

Conductors

Introduction

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

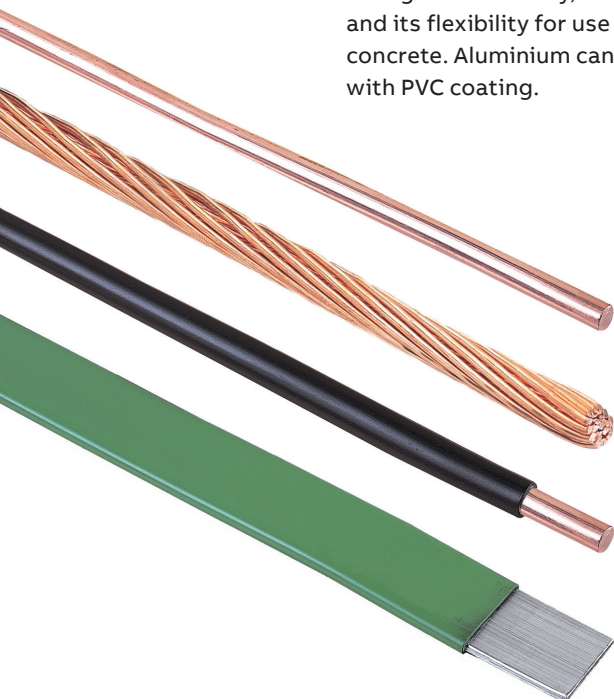
Selection of the correct conductor type for the installation is highly important, and is likely to be the initial consideration of a lightning protection or earthing system designer.

A comprehensive range of Furse copper and aluminium conductors are available in each of the main globally recognised standard formats, i.e. flat tape, solid circular and stranded (note, copper stranded only). 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. Copper can be supplied bare, tinned, PVC, LSOH and lead covered. It is used for most installations due to its high conductivity, anticorrosive properties, and its flexibility for use in air, in earth and in concrete. Aluminium can be supplied bare or with PVC coating.



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**
95/70 mm² bare or PVC covered stranded conductor

Conductor colour chart

Colour	Standard
Black	RAL 9005
Green	BS 6746C
Grey	00A07*
Dark Grey	18B29*
Stone	08B23*
White	10B15*
Brown	06C39*

*PVC colours to BS 5252.

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 protection 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 above, with special colours available to order.

Conductors for earthing systems

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

These conductors provide either the connection to a final earth electrode (earth rod or plate), or the earth electrode itself (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.



Earth conductors

Conductor Size (mm)	C.S.A. (mm ²)	kA for 1 Sec	kA for 3 Sec
20 x 1.5	30	5.3	3.0
20 x 3	60	10.6	6.1
25 x 1.5	37.5	6.6	3.8
25 x 3	75	13.2	7.6
25 x 2	50	8.8	5.1
25 x 4	100	17.6	10.2
25 x 6	150	26.4	15.2
30 x 3	90	15.8	9.1
30 x 4	120	21.1	12.2
30 x 5	150	26.4	15.2
31 x 3	93	16.4	9.5
31.5 x 4	126	22.2	12.8
31 x 6	186	32.7	18.9
38 x 3	114	20.1	11.6
38 x 5	190	33.4	19.3
38 x 6	228	40.1	23.2
40 x 3	120	21.1	12.2
40 x 4	160	28.2	16.3
40 x 5	200	35.2	20.3
40 x 6	240	42.2	24.4
50 x 3	150	26.4	15.2
50 x 4	200	35.2	20.3
50 x 5	250	44.0	25.4
50 x 6	300	52.8	30.5
50 x 7	350	61.6	35.5
50 x 8	400	70.4	40.6
50 x 10	500	88	50.8
60 x 10	600	105.6	61
75 x 6	450	79.2	45.7
80 x 6	480	84.4	48.8
100 x 6	600	105.6	61

These 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.

A good earth conductor must also:

- Be able to withstand mechanical damage
- Be compatible with the material of the earth electrode
- 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 left). 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.



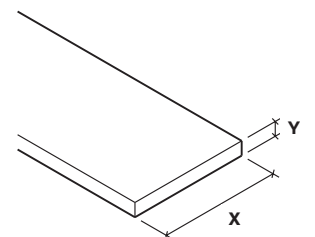
Conductors

Bare conductors

Bare copper tape



Part no.	ABB order code	Conductor size X x Y (mm)	Standard coil size (m)	Weight per metre (kg)	Certification/ standards
TC015	7TCA083010R0054	20 x 1.5	100	0.27	●
TC020	7TCA083010R0060	20 x 3	50	0.53	●
TC020/100	7TCA083010R0061	20 x 3	100	0.53	●
TC026-FU	7TCA083010R0072	25 x 2	50	0.45	●
TC030	7TCA083010R0081	25 x 3	25	0.67	●●
TC030/50	7TCA083010R0097	25 x 3	50	0.67	●
TC030-UL	7TCA083010R0082	1" x 1/8"	25	0.67	●●
TC035	7TCA083010R0127	25 x 4	50	0.89	●
TC040	7TCA083010R0144	25 x 6	40	1.33	●
TC042	7TCA083010R0155	30 x 3	50	0.80	●
TC044	7TCA083010R0167	30 x 4	40	1.07	●
TC043-FU	7TCA083010R0697	30 x 5	40	1.33	●
TC045	7TCA083010R0174	31 x 3	50	0.83	●
TC048	7TCA083010R0177	31.5 x 4	40	1.13	●
TC050	7TCA083010R0185	31 x 6	30	1.65	●
TC055	7TCA083010R0191	38 x 3	50	1.01	●
TC060-FU	7TCA083010R0198	38 x 5	30	1.69	●
TC065	7TCA083010R0209	38 x 6	25	2.02	●
TC067	7TCA083010R0241	40 x 3	40	1.06	●
TC066	7TCA083010R0217	40 x 4	30	1.42	●
TC071	7TCA083010R0272	40 x 5	25	1.78	●
TC068	7TCA083010R0250	40 x 6	25	2.16	●
TC070	7TCA083010R0265	50 x 3	40	1.33	●
TC075	7TCA083010R0279	50 x 4	30	1.78	●
TC078	7TCA083010R0292	50 x 5	20	2.22	●
TC080	7TCA083010R0294	50 x 6	20	2.68	●●
TC090	7TCA083010R0324	50 x 7	10	3.08	●
TC092	7TCA083010R0642	50 x 8	10	3.56	●
TC093	7TCA083010R0679	75 x 6	10	4.00	●
TC094	7TCA083010R0658	50 x 10	10	4.44	●
TC096	7TCA083010R0659	60 x 10	10	5.32	●
TC098	7TCA083010R0660	80 x 6	10	4.32	●
TC099	7TCA083010R0661	100 x 6	10	5.36	●



Certification / Standards: ●BS EN 13601 / ●IEC/BS EN 62561-2 / ●UL 96.

All bare copper tape sold in full coil lengths only.

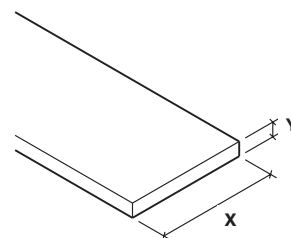
High conductivity annealed copper tape.

Conductors

Bare & tinned conductors

Bare aluminium tape

Part no.	ABB order code	Conductor size X x Y (mm)	Standard coil size (m)	Weight per metre (kg)	Certification/ standards
TA020	7TCA083040R0006	20 x 3	50	0.17	●
TA030	7TCA083040R0011	25 x 3	50	0.21	●●
TA040	7TCA083040R0020	25 x 6	50	0.42	●
TA042	7TCA083040R0022	30 x 3	50	0.25	●
TA068	7TCA083040R0023	40 x 6	50	0.67	●
TA080	7TCA083040R0030	50 x 6	50	0.85	●

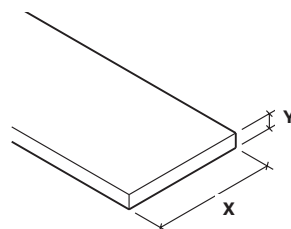


Certification / Standards: ●BS EN 755-5 / ●IEC/BS EN 62561-2.
All bare aluminium tape sold in full coil lengths only.

Tinned copper tape



Part no.	ABB order code	Conductor size X x Y (mm)	Standard coil size (m)	Weight per metre (kg)	Certification/ standards
TC220	7TCA083030R0173	20 x 3	50	0.53	●
TC230	7TCA083030R0030	25 x 3	50	0.67	●●
TC230-UL	7TCA083030R0034	1" x 1/8"	50	0.67	●●●
TC239	7TCA083030R0063	30 x 2	50	0.53	●
TC240	7TCA083030R0075	25 x 6	40	1.33	●
TC245	7TCA083030R0091	31 x 3	50	0.83	●
TC260	7TCA083030R0098	38 x 5	30	1.69	●
TC266	7TCA083030R0101	40 x 4	30	1.42	●
TC280	7TCA083030R0120	50 x 6	20	2.68	●



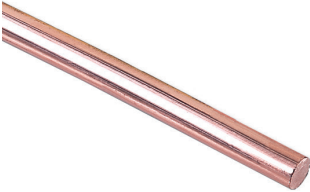
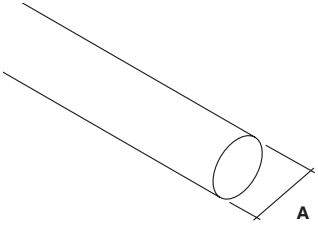
Certification / Standards: ●BS EN 13601 / ●IEC/BS EN 62561-2 / ●UL 96.
All tinned copper tape sold in full coil lengths only.
High conductivity annealed tinned copper tape.

Conductors

Bare solid circular & stranded conductors

Bare solid circular

Part no.	ABB order code	Diameter A (mm)	Cross-sectional area (mm ²)	Standard coil size (m)	Weight per metre (kg)	Certification/standards
Copper conductor						
CD035	7TCA083060R0000	Ø8	50.27	50	0.44	●
Aluminium conductor						
CD080	7TCA083820R0000	Ø8	50.27	50	0.12	●
Tinned copper conductor						
CD235	7TCA083060R0015	Ø8	50.27	50	0.44	●

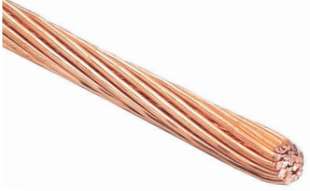
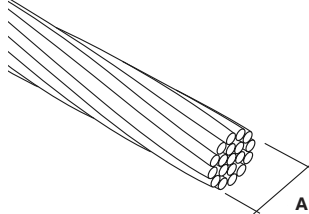



Certification / Standards: ●BS EN 13601 / ●BS EN 755-5.

All solid circular conductor sold in full coil lengths only.

Bare stranded copper cable

Part no.	ABB order code	Cross-sectional area (mm ²)	Stranding no. /mm ø	Diameter A (mm)	Weight per metre (kg)	Certification/standards
Soft drawn stranded copper cable						
CB016	7TCA083080R0001	16	7/1.70	Ø5.10	0.15	●
CB025	7TCA083080R0002	25	7/2.14	Ø6.42	0.23	●
CB035	7TCA083080R0003	35	7/2.52	Ø7.56	0.32	●
CB050-FU	7TCA083080R0004	50	19/1.78	Ø8.90	0.43	●
CB070	7TCA083080R0005	70	19/2.14	Ø10.70	0.62	●
CB095	7TCA083080R0008	95	19/2.52	Ø12.60	0.86	●
CB120-FU	7TCA083080R0009	120	37/2.03	Ø14.21	1.09	●
CB150-FU	7TCA083080R0010	150	37/2.25	Ø15.75	1.33	●
CB185	7TCA083080R0011	185	37/2.52	Ø17.64	1.67	●
CB240-FU	7TCA083080R0041	240	61/2.25	Ø20.25	2.20	●
CB300-FU	7TCA083080R0013	300	61/2.52	Ø22.68	2.76	●
CB400-FU	7TCA083080R0027	400	61/2.85	Ø25.65	3.53	●
Hard drawn stranded copper cable						
CB071*	7TCA083080R0007	70	7/3.55	Ø10.70	0.64	●

Certification / Standards: ●BS EN 60228 / ●BS 7884.

*Additional sizes available on request.

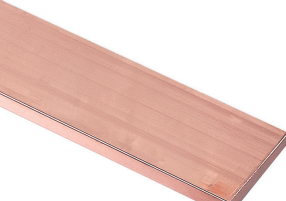
Tinned soft drawn stranded copper cable available on request.

Note: bare stranded copper cable supplied unbranded.

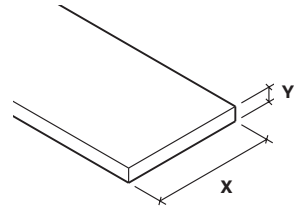
Conductors

Hard drawn bar & flexible braid

Hard drawn copper bar




Part no.	ABB order code	Overall nominal size X x Y (mm)	Approximate length (m)	Weight per metre (kg)	Certification/standards
BA205	7TCA083810R0000	25 x 3	3	0.67	●
BA210	7TCA083810R0002	25 x 6	4	1.33	●
BA225	7TCA083810R0004	38 x 6	4	2.03	●
BA230	7TCA083810R0005	50 x 6	3	2.67	●
BA235	7TCA083810R0008	50 x 10	4	4.45	●
BA240	7TCA083810R0009	75 x 6	4	4.00	●
BA250-FU	7TCA083810R0010	100 x 6	4	5.38	●

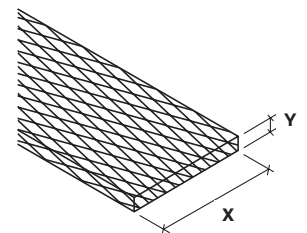


Certification / Standards: ●BS EN 12163.
 Tinned copper variants available to special order.
 Note: hard drawn copper bar supplied unbranded.

Flexible flat copper braid



Part no.	ABB order code	Overall nominal size X x Y (mm)	Cross-sectional area (mm ²)	Weight per metre (kg)	Certification/standards
Bare flat braid					
BD028	7TCA083070R0334	25 x 3	25	0.25	●
BD030	7TCA083070R0005	25 x 3.5	35	0.34	●
BD031	7TCA083070R0362	30 x 5	50	0.49	●
Tinned flat braid					
BD028-T	7TCA083070R0335	25 x 3	25	0.25	●
BD035	7TCA083070R0006	25 x 3.5	35	0.34	●
BD031-T	7TCA083070R0276	30 x 5	50	0.49	●





















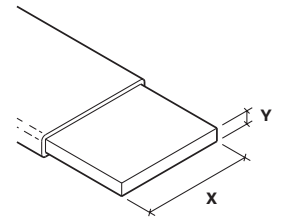
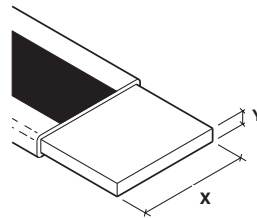
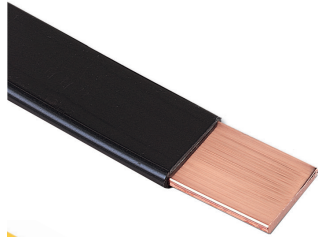
Certification / Standards: ●BS EN 13602.
 Suitable for earth bonding. Also supplied as standard pre-cut and drilled bonds.
 Other sizes and types of braid can be made to order. Please contact us for details.
 Circular braid in a range of cross-sectional areas can be provided on request. Please contact us for details.
 Note: flexible copper braid supplied unbranded.

Conductors

PVC covered conductors

PVC covered copper tape

Part no.	ABB order code	Conductor size X & Y (mm)	Standard coil size (m)	Weight per metre (kg)	Colour range	Certification/standards
TC105-FU	7TCA083020R0038	25 x 3	25	0.77	Black 	●●
TC105/50	7TCA083020R0039	25 x 3	50	0.77	Black 	●●
TC110	7TCA083020R0044	25 x 3	25	0.77	Green 	●●
TC110/50	7TCA083020R0045	25 x 3	50	0.77	Green 	●●
TC111-FU	7TCA083020R0053	25 x 3	25	0.79	Green & yellow 	●●
TC111/50	7TCA083020R0057	25 x 3	50	0.79	Green & yellow 	●●
TC115-FU	7TCA083020R0061	25 x 3	25	0.77	Grey 	●●
TC115/50	7TCA083020R0062	25 x 3	50	0.77	Grey 	●●
TC116-FU	7TCA083020R0067	25 x 3	50	0.77	Dark grey 	●●
TC116/25	7TCA083020R0068	25 x 3	25	0.77	Dark grey 	●●
TC120-FU	7TCA083020R0069	25 x 3	25	0.77	Stone 	●●
TC120/50	7TCA083020R0070	25 x 3	50	0.77	Stone 	●●
TC125-FU	7TCA083020R0076	25 x 3	25	0.77	White 	●●
TC125/50	7TCA083020R0077	25 x 3	50	0.77	White 	●●
TC130	7TCA083020R0083	25 x 3	25	0.77	Brown 	●●
TC130/50	7TCA083020R0084	25 x 3	50	0.77	Brown 	●●
TC140-FU	7TCA083020R0092	25 x 6	40	1.53	Green 	●●
TC145	7TCA083020R0099	50 x 6	20	2.95	Green 	●●








Certification / Standards: ●BS EN 13601 (copper) / ●BS 5252 (PVC colour) / ●BS 6746C (PVC colour).

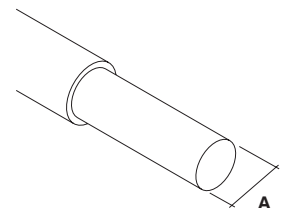
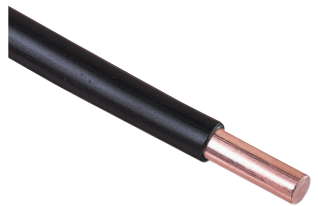
Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

All PVC covered copper tape sold in full coil lengths only.

High conductivity annealed copper tape.

PVC covered copper solid circular

Part no.	ABB order code	Diameter A (mm)	Cross-sectional area (mm ²)	Standard coil size (m)	Weight per metre (kg)	Colour range	Certification/standards
CD036	7TCA083060R0005	Ø8	50.27	50	0.49	Black 	●●
CD038	7TCA083060R0008	Ø8	50.27	50	0.49	Grey 	●●
CD039	7TCA083060R0009	Ø8	50.27	50	0.49	Stone 	●●
CD040	7TCA083060R0010	Ø8	50.27	50	0.49	White 	●●
CD041	7TCA083060R0013	Ø8	50.27	50	0.49	Brown 	●●



Certification / Standards: ●BS EN 13601 (copper) / ●BS 5252 (PVC colour).

























Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.

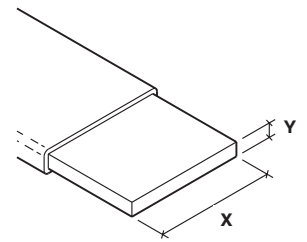
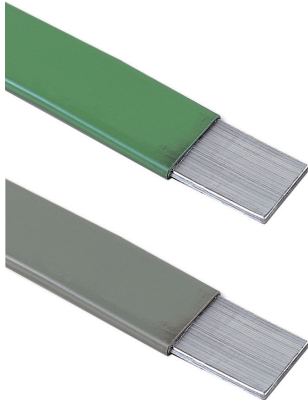
All PVC covered copper solid circular sold in full coil lengths only.




Conductors

PVC covered conductors
















PVC covered aluminium tape

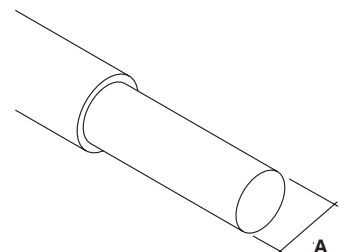
Part no.	ABB order code	Conductor size X & Y (mm)	Standard coil size (m)	Weight per metre (kg)	Colour range	Certification/standards
TA105	7TCA083050R0008	25 x 3	50	0.30	Black 	 
TA110	7TCA083050R0011	25 x 3	50	0.30	Green 	 
TA115	7TCA083050R0015	25 x 3	50	0.30	Grey 	 
TA116	7TCA093050R0019	25 x 3	50	0.30	Dark grey 	 
TA120	7TCA083050R0020	25 x 3	50	0.30	Stone 	 
TA125	7TCA083050R0023	25 x 3	50	0.30	White 	 
TA130	7TCA083050R0030	25 x 3	50	0.30	Brown 	 
TA140	7TCA083050R0035	25 x 6	40	0.63	Green 	 





Certification / Standards:  BS EN 755-5 (aluminium) /  BS 5252 (PVC colour) /  BS 6746C (PVC colour).
 Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.
 All PVC covered aluminium tape sold in full coil lengths only.

PVC covered aluminium solid circular

Part no.	ABB order code	Diameter A (mm)	Cross-sectional area (mm ²)	Standard coil size (m)	Weight per metre (kg)	Colour range	Certification/standards
CD081	7TCA083820R0001	Ø8	50.27	50	0.18	Black 	 
CD083	7TCA083820R0002	Ø8	50.27	50	0.18	Grey 	 
CD084	7TCA083820R0003	Ø8	50.27	50	0.18	Stone 	 
CD085	7TCA083820R0004	Ø8	50.27	50	0.18	White 	 
CD086	7TCA083820R0005	Ø8	50.27	50	0.18	Brown 	 



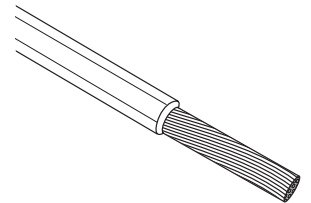
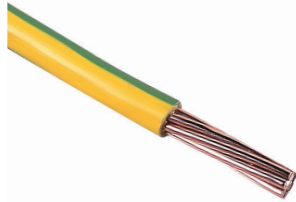
Certification / Standards:  BS EN 755-5 (aluminium) /  BS 5252 (PVC colour).
 Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time.
 All PVC covered aluminium solid circular sold in full coil lengths only.

Conductors

PVC insulated stranded conductor

Green & yellow PVC insulated stranded copper cable

Part no.	ABB order code	Cross-sectional area (mm ²)	Stranding no. / Ø(mm)	Weight per metre (kg)	Certification/ standards
CC016	7TCA083090R0004	16	7/1.70	0.19	●●●
CC025	7TCA083090R0005	25	7/2.14	0.29	●●●
CC035	7TCA083090R0006	35	7/2.52	0.41	●●●
CC050	7TCA083090R0007	50	19/1.78	0.53	●●●
CC070	7TCA083090R0009	70	19/2.14	0.73	●●●
CC095	7TCA083090R0010	95	19/2.52	1.00	●●●
CC120-FU	7TCA083090R0011	120	37/2.03	1.27	●●●
CC150-FU	7TCA083090R0012	150	37/2.25	1.54	●●●
CC185	7TCA083090R0013	185	37/2.52	2.01	●●●
CC240	7TCA083090R0014	240	61/2.52	2.49	●●●
CC300	7TCA083090R0015	300	61/2.52	3.05	●●●
CC400-FU	7TCA083090R0016	400	61/2.85	3.90	●●●



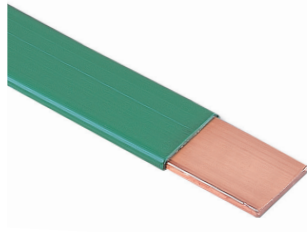
Certification / Standards: ●BS EN 50525 (copper) / ●BS 6746C (PVC colour) / ●BS 6004.

Note: Green & yellow PVC insulated stranded copper cable is supplied unbranded.

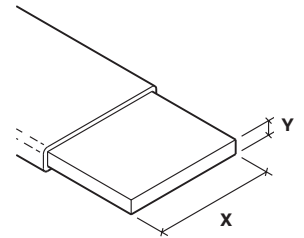
Conductors

LSOH & Lead covered conductors

Green LSOH covered copper tape

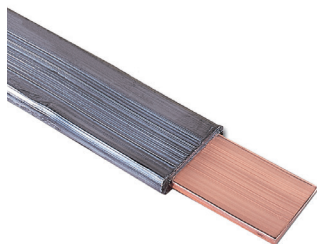


Part no.	ABB order code	Conductor size X & Y (mm)	Standard coil size (m)	Weight per metre (kg)	Certification/standards
TC910	7TCA083020R0107	25 x 3	25	0.77	●●
TC910/50	7TCA083020R0108	25 x 3	50	0.77	●●
TC940	7TCA083020R0113	25 x 6	40	1.53	●●
TC980	7TCA083020R0115	50 x 6	20	2.95	●●

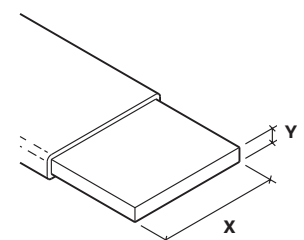


Certification / Standards: ●BS EN 13601 (copper) / ●BS 6746C (LSOH).
 All Green LSOH covered copper tape sold in full coil lengths only.

Lead covered copper tape



Part no.	ABB order code	Conductor size (X x Y) (mm)	Standard coil size (m)	Weight per metre (kg)	Certification/standards
TC330	7TCA083030R0125	25 x 3	25	2.56	●








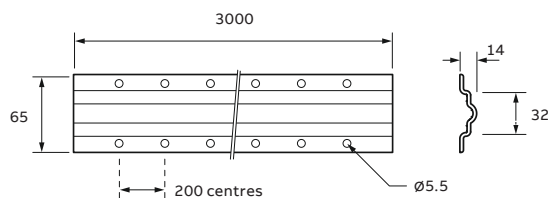
Certification / Standards: ●BS EN 13601 (copper).
 All lead covered copper tape sold in full coil lengths only.

Conductors

Conductor guards

PVC protective down conductor guard

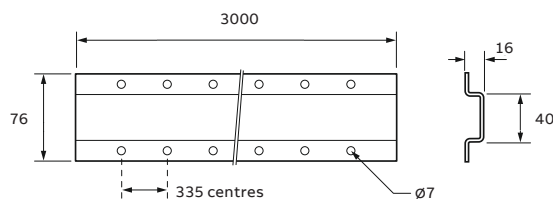
Part no.	ABB order code	Length (mm)	Weight per metre (kg)	Colour range
GC205	7TCA083870R0780	3,000	2.27	Black 
GC215	7TCA083870R0781	3,000	2.27	Grey 
GC220	7TCA083870R0782	3,000	2.27	Stone 
GC225	7TCA083870R0783	3,000	2.27	White 
GC230	7TCA083870R0784	3,000	2.27	Brown 



Protects against vandalism and opportunity theft.
 High impact PVC, UV stabilized to reduce colour degradation.
 Suitable to protect bare and PVC covered 25 x 3 mm flat tape, Ø8 mm solid circular and 50 mm² stranded cable.
 Fix using roundhead wood screws (Part no. SW405) and wall plugs (PS305).
 Note: Conductor guard supplied unbranded.

Anti-vandal down conductor guard

Part no.	ABB order code	Material	Length (mm)	Weight per metre (kg)
AV005	7TCA083870R0018	Galvanised steel	3,000	2.90



Protects against vandalism and opportunity theft.
 Suitable to protect 25 x 3 mm flat tape.
 Fix using No. 10 x 1½" roundhead or security screws and wall plugs.
 Note: Conductor guard supplied unbranded.