By far the largest and most important component of any structural lightning protection or earthing system is the actual conductor.

Selection of the correct conductor type for the installation is highly important, and is likely to be the initial consideration of a lightning protection or earthing system designer.

A comprehensive range of Furse copper and aluminium conductors are available in each of the main world standard formats, i.e. flat tape, solid circular and stranded. Additionally each format is available in a variety of conductor sizes, to meet differing lightning protection and earthing requirements.

Specification will depend on whether the application is for an above ground structural lightning protection system, or a below ground earthing installation.

Conductors for structural lightning protection systems

Furse lightning protection conductors are available in copper and aluminium, and are supplied bare or with PVC coating (see below). For most installations, copper is specified due to its high conductivity and anti-corrosive properties.

The following sizes are suitable for the majority of above ground lightning protection systems:

Flat tape conductor:

25 x 3 mm bare tape, or 25 x 3 mm PVC covered tape

Solid circular conductor

8 mm diameter bare or PVC covered solid circular conductor

Stranded conductor

70 mm^2 bare or PVC covered stranded conductor

Conductor colour chart

The choice of a lightning protection conductor is usually governed by its aesthetic impact on the structure to be protected. For many people the term lightning conductor conjures up an image of a discoloured copper strip running down the spire of a church. This would clearly be unacceptable to the owner/architect of a modern structure.

In order to reduce the impact of an external system Furse offer a range of UV stabilized PVC covered tapes and solid circular conductors in colours chosen to match most common building materials.

Standard PVC colours are shown in the chart, right, with special colours available to order.

Black	**18B29***	
Green	**BS 6746C**	
Grey	**00A07***	
Stone	**08B23***	
White	**10B15***	
Brown	**06C39***	

* PVC colours to BS 5252

Conductors

Conductors for earthing systems

Furse earthing conductors form an integral part of the single earthing arrangement for a structure, whether they provide the means of connection to the final earth electrode (earth rod or plate), or whether they comprise the earth electrode itself (through an earth grid or ring earth arrangement).

An earth conductor must be capable of carrying the maximum expected earth fault current and leakage current likely to occur at a structure.

The size or minimum cross-sectional area of the conductor must therefore be gauged in accordance with these criteria.

A good earth conductor must also:

- be able to withstand mechanical damage
- be compatible with the material of the earth electrode, and
- resist the corrosive effect of local soil conditions

Furse conductors effectively meet these requirements and are available in a range of sizes to meet differing current ratings (see table below).

Copper conductor is recommended as, following BS 7430, aluminium should not be installed in contact with soil, nor in damp areas, and it should not be used to make the final connection to an earth electrode.

Copper conductor ratings

For below ground earthing applications we produce a large range of bare copper, tape and stranded conductors thus offering the designer of the system the correctly rated conductor without the need to oversize.

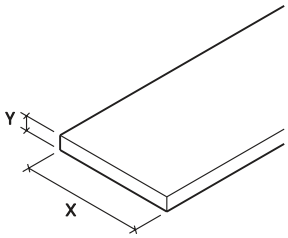
The following conductor ratings are based upon the recommendations of BS 7430 with an initial conductor temperature of 30 °C and a maximum temperature of 250 °C.

Conductor size	C.S.A. (mm^2)	kA for 1 sec	kA for 3 sec	Conductor size	C.S.A. (mm^2)	kA for 1 sec	kA for 3 sec
12.5 x 1.5 mm	18.75	3.3	1.9	31 x 6 mm	186	32.7	18.9
12.5 x 3 mm	37.5	6.6	3.8	38 x 3 mm	114	20.1	11.6
20 x 1.5 mm	30	5.3	3.0	38 x 5 mm	190	33.4	19.3
20 x 3 mm	60	10.6	6.1	38 x 6 mm	228	40.1	23.2
25 x 1.5 mm	37.5	6.6	3.8	40 x 3 mm	120	21.1	12.2
25 x 3 mm	75	13.2	7.6	40 x 4 mm	160	28.2	16.3
25 x 2 mm	50	8.8	5.1	40 x 5 mm	200	35.2	20.3
25 x 4 mm	100	17.6	10.2	40 x 6 mm	240	42.2	24.4
25 x 6 mm	150	26.4	15.2	40 x 6.3 mm	252	44.4	25.6
30 x 2 mm	60	10.6	6.1	50 x 3 mm	150	26.4	15.2
30 x 3 mm	90	15.8	9.1	50 x 4 mm	200	35.2	20.3
30 x 4 mm	120	21.1	12.2	50 x 5 mm	250	44.0	25.4
30 x 5 mm	150	26.4	15.2	50 x 6 mm	300	52.8	30.5
31 x 3 mm	93	16.4	9.5	50 x 6.3 mm	315	55.4	32.0
31.5 x 4 mm	126	22.2	12.8	50 x 7 mm	350	61.6	35.5

Bare copper tape

Conductor size (X x Y)	Weight per metre	Standard coil size	Part No.	
12.5 x 1.5 mm	0.17 kg	100 m	TC005	
12.5 x 3 mm	0.33 kg	100 m	TC010	
20 x 1.5 mm	0.27 kg	100 m	TC015	
20 x 3 mm	0.53 kg	50 m	TC020	
20 x 3 mm	0.53 kg	100 m	TC020/100	
25 x 1.5 mm	0.33 kg	100 m	TC025	
25 x 2 mm	0.49 kg	50 m	TC026	NEW
25 x 3 mm	0.67 kg	25 m	TC030	
25 x 3 mm	0.67 kg	50 m	TC030/50	
1" x ⅛"	0.67 kg	25 m	TC030-UL†	
25 x 4 mm	0.89 kg	50 m	TC035	
25 x 6 mm	1.33 kg	40 m	TC040	
1" x ¼"	1.33 kg	40 m	TC040-UL†	
30 x 2 mm	0.53 kg	50 m	TC039	
30 x 3 mm	0.80 kg	50 m	TC042	
30 x 4 mm	1.07 kg	40 m	TC044	
30 x 5 mm	1.33 kg	40 m	TC043	
31 x 3 mm	0.83 kg	50 m	TC045	
31.5 x 4 mm	1.13 kg	40 m	TC048	
31 x 6 mm	1.65 kg	30 m	TC050	
38 x 3 mm	1.01 kg	50 m	TC055	
38 x 5 mm	1.69 kg	30 m	TC060-FU	
38 x 6 mm	2.02 kg	25 m	TC065	
40 x 3 mm	1.06 kg	40 m	TC067	
40 x 4 mm	1.42 kg	30 m	TC066	
40 x 5 mm	1.78 kg	25 m	TC071	
40 x 6 mm	2.16 kg	25 m	TC068	
40 x 6.3 mm	2.24 kg	25 m	TC069	
50 x 3 mm	1.33 kg	40 m	TC070	
50 x 4 mm	1.78 kg	30 m	TC075	
50 x 5 mm	2.22 kg	20 m	TC078	
50 x 6 mm	2.68 kg	20 m	TC080†	
50 x 6.3 mm	2.80 kg	20 m	TC082	
50 x 7 mm	3.08 kg	20 m	TC090	NEW

TC030

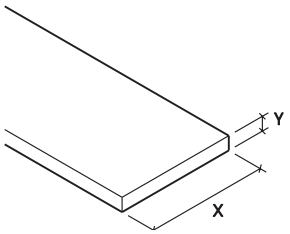


High conductivity copper tape to BS EN 13601 (formerly BS 1432).
†UL96 (TC030-UL, TC040-UL, TC080)

All bare copper tape sold in full coil lengths only.

Bare aluminium tape

TA030

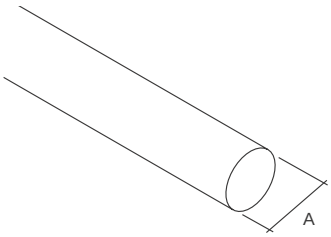


Conductor size (X x Y)	Weight per metre	Standard coil size	Part No.
12.5 x 1.5 mm	0.05 kg	50 m	TA005
20 x 3 mm	0.17 kg	50 m	TA020
25 x 3 mm	0.21 kg	50 m	TA030
30 x 3 mm	0.25 kg	50 m	TA042
25 x 6 mm	0.42 kg	50 m	TA040
40 x 6 mm	0.67 kg	50 m	TA068
50 x 6 mm	0.85 kg	50 m	TA080

Aluminium tape to BS EN 755-5.

Bare solid circular

CD035



Conductor material	Diameter (A)	Cross-sectional area	Weight per metre	Standard coil size	Part No.
Copper	8 mm	50.27 mm²	0.44 kg	50 m	CD035
Aluminium	8 mm	50.27 mm²	0.12 kg	50 m	CD080

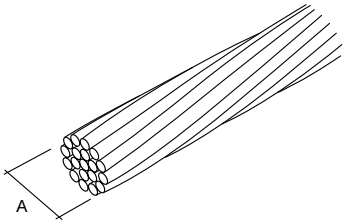
Copper conductor to BS EN 13601 (formerly BS 1433).
Aluminium conductor to BS EN 755-5.

Bare stranded copper cable

Cross-sectional area	Stranding No./ mm Ø	Nominal diameter (A)	Weight per metre	Part No.
Soft drawn stranded copper cable				
6 mm²	7/1.04	3.12 mm	0.05 kg	CB006
16 mm²	7/1.70	5.10 mm	0.15 kg	CB016
25 mm²	7/2.14	6.42 mm	0.23 kg	CB025
35 mm²	7/2.52	7.56 mm	0.32 kg	CB035
50 mm²	19/1.78	8.90 mm	0.43 kg	CB050-FU
70 mm²	19/2.14	10.70 mm	0.62 kg	CB070
95 mm²	19/2.52	12.60 mm	0.86 kg	CB095
120 mm²	37/2.03	14.21 mm	1.09 kg	CB120
150 mm²	37/2.25	15.75 mm	1.33 kg	CB150-FU
185 mm²	37/2.52	17.64 mm	1.67 kg	CB185
240 mm²	61/2.25	20.25 mm	2.20 kg	CB240
300 mm²	61/2.52	22.68 mm	2.76 kg	CB300-FU
400 mm²	61/2.85	25.65 mm	3.53 kg	CB400-FU
Tinned soft drawn stranded copper cable				
70 mm²	19/2.14	-	0.62 kg	CB070-T* NEW
Hard drawn stranded copper cable				
70 mm²	7/3.55	-	0.64 kg	CB071*

* Additional sizes available on request.

CB070

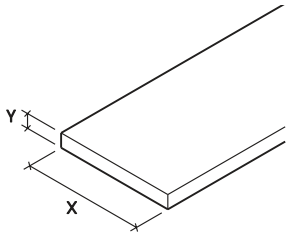


Soft drawn stranded copper cable to BS EN 60228.
Hard drawn stranded copper cable to BS 7884.

Tinned copper tape

Conductor size (X x Y)	Weight per metre	Standard coil size	Part No.
12.5 x 1.5 mm	0.17 kg	100 m	TC225-FU
25 x 3 mm	0.67 kg	50 m	TC230
1" x ⅛"	0.67 kg	50 m	TC230-UL†
30 x 2 mm	0.53 kg	50 m	TC239
25 x 6 mm	1.33 kg	40 m	TC240
31 x 3 mm	0.83 kg	50 m	TC245
38 x 5 mm	1.69 kg	30 m	TC260
50 x 6 mm	2.68 kg	20 m	TC280

TC230



High conductivity copper tape to BS EN 13601 (formerly BS 1432).
†UL96 (TC230-UL)

Bimetallic cable

BC011

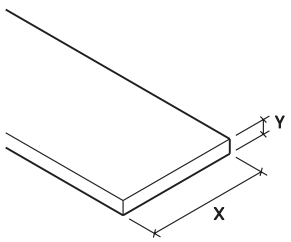
AWG	Cross-sectional area	Nominal diameter	Stranding No./AWG	Weight per metre	Part No.
1/0	50 mm²	9.96 mm	3/5	0.41 kg	BC001
1	40 mm²	8.86 mm	3/6	0.33 kg	BC002
2	35 mm²	7.9 mm	3/7	0.26 kg	BC003
3	25 mm²	7.04 mm	3/8	0.21 kg	BC004
4	20 mm²	6.27 mm	3/9	0.16 kg	BC005
5	16 mm²	5.59 mm	3/10	0.13 kg	BC006
6	10 mm²	4.42 mm	3/12	0.08 kg	BC007
300	150 mm²	15.6 mm	7/4	1.22 kg	BC008
4/0	120 mm²	13.9 mm	7/5	0.97 kg	BC009
3/0	95 mm²	12.3 mm	7/6	0.77 kg	BC010
2/0	70 mm²	11 mm	7/7	0.61 kg	BC011
1/0	50 mm²	9.78 mm	7/8	0.48 kg	BC012
1	40 mm²	8.71 mm	7/9	0.38 kg	BC013
2	35 mm²	7.77 mm	7/10	0.30 kg	BC014

40% conductivity supplied as standard. Other sizes also available. Contact us for details.

Copper/steel cable to ASTM B228.

Hard drawn copper bar

BA205



Overall nominal size (X x Y)	Weight per metre	Approximate length	Part No.
Bare hard drawn bar			
25 x 3 mm	0.67 kg	3 m	BA205
25 x 6 mm	1.33 kg	4 m	BA210
38 x 6 mm	2.03 kg	4 m	BA225
50 x 6 mm	2.67 kg	3 m	BA230
50 x 10 mm	4.45 kg	4 m	BA235
75 x 6 mm	4.00 kg	4 m	BA240
100 x 6 mm	5.38 kg	4 m	BA250-FU
Tinned hard drawn bar			
50 x 6 mm	2.67 kg	3 m	BA231*

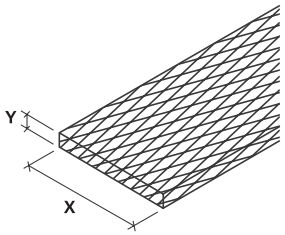
* Additional sizes available on request.

Hard drawn high conductivity copper bar to BS EN 12163.

Flexible flat copper braid

Overall nominal size (X x Y)	Cross-sectional area	Weight per metre	Part No.	
Bare flat braid				
12 x 1 mm	6 mm²	0.055 kg	BD020	
15 x 1.5 mm	10 mm²	0.096 kg	BD025	
19 x 2.5 mm	16 mm²	0.16 kg	BD026	
25 x 3 mm	25 mm²	0.25 kg	BD028	NEW
25 x 3.5 mm	35 mm²	0.34 kg	BD030	
30 x 5 mm	50 mm²	0.49 kg	BD031	NEW
32 x 6 mm	70 mm²	0.63 kg	BD027	
37 x 6 mm	95 mm²	0.93 kg	BD032	NEW
45 x 6 mm	120 mm²	1.15 kg	BD033	NEW
50 x 8 mm	150 mm²	1.45 kg	BD034	NEW
Tinned flat braid				
12 x 1 mm	6 mm²	0.055 kg	BD020-T	NEW
15 x 1.5 mm	10 mm²	0.096 kg	BD025-T	NEW
19 x 2.5 mm	16 mm²	0.16 kg	BD026-T	NEW
25 x 3 mm	25 mm²	0.25 kg	BD028-T	NEW
25 x 3.5 mm	35 mm²	0.34 kg	BD035	
30 x 5 mm	50 mm²	0.49 kg	BD031-T	NEW
32 x 6 mm	70 mm²	0.63 kg	BD027-T	NEW
37 x 6 mm	95 mm²	0.93 kg	BD032-T	NEW
45 x 6 mm	120 mm²	1.15 kg	BD033-T	NEW
50 x 8 mm	150 mm²	1.45 kg	BD034-T	NEW

BD028



Suitable for earth bonding. Also supplied as standard pre-cut and drilled bonds (see pages 104-105). Other sizes and types of braid can be made to order. Please contact us for details.

High conductivity copper wire to BS EN 13602 (formerly BS 4109-C101).

Flexible circular copper braid

BD070-FU

NEW

Overall nominal diameter	Cross-sectional area	Weight per metre	Part No.
Bare circular braid			
4.2 mm	6 mm²	0.055 kg	BD006-FU
5.4 mm	10 mm²	0.096 kg	BD010-FU
7 mm	16 mm²	0.16 kg	BD016-FU
8.5 mm	25 mm²	0.25 kg	BD025-FU
10.5 mm	35 mm²	0.34 kg	BD035-FU
11.5 mm	50 mm²	0.49 kg	BD050-FU
14.5 mm	70 mm²	0.63 kg	BD070-FU
16 mm	95 mm²	0.93 kg	BD095-FU
Tinned circular braid			
4.2 mm	6 mm²	0.055 kg	BD006-FU-T
5.4 mm	10 mm²	0.096 kg	BD010-FU-T
7 mm	16 mm²	0.16 kg	BD016-FU-T
8.5 mm	25 mm²	0.25 kg	BD025-FU-T
10.5 mm	35 mm²	0.34 kg	BD035-FU-T
11.5 mm	50 mm²	0.49 kg	BD050-FU-T
14.5 mm	70 mm²	0.63 kg	BD070-FU-T
16 mm	95 mm²	0.93 kg	BD095-FU-T

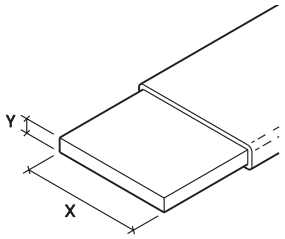
Suitable for earth bonding. Also supplied as standard pre-cut and drilled bonds (see pages 104-105). Other sizes and types of braid can be made to order. Please contact us for details.

High conductivity copper wire to BS EN 13602 (formerly BS 4109-C101).

PVC covered copper tape

Conductor size (X x Y)	Weight per metre	Standard coil size	Colour range	Part No.
12.5 x 1.5 mm	0.21 kg	50 m	Black	TC100
25 x 3 mm	0.77 kg	25 m	Black	TC105-FU
25 x 3 mm	0.77 kg	25 m	Green*	TC110
25 x 3 mm	0.77 kg	25 m	Grey	TC115-FU
25 x 3 mm	0.77 kg	25 m	Stone	TC120-FU
25 x 3 mm	0.77 kg	25 m	White	TC125-FU
25 x 3 mm	0.77 kg	25 m	Brown	TC130
25 x 3 mm	0.77 kg	50 m	Black	TC105/50
25 x 3 mm	0.77 kg	50 m	Green*	TC110/50
25 x 3 mm	0.77 kg	50 m	Grey	TC115/50
25 x 3 mm	0.77 kg	50 m	Stone	TC120/50
25 x 3 mm	0.77 kg	50 m	White	TC125/50
25 x 3 mm	0.77 kg	50 m	Brown	TC130/50
25 x 6 mm	1.53 kg	40 m	Green*	TC140-FU
50 x 6 mm	2.95 kg	20 m	Green*	TC145

TC105-FU



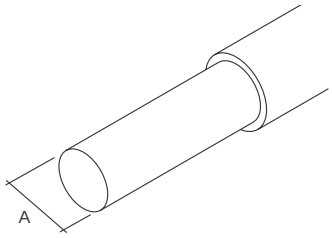
Other colours and sizes are available to order. Contact us for details. Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

High conductivity copper tape to BS EN 13601 (formerly BS 1432).
PVC colours to BS 5252. * Green to BS 6746C.

PVC covered copper solid circular

Conductor material	Diameter (A)	Cross-sectional area	Weight per metre	Standard coil size	Colour range	Part No.
Copper	8 mm	50.27 mm²	0.49 kg	50 m	Black	CD036
Copper	8 mm	50.27 mm²	0.49 kg	50 m	Grey	CD038
Copper	8 mm	50.27 mm²	0.49 kg	50 m	Stone	CD039
Copper	8 mm	50.27 mm²	0.49 kg	50 m	White	CD040
Copper	8 mm	50.27 mm²	0.49 kg	50 m	Brown	CD041

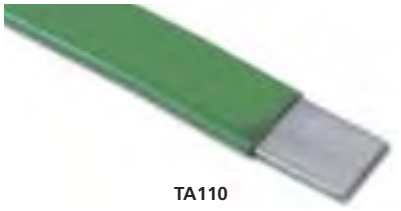
CD036



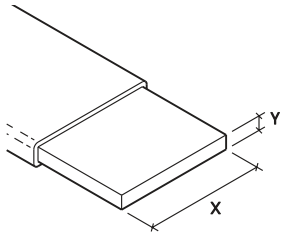
Other colours and sizes are available to order. Contact us for details. Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

Copper conductor to BS EN 13601 (formerly BS 1433).
PVC colours to BS 5252.

PVC covered aluminium tape



TA110



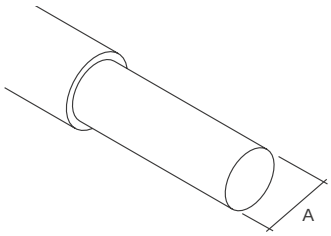
Conductor size (X x Y)	Weight per metre	Standard coil size	Colour range	Part No.
12.5 x 1.5 mm	0.09 kg	50 m	Black	TA100
20 x 3 mm	0. 25 kg	50 m	Black	TA104
25 x 3 mm	0.30 kg	50 m	Black	TA105
25 x 3 mm	0.30 kg	50 m	Green*	TA110
25 x 3 mm	0.30 kg	50 m	Grey	TA115
25 x 3 mm	0.30 kg	50 m	Stone	TA120
25 x 3 mm	0.30 kg	50 m	White	TA125
25 x 3 mm	0.30 kg	50 m	Brown	TA130

Other colours and sizes are available to order. Contact us for details. Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

Aluminium tape to BS EN 755-5.
PVC colours to BS 5252. * Green to BS 6746C.

PVC covered aluminium solid circular

CD081



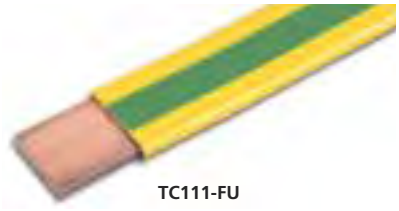
Diameter (A)	Cross-sectional area	Weight per metre	Standard coil size	Colour range	Part No.
8 mm	50.27 mm²	0.18 kg	50 m	Black	CD081
8 mm	50.27 mm²	0.18 kg	50 m	Grey	CD083
8 mm	50.27 mm²	0.18 kg	50 m	Stone	CD084
8 mm	50.27 mm²	0.18 kg	50 m	White	CD085
8 mm	50.27 mm²	0.18 kg	50 m	Brown	CD086

Other colours and sizes are available to order. Contact us for details. Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

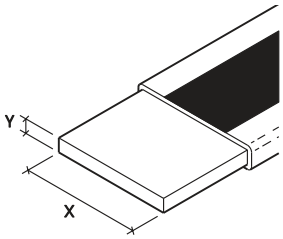
Aluminium conductor to BS EN 755-5.
PVC colours to BS 5252.

Green & yellow PVC insulated copper tape

Conductor size (X x Y)	Weight per metre	Standard coil size	Part No.
25 x 3 mm	0.79 kg	25 m	TC111-FU
25 x 3 mm	0.79 kg	50 m	TC111/50



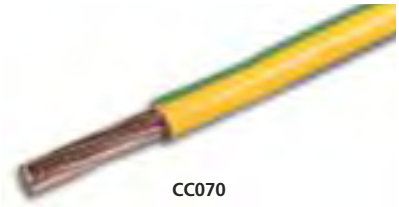
TC111-FU



High conductivity copper tape to BS EN 13601 (formerly BS 1432).
PVC colours to BS 6746C.

Green & yellow PVC insulated stranded copper cable

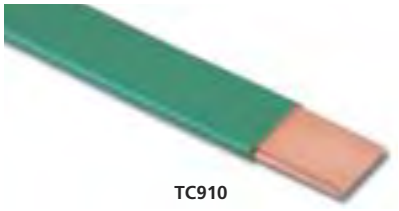
Cross-sectional area	Stranding No./mm Ø	Weight per metre	Part No.
16 mm²	7/1.70	0.19 kg	CC016
25 mm²	7/2.14	0.29 kg	CC025
35 mm²	7/2.52	0.41 kg	CC035
50 mm²	19/1.78	0.53 kg	CC050
70 mm²	19/2.14	0.73 kg	CC070
95 mm²	19/2.52	1.00 kg	CC095
120 mm²	37/2.03	1.16 kg	CC120-FU
150 mm²	37/2.25	1.54 kg	CC150-FU
185 mm²	37/2.52	2.01 kg	CC185
240 mm²	61/2.25	2.49 kg	CC240
300 mm²	61/2.52	3.05 kg	CC300
400 mm²	61/2.85	3.90 kg	CC400-FU



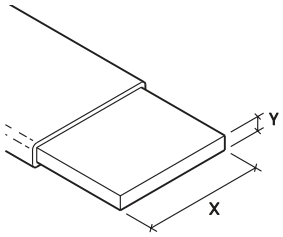
CC070

PVC covered soft drawn stranded copper cable to BS 6004.
PVC colours to BS 6746C.

LSOH covered copper tape



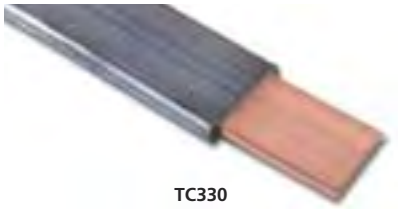
TC910



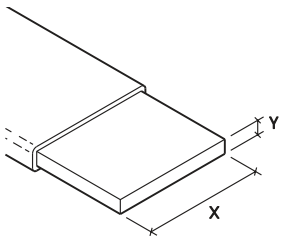
Conductor size (X x Y)	Colour	Weight per metre	Standard coil size	Part No.
25 x 3 mm	Green	0.77 kg	25 m	TC910
25 x 3 mm	Green	0.77 kg	50 m	TC910/50
25 x 6 mm	Green	1.53 kg	40 m	TC940
50 x 6 mm	Green	2.95 kg	20 m	TC980

High conductivity copper tape to BS EN 13601 (formerly BS 1432).
PVC colours to BS 6746C.

Lead covered copper tape



TC330



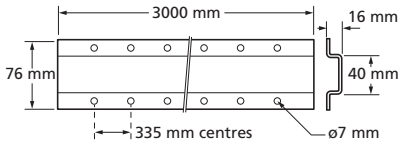
Conductor size (X x Y)	Weight per metre	Standard coil size	Part No.
25 x 3 mm	2.56 kg	25 m	TC330

High conductivity copper tape to BS EN 13601 (formerly BS 1432).

Anti-vandal down conductor guard

Length	Weight each	Part No.
3000 mm	2.90 kg	AV005

AV005



Suitable for use with 25 x 3 mm tape.

Fix using roundhead wood screws (Part no. **SW405**) and wall plugs (Part no. **PS305**)