600 V</td>
<td>28 to 10</td>
</tr>
<tr>
<td>M22759/29</td>
<td>JC</td>
<td>Nickel</td>
<td>Extruded PTFE/Polyimide</td>
<td>260°C</td>
<td>600 V</td>
<td>28 to 10</td>
</tr>
<tr>
<td>M22759/30</td>
<td>JD</td>
<td>Silver HSCA</td>
<td>Extruded PTFE/Polyimide</td>
<td>200°C</td>
<td>600 V</td>
<td>28 to 20</td>
</tr>
<tr>
<td>M22759/31</td>
<td>JE</td>
<td>Nickel HSCA</td>
<td>Extruded PTFE/Polyimide</td>
<td>260°C</td>
<td>600 V</td>
<td>28 to 10</td>
</tr>
</tbody>
</table>

**M22759/32 to /46** Extruded XL-ETFE Insulation

<table>
<thead>
<tr>
<th>Reference</th>
<th>M27500 Identifier</th>
<th>Conductor Plating</th>
<th>Insulation</th>
<th>Temp. Rating</th>
<th>Voltage Rating</th>
<th>AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>M22759/32</td>
<td>SB</td>
<td>Tin</td>
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<td>150°C</td>
<td>600 V</td>
<td>30 to 12</td>
</tr>
<tr>
<td>M22759/33</td>
<td>SC</td>
<td>Silver HSCA</td>
<td>Extruded XL-ETFE</td>
<td>200°C</td>
<td>600 V</td>
<td>30 to 20</td>
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<tr>
<td>M22759/34</td>
<td>SD</td>
<td>Tin</td>
<td>Extruded XL-ETFE Dual Wall*</td>
<td>150°C</td>
<td>600 V</td>
<td>24 to 00</td>
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<tr>
<td>M22759/35</td>
<td>SE</td>
<td>Silver HSCA</td>
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<td>600 V</td>
<td>26 to 20</td>
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<tr>
<td>M22759/41</td>
<td>SM</td>
<td>Nickel</td>
<td>Extruded XL-ETFE Dual Wall*</td>
<td>200°C</td>
<td>600 V</td>
<td>26 to 00</td>
</tr>
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<td>M22759/42</td>
<td>SN</td>
<td>Nickel HSCA</td>
<td>Extruded XL-ETFE Dual Wall</td>
<td>200°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M22759/43</td>
<td>SP</td>
<td>Silver</td>
<td>Extruded XL-ETFE Dual Wall*</td>
<td>200°C</td>
<td>600 V</td>
<td>26 to 00</td>
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<tr>
<td>M22759/44</td>
<td>SR</td>
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<td>28 to 12</td>
</tr>
<tr>
<td>M22759/46</td>
<td>ST</td>
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<td>Extruded XL-ETFE</td>
<td>200°C</td>
<td>600 V</td>
<td>28 to 20</td>
</tr>
</tbody>
</table>

* Denotes polymeric braid as outer sheath on certain sizes
Composite Insulated - Cables address a number of issues associated with Polyimide and XL-ETFE wire and cable. Namely that of insulation thickness and consequent space and weight savings, without sacrificing the mechanical and thermal performance of the wire.

Series /80 to /92 wire offers...

Approximate 5% weight saving over XL-ETFE

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>M22759/80</td>
<td>WB</td>
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<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td>M22759/81</td>
<td>WC</td>
<td>Silver, HSCA</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>200°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M22759/82</td>
<td>WE</td>
<td>Nickel, HSCA</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260°C</td>
<td>600 V</td>
<td>26 to 20</td>
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<tr>
<td>M22759/83</td>
<td>WF</td>
<td>Silver</td>
<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td>200°C</td>
<td>600 V</td>
<td>2 to 0000</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td></td>
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<td></td>
<td>Fluoropolymer/Polyimide, 3 Ply</td>
<td></td>
<td>600 V</td>
<td>8 to 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td>260°C</td>
<td>600 V</td>
<td>4 to 0000</td>
</tr>
<tr>
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<td>WK</td>
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<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260°C</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Fluoropolymer/Polyimide, 3 Ply</td>
<td></td>
<td>600 V</td>
<td>8 to 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td></td>
<td>600 V</td>
<td>4 to 0000</td>
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<td>Fluoropolymer/Polyimide, 3 Ply</td>
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<td>600 V</td>
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<td></td>
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<td></td>
<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td></td>
<td>600 V</td>
<td>4 to 0000</td>
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<td>Fluoropolymer/Polyimide, 2 Ply</td>
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<td>260°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M22759/91</td>
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<td>200°C</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td>M22759/92</td>
<td>WR</td>
<td>Nickel</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260°C</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
</tbody>
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SAE AS22759 • M22759 Composite Taped Equipment Wire
Military and Commercial Aerospace

RoHS compliant
Composite ‘Smooth/Seamless’ - Technological advances in recent years has enabled an improved ‘Smooth’ version of composite taped wires, that offers all the advantages of tape wrap found on the /80 to /92 series but with the smooth appearance and characteristics of an extrusion.

These /180 to /192 series wires offer superior performance characteristics over the 80 to 92 series in that...

### Marking Contrast up by circa 9%

### Scrape Abrasion resistance up by approx 47%

**M22759/180 to /192 Composite Taped Wires ‘Smooth/Seamless’**

<table>
<thead>
<tr>
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<tr>
<td>M22759/181</td>
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<td>M22759/182</td>
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<td>260ºC</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M22759/183</td>
<td>DF</td>
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<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td>200ºC</td>
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<td>2 to 0000</td>
</tr>
<tr>
<td>M22759/184</td>
<td>DG</td>
<td>Nickel</td>
<td>Fluoropolymer/Polyimide, 4 Ply</td>
<td>260ºC</td>
<td>600 V</td>
<td>2 to 0000</td>
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<tr>
<td>M22759/185</td>
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<td>2 to 0000</td>
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<tr>
<td>M22759/186</td>
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<td>Silver</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>200ºC</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
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<td>Nickel</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260ºC</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td>M22759/188</td>
<td>DL</td>
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<td>Fluoropolymer/Polyimide, 2 Ply</td>
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<td>600 V</td>
<td>26 to 10</td>
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<td>M22759/189</td>
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<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>200ºC</td>
<td>600 V</td>
<td>26 to 20</td>
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<tr>
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<td>DN</td>
<td>Nickel, HSCA</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260ºC</td>
<td>600 V</td>
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<tr>
<td>M22759/191</td>
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<td>Silver</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
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<td>600 V</td>
<td>26 to 10</td>
</tr>
<tr>
<td>M22759/192</td>
<td>DR</td>
<td>Nickel</td>
<td>Fluoropolymer/Polyimide, 2 Ply</td>
<td>260ºC</td>
<td>600 V</td>
<td>26 to 10</td>
</tr>
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</table>
SAE AS81044 wire is an extremely versatile and reliable stranded single-conductor insulated lead wire with an impressive operating range of -65°C to 150°C and a maximum voltage rating of 600V. This wire offers a resistance to cut-through, abrasion, cold flow and common chemicals and has low smoke characteristics. This wire is ideal for cable construction, routing in conduits, or in protected areas of avionics and airframe compartments.

Originally developed for military and aerospace applications and is now commonly used in aircraft, ground support equipment, military vehicles, shipboard and missile platforms. This wire offers high density ratios which allow your application to meet strict weight requirements.

There are also various commercial and industry applications for AS81044 like harness wiring or most applications requiring a high density cable.

With conductor coatings including tin and silver, as well as high strength copper alloy,

<table>
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</thead>
<tbody>
<tr>
<td>M81044/5</td>
<td>MD</td>
<td>Silver</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>24 to 0</td>
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<tr>
<td>M81044/6</td>
<td>ME</td>
<td>Tin</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>24 to 0</td>
</tr>
<tr>
<td>M81044/7</td>
<td>MF</td>
<td>Silver, HSCA</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M81044/8</td>
<td>MG</td>
<td>Silver</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>24 to 0</td>
</tr>
<tr>
<td>M81044/9</td>
<td>MH</td>
<td>Tin</td>
<td>Extruded XL-PVDF</td>
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<td>600 V</td>
<td>24 to 0</td>
</tr>
<tr>
<td>M81044/10</td>
<td>MJ</td>
<td>Silver, HSCA</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>26 to 20</td>
</tr>
<tr>
<td>M81044/11</td>
<td>MK</td>
<td>Silver</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>30 to 12</td>
</tr>
<tr>
<td>M81044/12</td>
<td>ML</td>
<td>Tin</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>30 to 12</td>
</tr>
<tr>
<td>M81044/13</td>
<td>MM</td>
<td>Silver, HSCA</td>
<td>Extruded XL-PVDF</td>
<td>150°C</td>
<td>600 V</td>
<td>30 to 20</td>
</tr>
</tbody>
</table>
The ANSI/NEMA WC27500 REV A specification is commonly used to describe both shielded and unshielded cable constructions for avionics, aerospace and airframe applications. The specification allows the user a wide variety of construction choices. Circuit identification, conductor size, insulation type, number of conductors, shielding material and jacket compound may all be specified.

QPL is required for WC 27500 in addition to the basic component wires. The producer of the finished cable must be a qualified source under the applicable basic wire specification or must provide evidence that Qualified wire was used in the construction of the cable.

The colour identification charts below should be used in conjunction with the part M27500 numbering guide illustrated over the page.

**M27500 Colour Table 3A**

For cables having more than 10 conductors, the wires shall be a white base identified by double colour tracers as illustrated in chart below.

<table>
<thead>
<tr>
<th>Wire 1</th>
<th>Wire 2</th>
<th>Wire 3</th>
<th>Wire 4</th>
<th>Wire 5</th>
<th>Wire 6</th>
<th>Wire 7</th>
<th>Wire 8</th>
<th>Wire 9</th>
<th>Wire 10</th>
<th>Wire 11</th>
<th>Wire 12</th>
<th>Wire 13</th>
<th>Wire 14</th>
<th>Wire 15</th>
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</thead>
<tbody>
<tr>
<td>White</td>
<td>Blue</td>
<td>Orange</td>
<td>Green</td>
<td>Red</td>
<td>Black</td>
<td>Yellow</td>
<td>Violet</td>
<td>Grey</td>
<td>Brown</td>
<td>Blue</td>
<td>Orange</td>
<td>Green</td>
<td>Red</td>
<td>Black</td>
</tr>
</tbody>
</table>

Single stripe on white wire

**M27500 Colour Table 3B**

For cables having 1-4 and 6-10 wires colour designation is based on stripe over white wire. Whilst wire 5 has no stripe. Wires 11 to 15 colour designation indicates insulation colour with a white stripe.

<table>
<thead>
<tr>
<th>Wire 1</th>
<th>Wire 2</th>
<th>Wire 3</th>
<th>Wire 4</th>
<th>Wire 5</th>
<th>Wire 6</th>
<th>Wire 7</th>
<th>Wire 8</th>
<th>Wire 9</th>
<th>Wire 10</th>
<th>Wire 11</th>
<th>Wire 12</th>
<th>Wire 13</th>
<th>Wire 14</th>
<th>Wire 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Blue</td>
<td>Yellow</td>
<td>Green</td>
<td>White</td>
<td>Black</td>
<td>Brown</td>
<td>Orange</td>
<td>Violet</td>
<td>Grey</td>
<td>Red</td>
<td>Blue</td>
<td>Yellow</td>
<td>Red</td>
<td>Black</td>
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</table>

Stripe over white wire

**M27500 Colour Table 3C - Wire Sizes Identification**

Cables colour code identification by AWG size. In accordance with MIL-STD686. For MIL-DTL-81381 basic wire, the insulation colour may be opaque dark yellow or unpigmented polyimide resin colour.

<table>
<thead>
<tr>
<th>26</th>
<th>24</th>
<th>24</th>
<th>20</th>
<th>18</th>
<th>16</th>
<th>14</th>
<th>12</th>
<th>10</th>
<th>8</th>
<th>6</th>
<th>4</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>00</th>
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</thead>
<tbody>
<tr>
<td>Black</td>
<td>Blue</td>
<td>Green</td>
<td>Red</td>
<td>White</td>
<td>Blue</td>
<td>Green</td>
<td>Yellow</td>
<td>Brown</td>
<td>Red</td>
<td>Blue</td>
<td>Yellow</td>
<td>Red</td>
<td>White</td>
<td>Blue</td>
<td>Green</td>
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</tbody>
</table>

www.is-rayfast.com
Wire and Cable

NEMA WC27500 • M27500
Airframe and Equipment Wire
Military and Commercial Aerospace

M27500 is low voltage, high temperature cable ideal for use in a variety of both military and commercial applications, including those involving airframes, avionics and ground support equipment.

(Note: This specification was formerly listed under MIL-C-27500 and MIL-DTL-27500.
for more information on the different types of M27500 cable offered please contact us.

Part number example...

<table>
<thead>
<tr>
<th>Specification Number</th>
<th>Colour Code Designator</th>
<th>Gauge of Basic Wire (#22)</th>
<th>Basic Wire Spec &amp; Symbol</th>
<th>Number of Wires in Cable (Two)</th>
<th>Jacket Style</th>
<th>Temp. Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>M27500 - 22 SD 2 T 23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 00 00                | No jacket               |                           |                         |                               |              |
| 01 51                | Extruded white PVC      |                           |                         |                               |              |
| 02 52                | Extruded clear polyamide in accordance with ASTM D4066 |                           |                         |                               |              |
| 03 53                | White polyamide braid with clear polyamide finisher over a polyester tape |                           |                         |                               |              |
| 04 54                | Polyester braid impregnated with high temp finishers over polyester tape |                           |                         |                               |              |
| 05 55                | Extruded Clear FEP      |                           |                         |                               |              |
| 06 56                | Extruded or taped and heat sealed white PTFE |                           |                         |                               |              |
| 07 57                | White PTFE glass braid impregnated & coated with PTFE finisher over pre-sintered PTFE tape |                           |                         |                               |              |
| 08 58                | Crosslinked white Extruded polyvinylidene fluoride (PVDF) |                           |                         |                               |              |
| 09 59                | Extruded white FEP      |                           |                         |                               |              |
| 10 60                | Extruded Clear PVF      |                           |                         |                               |              |
| 11 61                | Tape of natural polyamide with FEP wrapped and heat sealed with FEP outer surface |                           |                         |                               |              |
| 12 62                | Tape of natural polyamide with FEP wrapped and heat sealed with Polyamide outer surface |                           |                         |                               |              |
| 14 64                | Extruded white ETFE (Tefzel) |                           |                         |                               |              |
| 15 65                | Extruded clear ETFE (Tefzel) |                           |                         |                               |              |
| 16 66                | Braid of aromatic polyamide with high-temp finisher over presintered PTFE Tape |                           |                         |                               |              |
| 17 67                | Extruded white ECTFE    |                           |                         |                               |              |
| 18 68                | Extruded clear ECTFE    |                           |                         |                               |              |
| 20 70                | Extruded white perfluoroalkoxy (PFA) |                           |                         |                               |              |
| 21 71                | Extruded clear perfluoroalkoxy (PFA) |                           |                         |                               |              |
| 22 72                | Polymide tape with clear FEP wrapped and heat sealed with opaque polymide outer surface |                           |                         |                               |              |
| 23 73                | White crosslinked extruded modified XLETFE |                           |                         |                               |              |
| 24 74                | White PTFE tape wrapped over tape layer of natural polymide combined with FEP & heat sealed |                           |                         |                               |              |
### Component Wire ID Method

<table>
<thead>
<tr>
<th>Symbol</th>
<th>x2 Shield</th>
<th>Shield Style</th>
<th>Max Temp.</th>
<th>Specification</th>
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<tbody>
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<td>U</td>
<td>-</td>
<td>No Shield</td>
<td>-</td>
<td>CA: MIL-W-22759/13</td>
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<tr>
<td>T</td>
<td>V</td>
<td>Tin Plated Copper, Round</td>
<td>150°C</td>
<td>CB: MIL-W-22759/14</td>
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<tr>
<td>S</td>
<td>W</td>
<td>Silver Plated Copper, Round</td>
<td>200°C</td>
<td>CC: MIL-W-22759/15</td>
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<tr>
<td>N</td>
<td>Y</td>
<td>Nickel Copper, Round</td>
<td>260°C</td>
<td>E: MIL-W-22759/2</td>
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<td>F</td>
<td>Z</td>
<td>Stainless Steel, Round</td>
<td>400°C</td>
<td>EA: MIL-W-22759/1</td>
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<td>C</td>
<td>R</td>
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<td>400°C</td>
<td>JB: MIL-W-22759/28</td>
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<tr>
<td>M</td>
<td>K</td>
<td>Silver Plated HSCA, Round</td>
<td>200°C</td>
<td>JC: MIL-W-22759/29</td>
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<td>P</td>
<td>L</td>
<td>Nickel Plated HSCA, Round</td>
<td>260°C</td>
<td>JD: MIL-W-22759/30</td>
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<tr>
<td>G</td>
<td>A</td>
<td>Silver Plated Copper, Flat</td>
<td>200°C</td>
<td>JE: MIL-W-22759/31</td>
</tr>
<tr>
<td>H</td>
<td>B</td>
<td>Silver Plated HSCA, Flat</td>
<td>200°C</td>
<td>LE: MIL-W-22759/9</td>
</tr>
<tr>
<td>J</td>
<td>D</td>
<td>Tin Plated Copper, Flat</td>
<td>150°C</td>
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</tr>
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<td>X</td>
<td>Nickel Plated HSCA, Flat</td>
<td>260°C</td>
<td>ME: MIL-W-81044/6</td>
</tr>
<tr>
<td>I</td>
<td>Q</td>
<td>Nickel Chromium Alloy, Flat</td>
<td>400°C</td>
<td>MF: MIL-W-81044/7</td>
</tr>
</tbody>
</table>

### Notes and Comments

1. PVC materials shall not be used for aerospace
2. Not for Naval Air Systems Command usage
3. Inactive for new design
EN2266 - Hook up airframe wiring, Polyimide tapes and FEP topcoat, with temperature rating -55ºC to +200ºC.

EN2267 - Hook up airframe wiring, polyimide plus PTFE tapes, with temperature rating -65ºC to +260ºC

EN2713 - Hook up airframe wiring, shielded and jacketed wire, with Polyimide & FEP sheath with temperature rating -65ºC to +200ºC

EN2714 - Hook up airframe wiring, shielded and jacketed wire, with Polyimide & PTFE tapes with temperature rating -65ºC to +260ºC

ABS - 0949, 1354 and 1356

NSA - NSA 935344 and NSA 935348

European Standards (ENs) are governed by three European Standardization Organisations (ESOs): CEN, CENELEC or ETSI. Such standards are recognised as a collaborative effort in technical standardisation per EU Regulation 1025/2012.

For supply chain experience, IS-Group has strategic Mil/Aero franchises with existing international status suppliers. Plus the ability to help design, engineer and supply industry leading products.

IS-Group supplies a variety of EN-compliant hook-up wires for high temperature aerospace applications that are available in single and multi-core designs.

Different polyimide/PTFE insulation and jacketing provide excellent resistance to aircraft fluids, chemicals and more. These cables are UV markable and they also have low smoke density and toxicity.

If the specification required is not listed on these pages please contact us as we supply an extensive range of specialist wire and cable.
### EN2266 Hook-up and Airframe Wiring, -55°C to +200°C

<table>
<thead>
<tr>
<th>Reference</th>
<th>Family</th>
<th>Construction</th>
<th>AWG</th>
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<tbody>
<tr>
<td>EN2266-005A</td>
<td>CF-U</td>
<td>Nickel plated copper. Insulation Polyimide tapes and FEP topcoat</td>
<td>26 to 10</td>
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<td>EN2266-003B</td>
<td>PF</td>
<td>Cores: 2 x EN2266 basic cores twisted cable</td>
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<tr>
<td>EN2266-003C</td>
<td>QF</td>
<td>Cores: 3 x EN2266 basic cores twisted cable</td>
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<tr>
<td>EN2266-003D</td>
<td>RF</td>
<td>Cores: 4 x EN2266 basic cores twisted cable</td>
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</tr>
<tr>
<td>EN2266-008B</td>
<td>DRP</td>
<td>Cores: 2 x EN2267-009A (DRA) basic cores twisted cable</td>
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<tr>
<td>EN2266-008C</td>
<td>DRT</td>
<td>Cores: 3 x EN2267-009A (DRA) basic cores twisted cable</td>
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<tr>
<td>EN2266-008D</td>
<td>DRQ</td>
<td>Cores: 4 x EN2267-009A (DRA) basic cores twisted cable</td>
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### EN2267 Hook-up and Airframe Wiring, -65°C to +260°C

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<td>Nickel plated copper. Insulation Polyimide + PTFE tapes</td>
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<td>EN2267-007A</td>
<td>DMA</td>
<td>Nickel plated copper. Insulation Polyimide + PTFE tapes, UV proof</td>
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<td>EN2267-007B</td>
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<td>Cores: 4 x EN2267-007 (DMA) basic cores twisted cable</td>
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<td>EN2267-010A</td>
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<td>Nickel plated copper. Insulation Polyimide + PTFE tapes</td>
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<td>Same construction as DR but not sensitive to UV</td>
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<td>EN2267-011</td>
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<td>Cores: 2 x EN2267-012 (DZ) basic cores twisted cable</td>
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## EN2713 Hook-up and Airframe Wiring, -55°C to +200°C

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<td>TK-U</td>
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<tr>
<td>EN2713-007C</td>
<td>UD-U</td>
<td>3 x EN2266 basic core, plus shield and sheath</td>
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<td>EN2713-003D</td>
<td>VL</td>
<td>4 x EN2266 basic core, plus shield and sheath</td>
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### 115V AC Shielded & Jacketed - Spiral screen silver plated copper and Polyimide tapes plus FEP top coat

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<td>EN2713-011A</td>
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<td>EN2713-011D</td>
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<td>Cores: 4 x EN0261-CFA (DRA) basic cores twisted cable</td>
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### 115V AC Shielded & Jacketed - Silver plated copper spiral shield and Polyimide & Fluoropolymer top coat

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<td>MNC</td>
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<tr>
<td>EN2713-012D</td>
<td>MND</td>
<td>Cores: 4 x EN2267-009A (DRA) basic cores twisted cable</td>
<td>26 to 16</td>
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## EN2714 Hook-up and Airframe Wiring, -65°C to +260°C

### 115V AC Shielded & Jacketed - Nickel plated copper spiral shield and Polyimide & PTFE tapes

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<td>EN2714-011B</td>
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<td>Cores: 2 x EN2267-007 (DMA) basic cores twisted cable</td>
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<td>EN2714-011C</td>
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<td>Cores: 3 x EN2267-007 (DMA) basic cores twisted cable</td>
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<td>EN2714-011D</td>
<td>VV</td>
<td>Cores: 4 x EN2267-007 (DMA) basic cores twisted cable</td>
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<td>EN2714-012E</td>
<td>MJ</td>
<td>Cores: 5 x EN2267-007 (DMA) basic cores twisted cable</td>
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### 115V AC Shielded & Jacketed - Nickel plated copper braided shield and Polyimide & PTFE tapes

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<tr>
<td>EN2714-013B</td>
<td>MLB</td>
<td>Cores: 2 x EN2267-009A (DRA) basic cores twisted cable</td>
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<tr>
<td>EN2714-013C</td>
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<td>EN2714-013D</td>
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<td>EN2714-014E</td>
<td>MME</td>
<td>Cores: 5 x EN2267-009A (DRA) basic cores twisted cable</td>
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<td>EN2714-014X</td>
<td>MMX</td>
<td>Cores: 6 to 10 available on request</td>
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### ABS Airframe Wiring Lightweight, -55°C to +180°C

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<td>ABS 0949</td>
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<td>Nickel plated copper clad aluminium (24-4), Nickel plated alu’</td>
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<td>ABS 1354</td>
<td>ADA</td>
<td>Same construction as AD but not sensitive to UV</td>
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<tr>
<th>115V AC Multi-Cores</th>
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<tbody>
<tr>
<td>ABS 1354</td>
<td>ADB</td>
<td>Cores: 2 x ABS 1354 (ADA) basic cores twisted cable</td>
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<tr>
<td>ABS 1354</td>
<td>ADC</td>
<td>Cores: 3 x ABS 1354 (ADA) basic cores twisted cable</td>
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<tr>
<td>ABS 1354</td>
<td>ADD</td>
<td>Cores: 4 x ABS 1354 (ADA) basic cores twisted cable</td>
<td>24 to 000</td>
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</table>

<table>
<thead>
<tr>
<th>115V AC Shielded &amp; Jacketed - Nickel plated copper spiral shield, with Polyimide + PTFE tapes</th>
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<tbody>
<tr>
<td>ABS 1356</td>
<td>VNA</td>
<td>Cores: 1 x ABS 1354 (ADA) basic core</td>
<td>24 to 10</td>
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<tr>
<td>ABS 1356</td>
<td>VNB</td>
<td>Cores: 2 x ABS 1354 (ADA) basic cores twisted cable</td>
<td>24 to 10</td>
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<tr>
<td>ABS 1356</td>
<td>VNC</td>
<td>Cores: 3 x ABS 1354 (ADA) basic cores twisted cable</td>
<td>24 to 10</td>
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<tr>
<td>ABS 1356</td>
<td>VND</td>
<td>Cores: 4 x ABS 1354 (ADA) basic cores twisted cable</td>
<td>24 to 14</td>
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### NSA Data Transmission Coaxial, -68°C to +250°C

<table>
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<td>Coaxial Cables</td>
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<tr>
<td>NSA 935344</td>
<td>XE</td>
<td>Si plated Cu covered steel, dielectric PTFE, shield Si plated Cu braid, PTFE jacket</td>
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<tr>
<td>NSA 935348</td>
<td>XK</td>
<td>Si plated Cu covered steel, dielectric PTFE, shield Si plated Cu braid, FEP jacket</td>
<td>75</td>
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</table>
Boeing Specification Wire (BMS 13) products are some of the most reliable and trusted wires and cables available for the aerospace and military industries. All of our Boeing Specification Wire products are designed and tested to meet Boeing specifications for use in most areas of construction. Whether you are transmitting power, data, or signals, IS-Group has a Boeing Specification wire to meet your needs.

We offer all types of BMS13 cable available in various configurations and made from the highest quality materials. You can choose conductors made from high strength copper alloy, silver coated, nickel coated, tin-plated and more.

BMS13 cables can operate in temperatures from -65°C to +310°C, data bus from 50-120 ohms and can carry up to 600 volts. You should choose a design of cable based on the needs and conditions of your specific application.

Some conditions to consider should include:
- Primary function of the cable (fibre optic, databus, general use, etc.)
- Movement, chafing and vibration
- Insulation material, thickness and weight (heavyweight or lightweight)
- Pressurised or unpressurised environments
- Corrosion, fire and temperature resistance
- Resistance to fluids and chemicals
- Conductor or shield coating material

Part number example...

**BMS13-XX TXX CXX GXXXX**

We have only illustrated the two most popular wire and cable charts, being BMS 13-48 & BMS 13-60. Please contact us for the availability other versions.
<table>
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<th>Type</th>
<th>Class</th>
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<th>Shield</th>
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## BMS 13-60 Arc Resistant, 600V Wire and Cable, -65°C up to +260°C

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Pi - Polyimide
### Boeing 13-60 Spec Wire
#### Boeing Military and Commercial Aerospace

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ZHPCG Cable
Zero Halogen Power Cable

Type ZHPCG-15/-35
Halogen free cable with good oil resistance and resistance to water. It is particularly suitable to the Mass Transit, Marine and Off-Shore industries where its low fire hazard performance and flexibility are key to a successful installation.

For further details and information regarding non-standard colours please contact us.

CK0226 Rail Cable
EN45545-2 rail approved Zero Halogen Power Cables, available as 750V/1300V or 1800V/3300 rated.
Halogen free cable with good oil resistance and resistance to water, making them ideal for the Rail Market, where its low fire hazard performance and flexibility are key to a successful installation.

Product Features
- Zero halogen
- Small size and lightweight
- Excellent handling and flexibility
- Outstanding resistance to oils, plus scrape abrasion and cut through.
- Voltage rating: 750V/1300V or 1800V/3300
- Conductor cores 1.0mm² to 400mm².
- Temperature rating: -25ºC up to +105ºC.
- Dual wall construction

Approvals & Declarations
EN 45545-2
DIN 5510-2

Voltage Rating
- ZHPCG-15  750/1300V
  IEC Class 5 - Flexible cable
- ZHPCG-35  1800/3300V
  IEC Class 5 - Flexible cable
- ZHPCG-36  1800/3300V
  IEC Class 6 - Very flexible cable

Colours
- Standard jacket colour black
- Colours on request

For further details and information regarding rail approved CK0226 cable non-standard colours please contact us.
### Fire Hazard Performance

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Part number example...

**ZHPCG - 35 - 16.0 - 0 CK0226**

**Part Numbering example**

- Denotes Rail if required
- **Jacket Colour**
  - 0 = Black, standard colour
- **Conductor Size**
  - 1.0mm² to 400mm²
- **Conductor Type**
  - 5 = IEC Class 5 flexible
  - 6 = IEC Class 6 very flexible
- **Voltage rating**
  - 1 = 750/1300 V
  - 3 = 1800/3300 V
- **Product Family**
  - ZHPCG 15, 35 or 36
Range of flexible power cables insulated and jacketed using materials that provide improved performance over other materials available, such as CSP/EPR, silicone, or PCP/Butyl.

**Features & Benefits**

- Size and weight savings
- Excellent flexibility
- Resistance to solvents and chemicals
- Corona resistance
- Arc-resistance of materials

**Type TR16**

General purpose, single-wall, 125°C construction normally specified for use inside cabinets in protected areas. Conductor sizes 2.5mm² to 95mm²

**Type ZHI15**

Halogen-free cable with good oil resistance, particularly suitable for use in offshore, ship and mass transit applications where low-fire-hazard performance is required. Conforms to Defence Standard 61-12 part 31 specification. Conductor sizes 1.5mm² to 400mm²

**Type AFR35**

A single-extrusion, abrasion resistant, flame and fuel-resistant, radiation cross-linked polyolefin cable. Conductor sizes 1.5mm² to 400mm²

**Type FTR16**

Dual-wall diesel-oil resistant cable originally developed for tank engine compartment applications. Meets the German BWB VG 95218 specification. Conductor sizes 4mm² to 120mm²

For further details and information regarding non-standard colours please contact us.

### Part number example...

**TR 16 - 16 - 0**

- Standard Colour
  - 0 = Black
  - 8 = Grey
  - 9 = White
- Conductor Size
  - 1.5mm² to 185mm²
- Conductor Type
  - 5 = IEC Class 5
  - 6 = IEC Class 6
- Voltage rating
  - 1 = 600/1000 V
  - 3 = 1900/3300 V
- Type
  - TR, ZHI, AFR, FTR, ZHPCG

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</table>
SHF-260 is a highly flexible premium performance power cable, for applications requiring up to 1000 volts (rms).

The need for a combination of high temperature and high performance in wire insulation has become a critical factor in today’s platforms. This is especially true in large diameter power feeder applications where temperature and durability are key.

The highly flexible nature of SHF-260 allows the cable to be bent and routed in extremely tight areas with no wrinkling or cracking of the insulation. This results in being able to run shorter distances, reducing the stress on the contact and reducing the mating and demating forces normally associated with large shell diameter circular connectors, such as MIL-C-5015 and MIL-C-83723 connectors.

Its ability to route in tight spaces may allow the user to go “up” in AWG sizes and eliminate the need to split power, where routing and bending previously prevented the user from doing so.

Applications
Typical uses include both primary and secondary power distribution applications where high amperage is needed.

Features & Benefits
- Handles down to a 6x bend radius
- All extruded fluoropolymer based insulation system
- Outstanding chemical and fluid resistance when tested to SAE-AS-22759/41
- Corona resistant when tested to ASTM D1868
- Arc resistant to the SAE-AS-22759
- Available in sizes from 0000 to 24 AWG
- Meets FAR Part 25 flammability

Operating Temperature
- -65°C to +260°C

Voltage Rating
- 1000 volts (rms)
COAXIAL Cables

Cheminax

Introduction

Cheminax controlled electrical cables are used in the aircraft and aerospace industries. They have a wide range of applications in missiles, avionics, radio frequency and microwave systems, computers, security & surveillance systems and communications.

Cheminax coaxial cables were designed to solve interconnect problems in electronic systems, such as computers, military equipment and other areas of high-density packing, where cables are required to perform to more exacting specifications than standard radio grade (RG) or UL recognised (UR) constructions.

Cheminax coaxial cables offer a smaller and lighter solution than both standard RG and UR cables.

Features & Benefits

- Small size, light weight
- Low capacitance and attenuation
- High velocity of propagation
- High flexibility

Operating Temperature

Available with an operating temperature from -65ºC up to +200ºC. Temperature rating varies depending on materials used in specific construction.

Other Cheminax coaxial cable material options are available, for additional information please refer to the following pages for part number configuration.

Thermorad - Is a general purpose jacket material which is unaffected by most common chemicals and solvents and is suitable for use during NBC decontamination, with a typical operating temperature between -55ºC to 125ºC depending on dielectric material. Thermorad is highly flame retardant and has an overall balance of physical and chemical properties.

CCS - copper clad steel
HSCA - high strength copper alloy

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Impedance (Ohms)</th>
<th>Capacitance (pF/m)</th>
<th>Attenuation (dB/100m)</th>
<th>Conductor (mm)</th>
<th>Nom. Dielectric Dia. (mm)</th>
<th>Nom. Cable Dia. (mm)</th>
<th>Nom. Weight (kg/100m)</th>
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Part Numbering example

JACKET COLOUR
0  Black
1  Brown
2  Red
3  Orange
4  Yellow
5  Green
6  Blue
7  Violet
8  Grey
9  White
9X  Translucent white
X  Clear

CONDUCTOR TYPE
1  Tin plated copper
2  Silver plated copper
3  Nickel plated copper
4  Silver plated HSCA
5  Aluminium
6  Nickel coated HSCA
7  Tin plated CCS
8  Silver plated CCS
9  Bare copper
A  Silver coated CS95
0  Other

DIELECTRIC MATERIAL
1  Rayfoam L
2  Rayfoam H
3  Rayolin F
4  Modified FEP
5  Aluminium
6  Modified XL-ETFE
7  Flex XL-ETFE
8  Rayfoam M
9  None
0  Other

OUTER JACKET MATERIAL
1  General purpose PVF2
2  Outer space PVF2
3  Thermod F & S
4  Modified FEP
5  ETFE (Un-crosslinked)
6  Modified XL-ETFE
7  Flex XL-ETFE
8  Zerohal & Thermodrad
9  None
0  Other

CONSTRUCTION
1  Round braid
2  Flat braid
3  Two round braids
4  Two shields (other)
5  Triax round braids
6  Triax other
7  Other
8  Composite shield
9  Core only
0  Other

VARIATION
A  Standard
B  Sequential PNs
S  Outer space
U  Low loss
W  Water blocked

CONDUCTOR SIZE (AWG)
Always 2 digits - 0X if under 10 AWG

IMPEDEANCE
Always 2 digits - last 2 digits if over 100 ohms
0X (1 digit) if under 10 ohms
COAXIAL Cables
Cheminax
Alternatives to RG cables

Alternative Solutions
The comprehensive lists below is provided as a quick guide for high performance upgrades to standard RG & UR cables, with a brief comment on benefits and key features. To complement the mechanical and electrical features of Cheminax miniature coaxial cables please refer to the electrical interconnect section of this catalogue.

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Alternative Solutions
The comprehensive lists below is provided as a quick guide for high performance upgrades to standard RG & UR cables, with a brief comment on benefits and key features. To complement the mechanical and electrical features of Cheminax miniature coaxial cables please refer to the electrical interconnect section of this catalogue.

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Note: To complement the mechanical and electrical features of Cheminax miniature coaxial cables please refer to the electrical interconnect section of this catalogue.
RF COAXIAL Cables
50 Ohm Cables
Overview RFMATES®

RF - 50 Ohm coaxial and triaxial cables designed and manufactured to meet the most stringent electrical and mechanical performance criteria. Ideal for advanced electronic applications including lightweight, low loss, high flexibility, high EMI immunity, high temperature and high corrosive resistance. All RF cables are Skydrol resistant.

Meets Requirements of
FAR Part 23 and 25, Appendix F
Mil-C-17 (as applicable)

More flexible | Tighter bend radius | Smaller outside diameter | Lower attenuation

Offers up to +200°C operating temperature, subject to cable specification.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Conductor</th>
<th>Loss @ 1.0 GHz</th>
<th>Min. Bend Radius</th>
<th>Diam. mm</th>
<th>Weight /100m</th>
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<td>14awg stranded SPC</td>
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<td>S65161</td>
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<td>S44191</td>
<td>20awg stranded SPC</td>
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<td>-80 dB</td>
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Triax Cable

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<tr>
<td>L2201TX</td>
<td>20awg stranded SPC</td>
<td>66.9 dB/100m</td>
<td>31.75 mm</td>
<td>6.22</td>
<td>8.9 Kg</td>
<td>-75 dB</td>
</tr>
</tbody>
</table>

Cable comparison between standard RG cable and RF-Mates performance cable.

Standard RG393
Performance PIC UH67193

sales@is-rayfast.com | +44(0)1793 616700
VIDEO COAXIAL Cables
75 Ohm Cables Overview VideoMATE®

VIDEO - 75 Ohm and Triaxial Cables
Our 75 ohm coaxial and triaxial video cables are lightweight, low loss, flexible and easy to terminate. They are specifically designed and manufactured for reliable performance in aircraft systems and other harsh environments involving high temperature, strong EMI and/or corrosive materials. All 75 ohm video cables are Skydrol resistant.

Meets Requirements of FAR Part 23 and 25, Appendix F Mil-C-17 (as applicable)

More flexible  |  Tighter bend radius  |  Smaller outside diameter  |  Lower attenuation

Offers up to +200°C operating temperature, subject to cable specification.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Conductor</th>
<th>Application Notes</th>
<th>Loss (dB/100m)</th>
<th>Diam. mm</th>
<th>Weight /100m</th>
<th>Shielding</th>
</tr>
</thead>
<tbody>
<tr>
<td>V75268</td>
<td>26awg Stranded SPC</td>
<td>RS170 Video RG179 Replacement</td>
<td>16.4 @ 100 MHz</td>
<td>3.10</td>
<td>1.9 kg</td>
<td>-50 dB</td>
</tr>
<tr>
<td>V76261</td>
<td>26awg Stranded SPC</td>
<td>RS170 Video RG179 Replacement</td>
<td>16.4 @ 100 MHz</td>
<td>3.10</td>
<td>1.7 kg</td>
<td>-90 dB</td>
</tr>
<tr>
<td>V73263</td>
<td>26awg Stranded SPC</td>
<td>SMPTE 292M Video</td>
<td>66.6 @ 1.45 GHz</td>
<td>3.18</td>
<td>2.2 kg</td>
<td>-110 dB</td>
</tr>
<tr>
<td>V78209</td>
<td>20awg Stranded SPC</td>
<td>SMPTE 424M Video</td>
<td>62.3 @ 3.0 GHz</td>
<td>5.36</td>
<td>4.7 kg</td>
<td>-90 dB</td>
</tr>
</tbody>
</table>

Triaxial Cable

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Conductor</th>
<th>Application Notes</th>
<th>Loss (dB/100m)</th>
<th>Diam. mm</th>
<th>Weight /100m</th>
<th>Shielding</th>
</tr>
</thead>
<tbody>
<tr>
<td>L7626TX</td>
<td>26awg Stranded SPC</td>
<td>RS170 Video</td>
<td>18.0 @ 100 MHz</td>
<td>3.99</td>
<td>3.3 kg</td>
<td>-90</td>
</tr>
</tbody>
</table>

CONNECTOR SOLUTIONS
Also available

The Best Made Solution
PIC V75268
PIC V78209
PIC L7626TX

www.is-rayfast.com
High quality, high performance engineered electronic high speed data cables and interconnect solutions for demanding military, aerospace and motorsport applications. These products are designed and manufactured to meet stringent electrical and mechanical performance criteria including EMI immunity, lightweight, low loss, high temperature and harsh environment.

Meets Requirements of
FAR Part 23 and 25, Appendix F

The part reference table below represents a brief overview of the range only, for additional information or details of Cat 7 cables please contact us.

## High Speed Data Cables - characteristics and properties overview

<table>
<thead>
<tr>
<th>Cable Family</th>
<th>Capability</th>
<th>Part No.</th>
<th>Rating</th>
<th>Data Pairs</th>
<th>Conductors</th>
<th>Dia. mm</th>
<th>Weight /100m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DataMATES® PLUS</strong></td>
<td>-55°C to +200°C</td>
<td>E10224</td>
<td>Cat 5e</td>
<td>1 pair</td>
<td>24awg stranded SPC</td>
<td>4.14</td>
<td>3.2kg</td>
</tr>
<tr>
<td></td>
<td>&gt;76m distance</td>
<td>E40424</td>
<td></td>
<td>2 pairs</td>
<td></td>
<td>5.28</td>
<td>4.1kg</td>
</tr>
<tr>
<td></td>
<td>Better shielding</td>
<td>E50824</td>
<td>Cat 6</td>
<td>4 pairs</td>
<td></td>
<td>6.73</td>
<td>7.4kg</td>
</tr>
<tr>
<td></td>
<td>Better corrosion</td>
<td>E6A0824</td>
<td>Cat 6, 6a</td>
<td>4 pairs</td>
<td></td>
<td>6.99</td>
<td>7.9kg</td>
</tr>
<tr>
<td><strong>DataMATES® BASE</strong></td>
<td>150°C temp.</td>
<td>E12224</td>
<td>Cat 5e</td>
<td>1 pair</td>
<td>24awg stranded TPC</td>
<td>3.71</td>
<td>2.4kg</td>
</tr>
<tr>
<td></td>
<td>&gt;61m distance</td>
<td>E12424</td>
<td></td>
<td>2 pairs</td>
<td></td>
<td>5.28</td>
<td>3.4kg</td>
</tr>
<tr>
<td></td>
<td>Laser markable</td>
<td>E6A2824</td>
<td>Cat 6, 6a</td>
<td>4 pairs</td>
<td></td>
<td>6.99</td>
<td>6.8kg</td>
</tr>
<tr>
<td><strong>DataMATES® LITE</strong></td>
<td>200°C temp.</td>
<td>E13226</td>
<td>Cat 5e</td>
<td>1 pair</td>
<td>26awg stranded SPCA</td>
<td>3.40</td>
<td>2.5kg</td>
</tr>
<tr>
<td></td>
<td>&gt;54m distance</td>
<td>E13426</td>
<td></td>
<td>2 pairs</td>
<td></td>
<td>3.99</td>
<td>2.9kg</td>
</tr>
<tr>
<td></td>
<td>Very light</td>
<td>E6A3824</td>
<td>Cat 6, 6a</td>
<td>4 pairs</td>
<td>24awg SPC</td>
<td>6.60</td>
<td>7.1kg</td>
</tr>
<tr>
<td></td>
<td>Very flexible</td>
<td>E6A3826</td>
<td></td>
<td>4 pairs</td>
<td>26awg SPC</td>
<td>5.59</td>
<td>5.2kg</td>
</tr>
<tr>
<td><strong>QUADRAX</strong></td>
<td></td>
<td>E51424</td>
<td>Quadra</td>
<td>4 Core</td>
<td>24awg SPCA</td>
<td>4.06</td>
<td>3.3kg</td>
</tr>
<tr>
<td></td>
<td>10% lighter</td>
<td>E51426</td>
<td></td>
<td></td>
<td>26awg SPCA</td>
<td>3.48</td>
<td>2.7kg</td>
</tr>
<tr>
<td></td>
<td>Lower Loss</td>
<td>E50424</td>
<td></td>
<td></td>
<td>24awg SPC</td>
<td>4.32</td>
<td>4.0kg</td>
</tr>
<tr>
<td><strong>USB 2.0</strong></td>
<td></td>
<td>USB2422</td>
<td>Data pair impedance 90Ω</td>
<td>2 data pairs</td>
<td>24-22awg</td>
<td>4.57</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>up to 200°C temp</td>
<td>USB2624</td>
<td></td>
<td></td>
<td>26-24awg</td>
<td>4.17</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>EIA-364; USB 2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skydrol resistant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RoHS compliant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LFH Low Fire Hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FAR pt 23 &amp; 25 (F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MICRO - X and Ku Band Cable Assemblies

Provides high bandwidth for data and support satellite communications. These High Frequency cables are rated to a minimum 200°C on all materials and offer reduced weight, decreased loss and improved EMI performance.

Designed specifically to serve Ku Band & X Band applications, these cables feature: Inner flat or strip braid; High temperature polyamide foil; Dual braided shields and Silver plated copper throughout.

Correct cable assembly is critical to realising the full benefits of the cable and connector technology. Our service ensures the best performance solution.

### Electromagnetic Spectrum

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Max. Freq.</th>
<th>VOP %</th>
<th>Diam. mm</th>
<th>Weight /100m</th>
<th>Shielding</th>
<th>Loss @ 1GHz /100m</th>
<th>Loss @ 12GHz /100m</th>
<th>Loss @ 18GHz /100m</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT77300F</td>
<td>18 GHz</td>
<td>77.0%</td>
<td>7.62</td>
<td>13.1 kg</td>
<td>-90 dB</td>
<td>16.4 dB</td>
<td>64.0 dB</td>
<td>81.0 dB</td>
</tr>
<tr>
<td>HT77210F</td>
<td>26 GHz</td>
<td>76.5%</td>
<td>5.28</td>
<td>4.5 kg</td>
<td>-90 dB</td>
<td>24.9 dB</td>
<td>96.8 dB</td>
<td>122.4 dB</td>
</tr>
<tr>
<td>HH85295F</td>
<td>18 GHz</td>
<td>84.0%</td>
<td>7.49</td>
<td>12.8 kg</td>
<td>-110 dB</td>
<td>13.8 dB</td>
<td>49.9 dB</td>
<td>62.3 dB</td>
</tr>
<tr>
<td>HH85210F</td>
<td>26 GHz</td>
<td>85.0%</td>
<td>5.33</td>
<td>6.5 kg</td>
<td>-90 dB</td>
<td>21.6 dB</td>
<td>83.8 dB</td>
<td>105.0 dB</td>
</tr>
</tbody>
</table>

- Certified Test Process & Equipment
- Phase-matched Ship Sets
- Qualified Assembly Experts
- ISO 9001; AS 9100 Certification
- Complete traceability
- Improved Supply Chain Efficiency

www.is-rayfast.com
IS-Group offer a comprehensive portfolio of high performance cables designed for today’s modern range of warships and submarines.

**Zerohal Marine Cables**

The cables briefly described over these two pages are manufactured and approved to UK Defence Standard 61-12 (Part 25) and have been widely adopted as the basis for lightweight Limited Fire Hazard (LFH) cables by the UK Navy and many other Navies worldwide. Limited Fire Hazard Cables are designed to minimise the risk associated with the generation of smoke and toxic fumes during a fire.

**Def Stan 61-12 (Part 25) Spec Summary**

Cables manufactured and approved to Def Stan 61-12 (part 25) use component wires and cable jackets approved to specifications which independently impose performance limits on the generation of smoke and fumes in fire.

Def Stan 61-12 (Part 25) cables employ;

- Component wires approved to Def Stan 61-12 (Part 18). Within this specification, wires are categorised as Type 1 pliable, or Type 2 non-pliable. Component wires 99M0111 are Type 1, pliable wires.
- Jacket material is approved to Def Stan 61-12 (Part 31) (Limited Fire Hazard Sheathing for Electric Cables). Zerohal jacket material is fully approved to this specification.

Def Stan 61-12 (Part 25) details a number of specific cable constructions. Alternative cable constructions utilising optional component layout or specialised shielding are available on request. Alternative constructions use approved wires and jackets and will meet the full performance requirements of Def Stan 61-12 (Part 25).

**Other LFH Specification Approvals**

- MSV 34411, 34412, 34430, 34435, 34436 (Netherlands)
- Mil-C-24640, PMS 400 (USA)
**Def Stan 61-12 (part 25)**

**Zerohal Marine Cables**

**Limited Fire Hazard**

---

**Multicore Cables (A & B)**

- 2 core - one Red & one Blue.
- 3 core - one Red, one Blue & one White.
- Others - 2 adjacent marker cores - one Red (pilot core), one Blue (direction core), remainder all White in each cable layer.

Where a single core is used in the centre of the cable, its colour shall be White. All cores in a multicore cable having four or more cores, shall be identified by means of numbers in a contrasting colour.

**Multipair Cables, Screened (C)**

- For each layer the First pair has 1 core Black, 1 core Red (pilot pair).
- Second pair has 1 core Black, 1 core Blue (direction pair).
- All other pairs have 1 core Black, 1 core White.

Where one pair is used in the centre, the colours shall be 1 core Black, 1 core White. Where the cable consists of one pair only, the colours shall be 1 core Red, 1 core Blue and not numbered. All pairs shall also be identified by means of numbers in a contrasting colour, starting from black numbered 1 of the first pair.

**Multipair Cables, Screened (D & E)**

Each pair shall have one core Red, one core Blue with an overall shield and double mylar wrap. Pairs shall be identified by means of numbering in black ink on outer mylar wrap.

**Multitriple Cables Screened (F)**

In multitriple cables, each triple shall have one core Red, one core Blue, one core White with the White core numbered sequentially in Black.

**Mains Colour Cables**

- 2 core - 1 Blue & 1 Brown
- 3 core - 1 Blue, 1 Brown & 1 Yellow/Green

**Cable Sheath Marking**

Each cable sheath shall be marked with the relevant NATO Stock Number, the component wire conductor stranding, year of manufacture and manufacturer’s name in accordance with Def Stan 61-12 (Part 25).
SPECIALIST Cables
Electrical cables and composite systems

Introduction

Used in a wide variety of demanding industrial and commercial applications, including factory automation and robotics, materials handling, processing, packaging and building services.

As a distributor we ensure the end product is of the highest order. All of the specialist cables we supply have been tested by the manufacturer to meet stringent quality and durability requirements. Such testing ensures reliability on site, making for cost effective installation.

The more complex the application, the more bespoke cables have to be produced. We select manufacturers with many years of experience of materials such as PVC, PUR, Rubber, Silicone, TPE and Low smoke halogen-free compounds, from basic multi-core cables to composite cables we can help to design a cable to a customer’s exact requirements. Of course, a custom cable does not always have to be highly complex and from printing customer details to a change of outer sheath colour, we are always willing to assist in solving your requirements.
SPECIALIST Cables
Special electric cables and composite cables systems

Nuclear
Complete range of cables for all aspects of nuclear engineering: power, control, coaxial, telecoms, umbilical, or composite. Cables can be individually or overall shielded, armoured and reinforced.

- Flame retardant to IEC 332.1 & 332.3
- Resist radiation doses up to 200 Mrads.
- Cables in accordance to Cogema La Hague and Cogema Melox specification (centre for the enrichment and re-treatment of uranium).
- Cable types 10 Nouvelle Generation.
- Mulrad 2 cables.
- Cables for nuclear robotics.

Robotics
A wide range of special and standard cables designed for your robotic and drag chain applications.

- F3 for short drag chain applications.
- F1X for long distance and fast drag chains
- F1 for continuous bending and torsional applications with high speed acceleration.
- F1 Gold, for extreme conditions
- UL extra flexible cables
- BUS cables / MultiBUS cables
- Umbilicals
- Composites cables

SubSea
Providing both composite electrical and optical cables for many applications such as ROVs, seabed vehicle umbilicals to ship and submarine.

- ROV tethers
- Umbilicals fixed and mobile equipment
- Trenching and burying machines
- Detection and sonar
- Oceanographic and buoy
- Mooring line and stay
- Onboard power and instrumentation
- Floating cables
Custom Cable Designs

Introduction and Overview

Multi-conductor cables provide high performance custom designed solutions for the most demanding applications and environments, including but not limited to Aerospace, Marine and Industrial markets.

Consideration should be given to the selection of components used in the cable, to ensure the right combination of physical, chemical and electrical properties is achieved to meet your specific application requirements.

High-performance component wires and miniature coaxial cables are combined with unique cable jacket materials to meet the requirements of demanding environments. We can provide a rapid response to any design requests, supported by the highest quality manufacturing standards.

Services offered include...

- Prototype cable production
- Full production

Prototyping Service

Cable engineers and buyers can spend valuable time and resource sourcing relatively short lengths of high-performance bespoke multi-core cables. Increasingly however, they are burdened by large minimum order quantities and extended lead times, commonly demanded by today’s cable manufacturers.

The solution is our Prototype Cable Service, the result of investment in plant and machinery combined with the excellent in-house knowledge of our production and design team.

By using our novel combination of machine cabled components insulated with a heat-shrink jacket, we aim to build and deliver your cable within 4 weeks of receiving your order for cable designs made from stocked components.

Full Production Service

Subject to minimum order quantities the possible range of extruded jacket material is extended to include additional highly controlled performance materials.

Please see following pages for an essential overview of possibilities, for more information please contact us.

Customised cable designs
Detailed design specifications & drawings
Machine cabled components
Wide selection of stocked wire components
Machine braided optimised EMI screens
Choice of cross-linked heat-shrink jackets
Low minimum order quantities
Coiled and prepared cables

“Our aim is to manufacture and deliver high quality machine built customised cables within 6 to 8 weeks of receiving an order”
We stock many wire constructions, gauges and colours, all of which are available for forming part of our customised multicore cable design and build service.

The choice of primary wire is the first step to designing a cable and is critical to its final performance.

Listed below are our most popular wires, but we have also provided unique multicore cables that have included the following wires and cable combinations...

- Flexible power
- Ethernet, USB and Quadrax
- Coaxial and Triaxial RF and Video cable
- Optical fibres

For more information please see relevant cable specifications.

### 1a. CONDUCTOR Selection

<table>
<thead>
<tr>
<th>Conductor size (AWG)</th>
<th>No. Strands / Diameter</th>
<th>Conductor OD (mm) nominal</th>
<th>Cross sectional area (mm²)</th>
<th>Resistance (Tinned Cu) Ω/km max @ 20ºC</th>
<th>Current carrying capacity (amps) 30ºC rise above 20ºC ambient</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7/0.10</td>
<td>0.30</td>
<td>0.06</td>
<td>356.0</td>
<td>2.2</td>
</tr>
<tr>
<td>28</td>
<td>7/0.13</td>
<td>0.38</td>
<td>0.09</td>
<td>225.0</td>
<td>2.9</td>
</tr>
<tr>
<td>26</td>
<td>19/0.10</td>
<td>0.50</td>
<td>0.16</td>
<td>135.0</td>
<td>4.1</td>
</tr>
<tr>
<td>24</td>
<td>19/0.13</td>
<td>0.63</td>
<td>0.24</td>
<td>86.0</td>
<td>5.5</td>
</tr>
<tr>
<td>22</td>
<td>19/0.16</td>
<td>0.80</td>
<td>0.38</td>
<td>53.2</td>
<td>7.4</td>
</tr>
<tr>
<td>20</td>
<td>19/0.20</td>
<td>1.00</td>
<td>0.62</td>
<td>32.4</td>
<td>10.0</td>
</tr>
<tr>
<td>18</td>
<td>19/0.25</td>
<td>1.25</td>
<td>0.96</td>
<td>20.4</td>
<td>14.0</td>
</tr>
<tr>
<td>16</td>
<td>19/0.29</td>
<td>1.44</td>
<td>1.23</td>
<td>15.8</td>
<td>15.5</td>
</tr>
<tr>
<td>14</td>
<td>19/0.36</td>
<td>1.80</td>
<td>1.94</td>
<td>9.9</td>
<td>21.0</td>
</tr>
<tr>
<td>12</td>
<td>37/0.32</td>
<td>2.24</td>
<td>2.97</td>
<td>6.6</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Current carrying capacities are for a single wire and should be de-rated for bundles and / or higher ambient temperature than 20ºC. Contact IS-Group for further information.

### 1b. PRIMARY WIRE Selection Examples

<table>
<thead>
<tr>
<th>Wire Type</th>
<th>Temp. Range ºC</th>
<th>Voltage Rating</th>
<th>Chemical Resistance</th>
<th>Abrasion Resistance</th>
<th>Flexibility</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTFE wire</td>
<td>-75 to +260</td>
<td>300V, 600V, 1000V</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>High Temperature, Chemical Resistance</td>
</tr>
<tr>
<td>44 Wire</td>
<td>-65 to +150</td>
<td>600V, 1000V, 2500V</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Good</td>
<td>Tough, Flexible, Small Size, Lightweight</td>
</tr>
<tr>
<td>55 Wire</td>
<td>-65 to +200</td>
<td>450V, 600V</td>
<td>Very Good</td>
<td>Excellent</td>
<td>Fair</td>
<td>Ultra lightweight, Arc Tracking Resistant</td>
</tr>
<tr>
<td>99 Wire</td>
<td>-55 to +125</td>
<td>600V, 1000V</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Low Flammability, Toxicity and Smoke</td>
</tr>
<tr>
<td>100 Wire</td>
<td>-40 to +125</td>
<td>300V</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Low Fire Hazard and Halogen Free</td>
</tr>
</tbody>
</table>
## Custom Cable Designs
### 2. Cable Jacket Selection
#### Multi-conductor cables

There is an unrivalled selection of medium to high performance cable jacket materials covering a wide operating temperature range, for various applications.

We offer the unique choice of a cross-linked heat-shrink jacket for short run and prototype cables or an extruded jacket for larger scale production requirements. In both cases, the combination of the right primary wire with a matched cable jacket will produce the optimum solution for your specific cable application.

---

### 2a. HEAT-SHRINK Jacket Selection
**Prototype Cables**

<table>
<thead>
<tr>
<th></th>
<th>Temperature Range ºC</th>
<th>Chemical Resistance</th>
<th>Abrasion Resistance</th>
<th>Flexibility</th>
<th>Typical Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTFE</td>
<td>-67 to +250</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>Aerospace, Industrial Sensors, Thermocouples</td>
</tr>
<tr>
<td>RW-200-E</td>
<td>-55 to +200</td>
<td>Very Good</td>
<td>Good</td>
<td>Good</td>
<td>Military, Aerospace, Industrial</td>
</tr>
<tr>
<td>DR-25</td>
<td>-75 to +150</td>
<td>Very Good</td>
<td>Fair</td>
<td>Very Good</td>
<td>Aerospace, Autosport, Military</td>
</tr>
<tr>
<td>RNF-100</td>
<td>-55 to +135</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Military, Industrial, Commercial</td>
</tr>
<tr>
<td>ZHTM</td>
<td>-30 to +105</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>Marine, Rail and Mass Transit</td>
</tr>
<tr>
<td>VERSAFIT</td>
<td>-55 to +135</td>
<td>Fair</td>
<td>Fair</td>
<td>Good</td>
<td>General Purpose, Commercial</td>
</tr>
</tbody>
</table>

### 2b. EXTRUDED Jacket Selection
**Production Cables**

<table>
<thead>
<tr>
<th></th>
<th>Temperature Range ºC</th>
<th>Chemical Resistance</th>
<th>Abrasion Resistance</th>
<th>Flexibility</th>
<th>Typical Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTFE</td>
<td>-67 to +260</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>Aerospace, Industrial Sensors, Thermocouples</td>
</tr>
<tr>
<td>FEP</td>
<td>-65 to +200</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Instrumentation, Industrial, Commercial</td>
</tr>
<tr>
<td>FDR 25</td>
<td>-40 to +150</td>
<td>Very Good</td>
<td>Fair</td>
<td>Very Good</td>
<td>Aerospace, Autosport, Military</td>
</tr>
<tr>
<td>THERMORAD</td>
<td>-55 to +125</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Military, Industrial, Commercial</td>
</tr>
<tr>
<td>ZEROHAL</td>
<td>-30 to +105</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Marine, Rail and Mass Transit</td>
</tr>
<tr>
<td>POLYURETHANE</td>
<td>-25 to +80</td>
<td>Fair</td>
<td>Fair</td>
<td>Very Good</td>
<td>General Purpose, Commercial</td>
</tr>
</tbody>
</table>
Building Blocks Shortlist

This guide is designed to help you identify the building blocks necessary to create a custom multicore cable design;

- What is your application/end use?
- What temperature rating is required?
- How many components are needed?
- What is each component used for (data, signal or power)?
- What would be the conductor size of the components?
- Are there any electrical shielding (EMI) requirements? If so, please list specifics such as component and or cable shielding.
- Are there specific flexibility, mechanical, or fluid resistance requirements? If so, please list specifics and rank the order of importance.
- Do you require specific or continuous lengths?
- Is there a customer specification involved? If so, please provide a copy.
- List any time lines and annual usage estimates.

PTFE -67°C to +260°C

Polytetrafluoroethylene (PTFE) is a fluorocarbon polymer insulation material that allows wiring systems to be used and operated in the most demanding of environments. Resistant to lubricants and fuels, very flexible, plus it has excellent thermal and electrical properties. Particularly suitable for applications requiring high levels of thermal and chemical resistance.

FEP -65°C to +200°C

Fluorinated Ethylene Propylene (FEP) specialised material for low temperature flexibility, enhanced abrasion resistance. Can be over moulded.

FDR 25 -40°C to +150°C

Highly flame retardant and qualified to VG standards. Originally designed for use in compartments exposed to hot diesel fuels and vibration. Fluid resistant, flexible, high temperature.

THERMORAD F -55°C to +125°C

General purpose material unaffected by most common chemicals and solvents. Highly flame retardant and has an overall balance of physical and chemical properties.

THERMORAD HTF -20°C to +200°C

Very high temperature fluoroelastomer, fluid resistant. Excellent stability during continuous high temperature exposure to adverse chemical environments, ideal for aircraft fuel tanks and engine cables.

ZEROHAL -30°C to +105°C

LFH (Low Fire Hazard), halogen-free cable jacket material developed and approved to the most exacting requirements for low fire hazard cables in many countries.
The screening of cables is important, whether to minimise cross-talk within the cable, the prevention of interference from external sources, or the elimination of radiation from the cable itself.

Effective design of cables to provide shielding over a broad frequency spectrum is complex and must be tailored to specific electromagnetic environments. From simple aluminised Polyester, to more complex and comprehensive shielding incorporating plated copper braids and Mu metal wraps.

Conventional braiding methods can be improved by computer optimisation, which can give many times the shielding performance of a basic shield with minimal weight penalty or increase in optical coverage. Super screened cable combines Mu metal wraps with optimised braids to provide even further enhanced performance, especially at low frequencies.

Aluminised Mylar
Offers first level of protection for standard Electrostatic screening applications.

Single Braid
Increased screening level offering low level EMI and low sensitivity environments.

Single Optimised Braid
Further improved braid screen for sensitive lines and high EMI work.

Double Optimised Braid
Two layers of braid screen offering protection for highly sensitive lines and severe EMI.

Double Optimised Braids + Mu Metal Wrap
As above but with interlayer of screening, known as Super screened, this cable is suitable for very high protection levels EMP/Tempest.

Triple Optimised Braids + Mu Metal Wrap x2
The double and triple Super screened cable is recommended for the severest of environmental applications.
The problems of shielding cables are complex but with the introduction of double and triple optimised braids we have the solution for the most difficult shielding issues. Shielding of cables without degrading cable flexibility can be provided for coaxial and multi-conductor cables. To complement this range of cables we can offer cable terminations, connectors, shielded moulded parts and connector back fittings to give a total screening performance.

3. Screening Performance of Various Types of Screen Constructions

Note: For further information, technical data or assistance with your specific application requirements, please contact us.
Custom Cable Designs
4. Design Options
Multi-conductor cables

In addition to those choices already covered there are a number of further design options and components available to cable designers. Careful consideration must be given to the selection of these options and components to achieve the right combination of physical, chemical and electrical properties and to ensure that the finished cable is perfectly designed for its intended application.

Coiled Cables
Coiled or extensible cables are utilised for applications needing a combination of a high degree of flexibility, space constraints and the need to be extended and retracted. The ability to supply cable designs as extensible cables using a wide range of coil diameters lengths facilitates the provision of cable for equipment such as headsets and communication equipment for example.

Tape Wrap
This option of a spirally or longitudinally applied tape material wrapped around insulated or uninsulated wire used as a mechanical barrier and a means of bundling the multicore cable. Tape wraps are often used between wire conductors and braided screens.

Fillers
A non-functional component used to fill large interstices within a cable, thus providing a concentric construction. A ‘filler’ can be a solid core of polymer made from the same or similar material as the cable components.

Lay Length
A term used in cable manufacturing to denote the distance of advance of one member, or a group of spirally twisted members in one turn, measured axially. The lay of any helical element of a cable or conductor is the axial length of a turn of the helix of that element. Altering the lay length of a cable can result in a change in the cables flexibility.

Binder
A spiral wrapping of a thread to hold together the members of a cable as an alternative to a tape wrap.

Strain Relief
A tread or rope, usually manufactured from Kevlar, located down the centre of a cable to provide strain relief to its wire components after installation.

Drain Wire
An uninsulated conductor laid over the components of a foil-shielded cable and used as a ground connection.
### Wire Bundle Multiplication Factors
#### Equal Size Wires

The table right provides multiplication factors for wire bundles of 1 to 61. To determine the approximate diameter of a wire bundle when the wires are all the same size, find the factor for the number of wires in the bundle and multiply the wire diameter by that factor.

#### Calculation of Wire Bundle

### Different Size Wires

To determine the wire bundle diameter when using wires of different sizes, follow steps:

1. Determine the number of wires in the wire bundle.
2. Find the diameter of the wires in the Wire and Cable section of this catalogue.
3. Calculate the cable bundle outside diameter by using the example below.

**Example: A bundle of wires containing:**

- 3 wires of 44A0111-22 (@ 1.19mm dia.)
- 5 wires of 44A0111-20 (@ 1.40mm dia.)
- 1 wire of 44A0111-18 (@ 1.65mm dia.)

\[
D = 1.2 \sqrt{(3 \times 1.19^2 + 5 \times 1.40^2 + 1 \times 1.65^2)}
\]

\[
D = 1.2 \sqrt{(3 \times 1.42 + 5 \times 1.96 + 1 \times 2.72)}
\]

\[
D = 1.2 \sqrt{(4.26 + 9.80 + 2.72)}
\]

\[
D = 1.2 \times 4.10
\]

\[
D = 4.92\text{mm}
\]

### Resistance and Current Carrying Capacity

<table>
<thead>
<tr>
<th>Conductor Size (AWG) Tinned Cu</th>
<th>30</th>
<th>28</th>
<th>26</th>
<th>24</th>
<th>22</th>
<th>20</th>
<th>18</th>
<th>16</th>
<th>14</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Resistance Ohms/km @ 20°C</td>
<td>356</td>
<td>225</td>
<td>135</td>
<td>86.0</td>
<td>53.2</td>
<td>32.4</td>
<td>20.4</td>
<td>15.8</td>
<td>9.9</td>
<td>6.6</td>
</tr>
<tr>
<td>Current Carrying Capacity (amps)</td>
<td>2.2</td>
<td>2.9</td>
<td>4.1</td>
<td>5.5</td>
<td>7.4</td>
<td>10.0</td>
<td>14.0</td>
<td>15.5</td>
<td>21.0</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Current carrying capacity for 30°C rise above 20°C ambient

| Current Carrying Capacity Multiplying Factor for multicore cables of the same size |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|
| Number of Cores | 2 | 3 | 4 | 7 | 9 | 12 | 15 | 18 | 21 | 24 |
| Derating Factor   | 0.825 | 0.73 | 0.66 | 0.54 | 0.49 | 0.43 | 0.39 | 0.36 | 0.33 | 0.31 |
|                   | 0.29 | 0.28 | 0.26 | | | | | | | |