# TECHNICAL DATA

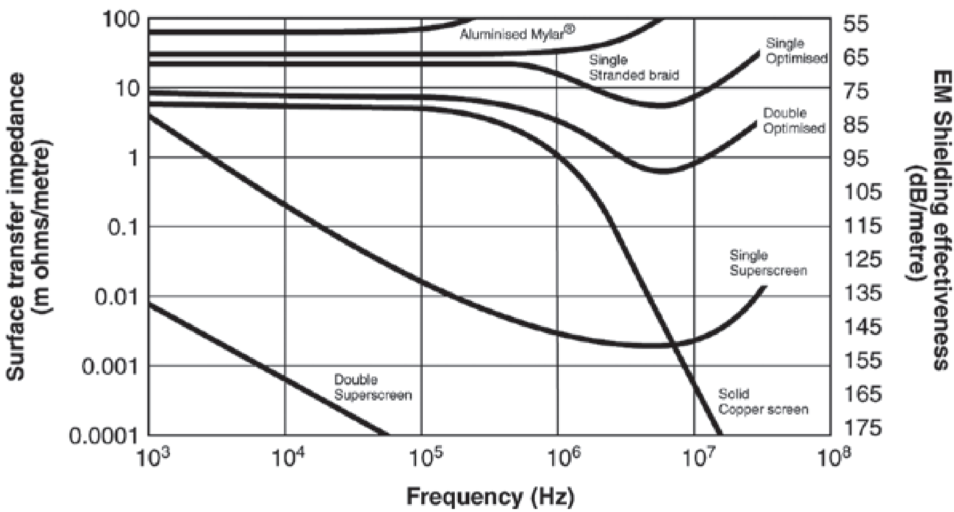
## Electrical Shielding



### Design and Manufacturing Expertise

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.

### Screening Performance of Various Types of Screen Constructions




**Note:** For further information, technical data or assistance with your specific application requirements, please contact us.

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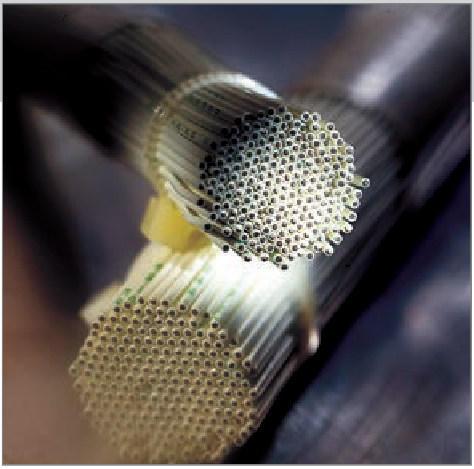
## Wire Bundle Sizing





### Multiplication Factors for Wire Bundles with Equal Size Wires

This table 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 Bundles for Different Size Wires

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

1 Determine the number of wires in the wire bundle.

2 Find the diameter of the wires in the Wire & Cable section of this catalogue.

3 Calculate the cable bundle outside diameter by using the method shown below.

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

3 x 44A0111-22 (1.19mm dia.)
5 x 44A0111-20 (1.40mm dia.)
1 x 44A0111-18 (1.65mm dia.)

$D = 1.2 \sqrt{(3 \times 1.19^2 + 5 \times 1.40^2 + 1 \times 1.65^2)}$
$D = 1.2 \sqrt{(3 \times 1.4 + 5 \times 2.0 + 1 \times 2.7)}$
$D = 1.2 \sqrt{(4.2 + 10.0 + 2.7)}$
$D = 1.2 \sqrt{(17)}$
$D = 1.2 \times 4.12$
$D = 4.95\text{mm}$

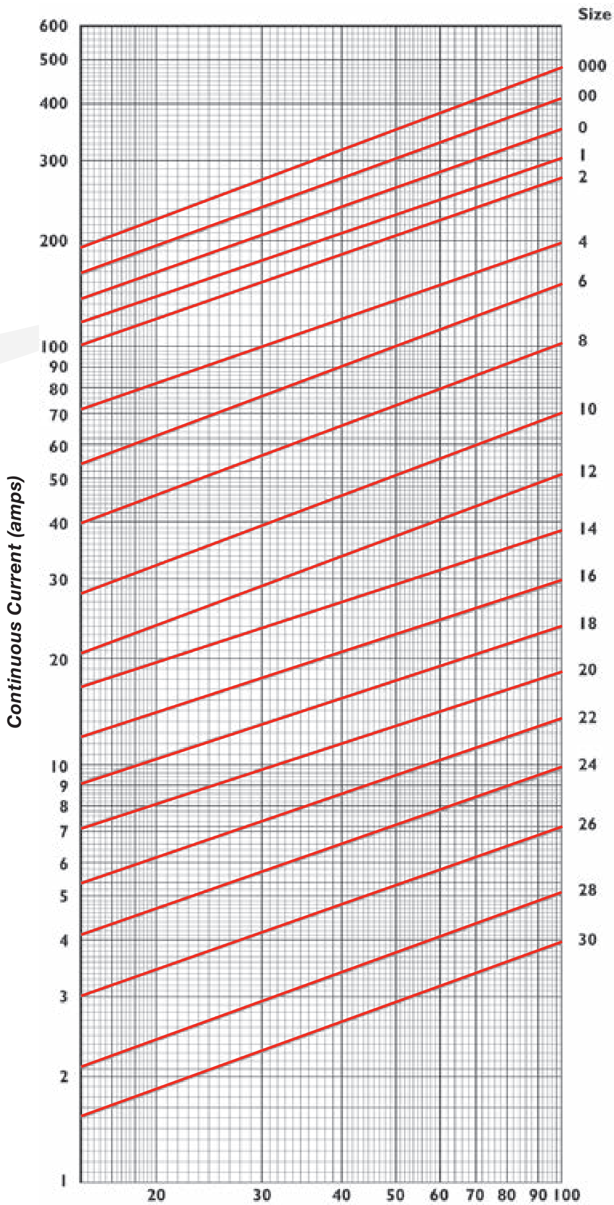
| Number of Wires | Multiplication Factor |
|---|---|
| 1 | 1.00 |
| 2 | 2.00 |
| 3 | 2.16 |
| 4 | 2.41 |
| 5 | 2.70 |
| 6, 7 | 3.00 |
| 8 | 3.60 |
| 9, 10, 11, 12 | 4.00 |
| 13, 14 | 4.41 |
| 15, 16 | 4.70 |
| 17, 18, 19 | 5.00 |
| 20, 21 | 5.31 |
| 22, 23, 24 | 5.61 |
| 25, 26, 27 | 6.00 |
| 28, 29, 30 | 6.41 |
| 31, 32, 33 | 6.70 |
| 34, 35, 36, 37 | 7.00 |
| 38, 39 40 | 7.31 |
| 41, 42, 43, 44 | 7.61 |
| 45, 46, 47, 48 | 8.00 |
| 49, 50, 51, 52 | 8.41 |
| 53, 54, 55, 56 | 8.70 |
| 57, 58, 59, 60, 61 | 9.00 |

# TECHNICAL DATA

## Temperature Rise by Current

### Guidelines






*Conductor Temperature Rise Above Ambient*

The graph illustrates the conductor temperature rise of a single insulated wire in 'Free Air'.

**Table A**
Conductor size, resistance and current carrying capacity.

**Table B**
Multiplying factor for multicore cables of the same size.

Example for 22 AWG twisted pair
7.4 amps (single) x 0.825 = 6.1 amps

**Table A**

| Conductor Size (AWG) | Max Resistance (Tinned Cu) Ohms/ km @ 20°C | Current carrying capacity (amps) for 30°C rise above 20°C ambient |
|---|---|---|
| **30** | 356.0 | 2.2 |
| **28** | 225.0 | 2.9 |
| **26** | 135.0 | 4.1 |
| **24** | 86.0 | 5.5 |
| **22** | 53.2 | 7.4 |
| **20** | 32.4 | 10.0 |
| **18** | 20.4 | 14.0 |
| **16** | 15.8 | 15.5 |
| **14** | 9.9 | 21.0 |
| **12** | 6.6 | 28.0 |

**Table B**

| Number of Cores | Derating Factor |
|---|---|
| 2 | 0.825 |
| 3 | 0.73 |
| 4 | 0.66 |
| 7 | 0.54 |
| 9 | 0.49 |
| 12 | 0.43 |
| 15 | 0.39 |
| 18 | 0.36 |
| 21 | 0.33 |
| 24 | 0.31 |
| 27 | 0.29 |
| 30 | 0.28 |
| 37 | 0.26 |