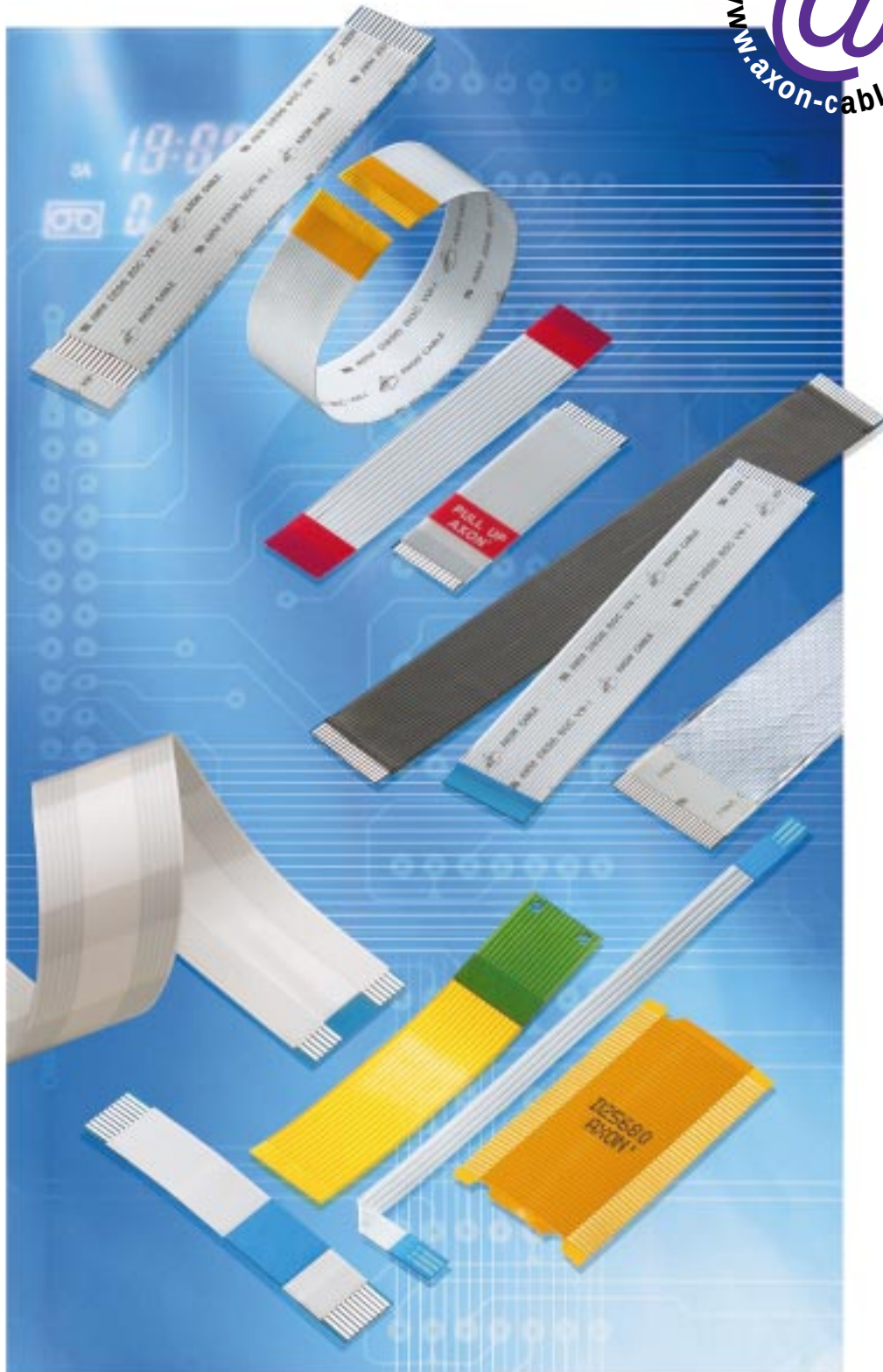


axon'

CABLE & INTERCONNECT



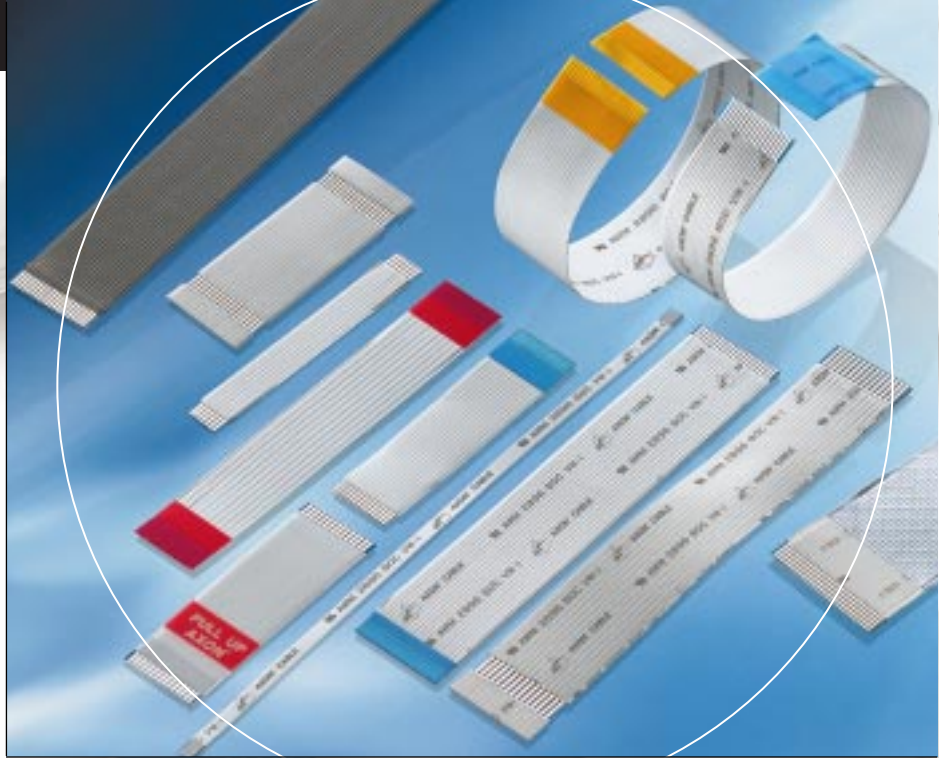
Axojump®

FLAT FLEXIBLE CABLES



AXOJUMP® Flat Flexible Cables consist of flat tin plated copper conductors insulated between Polyester based tapes. Depending on the type of interconnection used, reinforcement tapes can be added to the cable ends to allow for connector compatibility.

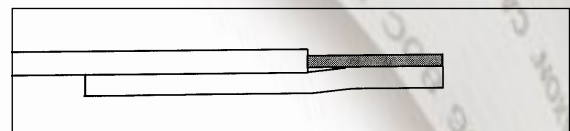
FLAT FLEXIBLE CABLES



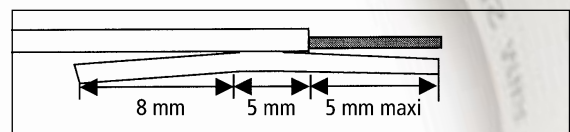
TYPE OF END

DIFFERENT TYPES OF REINFORCEMENT ARE POSSIBLE :

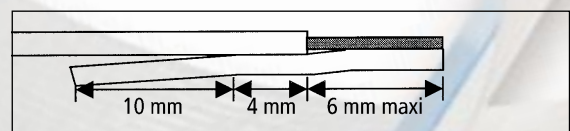
- **Standard Polyester reinforcement tapes** (blue or red) for termination with connectors
- **Standard Polyimide reinforcement tapes** for hot bar soldering
- **"Pull-up" reinforcement** : transparent adhesive tape, marked "AXON' PULL-UP", used to protect the conductors during shipment. This tape is stuck on the insulated part of the cable over a length of max. 5 mm and can easily be removed before soldering.
- **"Easy-to-insert" reinforcement** : Polyester reinforcement tape which is only partially stuck on the cable length to ease handling.
- **Pre-stripping** : a small part of insulation remains in place on the conductor to protect it during transport. The overlapping length of insulation on the conductor is approximately 1 mm. Pre-stripping is only possible with insulation type T.



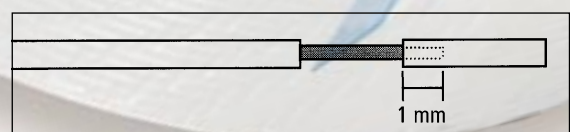
STANDARD VERSION



"PULL-UP" VERSION



"EASY-TO-INSERT" VERSION



PRE-STRIPPED VERSION



GENERAL CHARACTERISTICS (STANDARD PRODUCTS)

PITCH : P	mm	0,50	0,80	1,00	1,25	1,27	2,54
TYPES		A-D		A-B-C-D			
NUMBER OF CONDUCTORS (N)							
TYPES A and D (mini/maxi)		6 to 50	4 to 50	4 to 99	3 to 79	3 to 77	2 to 38
TYPES B and C (mini/maxi)		ON REQUEST		4 to 99	3 to 79	3 to 77	2 to 38
TYPES B and C (mini/maxi), pre-stripping version		13 to 50	8 to 36	6 to 29	5 to 23	5 to 22	2 to 10
CABLE WIDTH : W		(N+1) 0,50	(N+1) 0,80	(N+1) 1,00	(N+1) 1,25	(N+1) 1,27	(N+1) 2,54
MARGIN : M	mm	0,35	0,55	0,65	0,85	0,87	1,75
CONDUCTOR WIDTH : C	mm	0,30	0,50	0,70	0,80	0,80	1,57
STRIP LENGTH : S	mm	2-3-4-5-6-7					
REINFORCEMENT LENGTH : F (*)	mm	6-8-9-10-15-20					
INSULATED LENGTH : L		TYPES A and D = 20 to 1500		TYPES A-B-C-D = 20 to 9999			
TYPES B and C, pre-stripping version	mm	40 to 1500		40 to 9999			
END THICKNESS : T	mm	0,30 +/- 0,05 (for reinforcement type B or R)					
CONDUCTOR THICKNESS							
STANDARD : S (TYPES A, B, C, D)	mm	0,10					0,076
FLEXIBLE : F (TYPES A, B, C, D)	mm	0,05					ON REQUEST
EXTRA-FLEXIBLE : E (TYPES A and D)	mm	ON REQUEST		0,035			
(*) for E and P version, please refer to the corresponding drawing.							
NOTE : for non-standard configurations a design can be provided on request.							

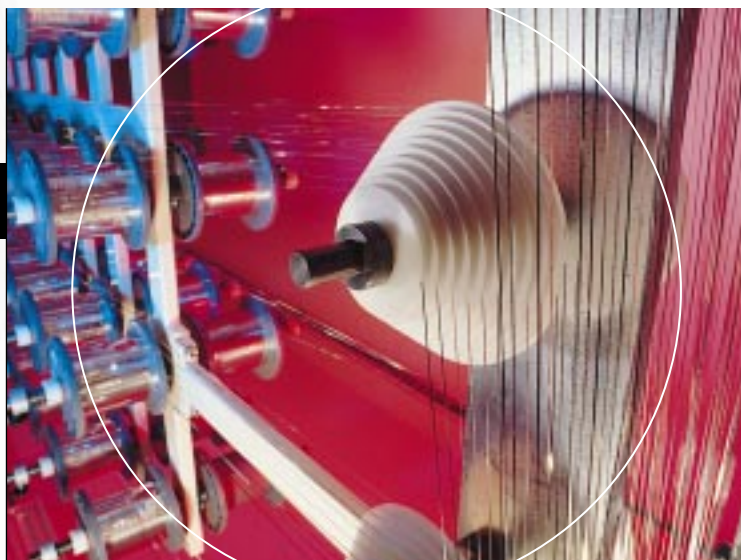


QUALITY : ISO 9001

**QUALITY :
ISO 9001**

AXON' CABLE continues to invest in Quality Assurance. The company is approved to several international standards including ISO 9001 and the quality Department ensures that standards are constantly maintained.

Internationally recognised programmes and methods such as "Statistical Process Control" and TPM (Total Productive Maintenance) are applied throughout our manufacturing area in order to improve productivity. The Axojump® range of cables has obtained the approvals listed hereafter :



UL STYLE	VOLTAGE	TEMPERATURE (*)
UL STYLE 2896	30 V A.C.	80 °C (176 °F)
UL STYLE 2643	300 V A.C.	105 °C (221 °F)
UL STYLE 20566	90 V A.C.	105 °C (221 °F)
UL STYLE 20624	60 V A.C.	80 °C (176 °F)
UL STYLE 20696	30 V A.C.	80 °C (176 °F)
UL STYLE 20706	60 V A.C.	105 °C (221 °F)

* AXON' guarantees the use of its cables for temperatures down to -40°C.



MANUFACTURING



MANUFACTURING

AXOJUMP® Flat Flexible Cable is manufactured by AXON' using the ultimate in high performance mass production technology : AXON' constantly monitors every aspect of production from the wire drawing, tin plating and rolling of conductors through to the application of insulation, final cutting, inspection and packing.



TYPICAL SHAPE OF THE TRANSFER IMPEDANCE

of an AXOJUMP® flat cable.

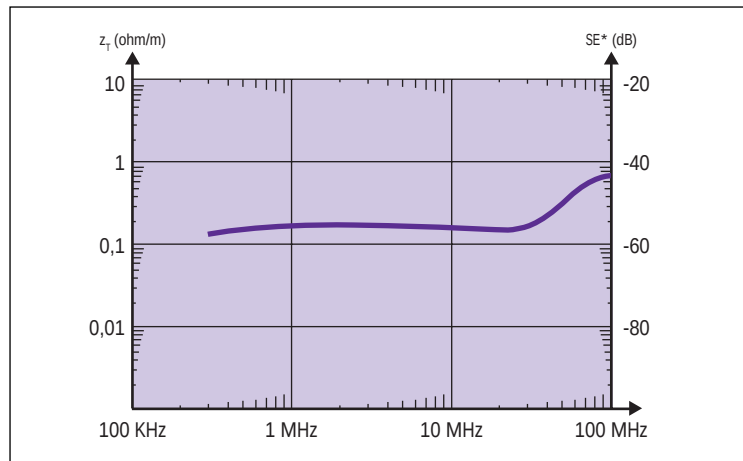


SHIELDING

To characterise the shielding of their flat or round cables AXON' use the parameter of "Transfer Impedance" z_T given in ohms/m. As this notion is dependant on the type of product, rather than on the application, it is better suited than the alternative notion of "Shielding Efficiency", given in dB, for accurately defining shield specifications.

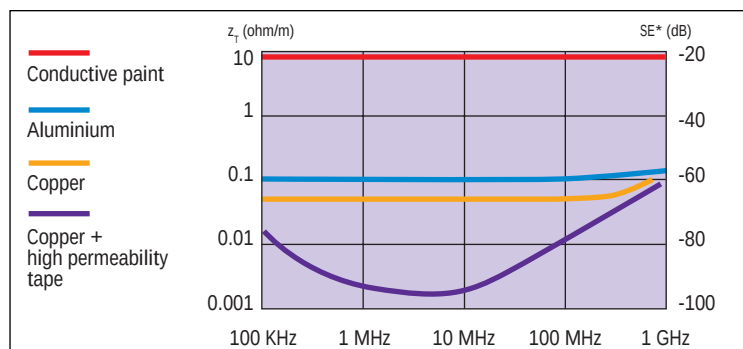
AXON's is equipped with comprehensive test benches to characterise transfer impedance of round and flat cables as well as harnesses. The flat cables are generally measured using a micro strip or strip line .

For the shielding of AXOJUMP® flat cables, the best compromise between good electromagnetic protection, light weight, good flexibility and a reasonable cost has been achieved with 10 μ m Aluminium foils which are wrapped around the flat cable to assure 360° coverage. This shield is grounded to one or several conductors by welding .

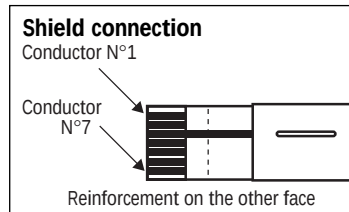


COMPARISON OF THE TRANSFER IMPEDANCE

obtained on flat cables with different shielding materials



* SE = Shielding efficiency : equivalent to a 50 Ω load.



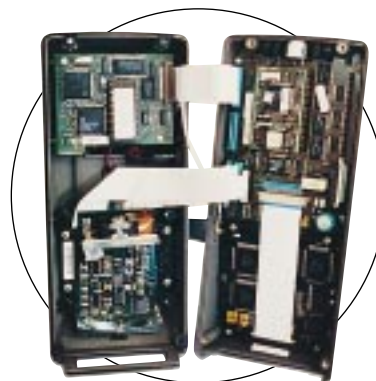
Transfer impedance value	Electromagnetic protection of the flat cable
1 Ω /m	Poor
0.1 Ω /m	Fair
0.01 Ω /m	Good
0.001 Ω /m	Excellent





APPLICATIONS

AXOJUMP® cables are used for board-to-board interconnections in numerous applications including CD players, VCRs, printers, laptop and handheld computers, LCD displays, car radios, TVs, telephones, facsimile machines, hifi equipment, satellite receivers and decoders.



ADVANTAGES

AXOJUMP® offers many advantages :

- **Small dimensions :**
low profile and narrow width design for higher packaging densities ;
- **Low cost / high reliability :**
compatible with ZIF/LIF connectors (Zero/Low Insertion Force) ;
- **Flexlife :** greater flexlife than equivalent PVC products.



AXOJUMP® FLEXLIFE

To respond to the different requirements of flexlife in dynamic applications, AXON' offers a range of FFC to withstand an increasing number of flex cycles.

The following table summarises flex tests which have been carried out on a 1.00 mm pitch FFC sample on a bend radius of 5 mm . The sample was fitted between two plates, the bottom plate and the top plate fixed. Flexing is repeated until one conductor breaks.

TYPE OF FFC	TYPE OF TAPE	MINIMUM NUMBER OF CYCLES (for a 5 mm bend radius)
Shielded versions		Static application
Standard version	K	Static application
Standard version	H	1 000
Standard version	L	6 000
Flexible version	L	30 000
Super-flexible version	S	200 000
Extra-flexible version	E	900 000
Ultra-flexible version	E	Approx. 70 000 000



SPECIAL PRODUCTS

AXON' can also provide special flat cables, in particular :

- folded versions,
- cables with non-standard or hybrid pitches,
- cables with special insulation,
- notched, marked or specially stripped versions.

The AXON' sales team is at your disposal for any special studies and can adapt AXON' products to your production process.





REFERENCE GUIDE

FFC 1.00 A 25 / 0200 K 5.0 - 5.0 - 10.0 - 10.0 S B B B / G 2 - 7

FFC FFC = FLAT FLEXIBLE CABLE

1.00 PITCH = 0,50/0,80/1,00/1,25/1,27/2,54 mm

A TYPE OF STRIPPING

A : Stripped at both ends on 2 sides with reinforcements on the same side.
B : One end : stripped on 2 sides with reinforcement. Other end : stripped on 2 sides without reinforcement.
C : Stripped at both ends on 2 sides without reinforcement.
D : Stripped at both ends on 2 sides with reinforcements on opposite sides.

25 NUMBER OF CONDUCTORS (N)

0200 INSULATED LENGTH in mm = L

K TYPE OF TAPES : see table below

5.0 STRIP LENGTH in mm (S1)-END 1

5.0 STRIP LENGTH in mm (S2)-END 2

10.0 REINFORCEMENT LENGTH in mm (F1)-END 1

10.0 REINFORCEMENT LENGTH in mm (F2)-END 2

S CONDUCTOR THICKNESS :

S (standard) = 0.1 mm/0.004 in (0.076/0.003 in for pitch 2.54) -
F (flexible) = 0.05 mm/0.02 in -
E (extra-flexible) = 0.035 mm/0.001 in (only for 1.00 mm - 1.25 mm - 1.27 mm pitches) -
U (ultra-flexible) = 0,025 mm (only for 1,00 mm - 1,25 mm - 1,27 mm pitches)

B MARKING : A = Not marked - B = Standard marking
(with UL STYLE 2896 or 20624 and AXON' logo) Other marking types on request.

B END 1

B END 2

Type of end : - : without reinforcement - X : pre-stripped - B : blue -
R : red - H : Polyimide - P : pull-up - E : easy to insert.

G TYPE OF SHIELDING :

S : Shielding, not grounded - G : Shielded grounded version (for pitches ≥ 1.00 mm)

2 - 7 Grounded conductor(s) (ex. : conductor 2 and 7 are grounded).



TYPE OF TAPES

RTape ref.	Colour	Standard conductor (S)	Flexible conductor (F)		Extra-flexible conductor (E)	Ultra-flexible conductor (U)	UL style	Types of stripping
			Flexible version	Super-flexible version				
K	white	X					2896	A-B-C-D
L	white	X	X				2896	A-B-C-D
H	white	X	X				2643-20566- 20706-2896 20624 - 20696	A-B-C-D
E	white				X	X	20696-2896-20624	A and D
P	white	X	X				20624 - 2896	A-B-C-D
M	black	X	X				2896	A-B-C-D
N	black				X	X	20696-2896-20624	A and D
S	white			X			2896-20624-20696	A-B-C-D
T*	white	X	X				2896	A-B-C-D

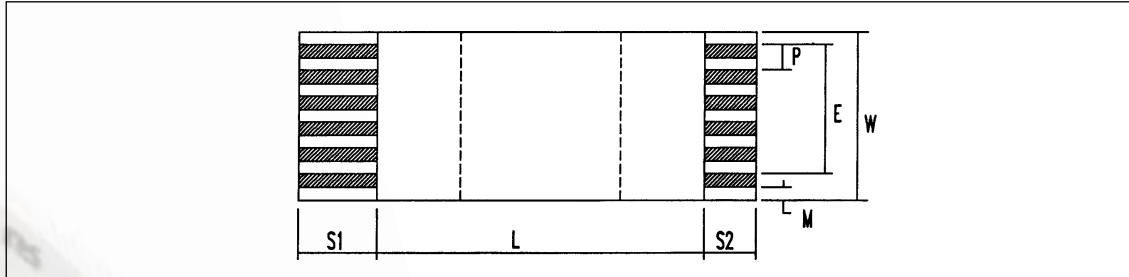
* For prestripped version.





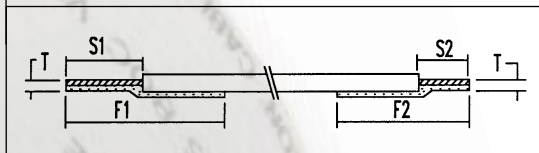
STRIPPING/CONNECTION

GENERAL SCHEMATIC (TYPE A)



TYPE A

2 reinforcements F1 and F2 on the same side



Removable connection (connector/connector) :

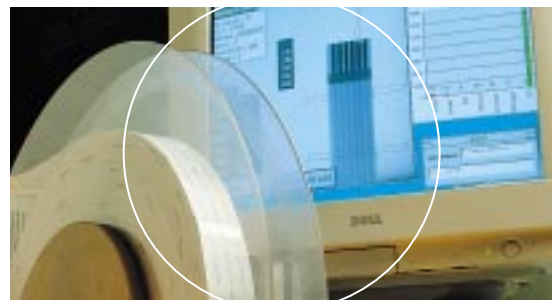
- Use of 2 blue (B), red (R) or “easy-to-insert” (E) reinforcement tapes.

Unremovable connection (solder/solder) :

- Use of 2 Polyimide (H) or “pull-up” (P) reinforcement tapes.

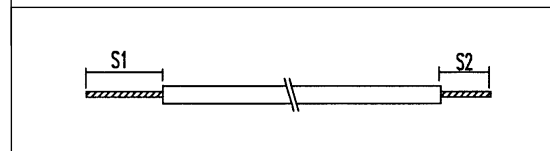
Mixed connection :

- Unremovable at one end (solder) : use of reinforcement tapes type P or H.
- Removable at the other end (connector) : use of reinforcement tapes type B, R or E.



TYPE C

no reinforcement tape

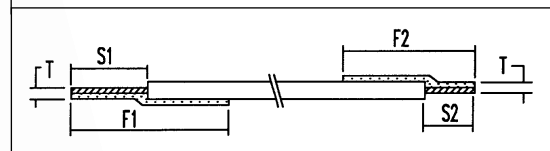


Unremovable connection :

- Stripping (no reinforcement tape) or pre-stripping (type X) at both ends.

TYPE D

2 reinforcement tapes F1 and F2 on opposite sides



Removable connection (connector/connector) :

- Use of two blue (B), red (R) or “easy-to-insert” (E) reinforcement tapes.

Unremovable connection (solder/solder)

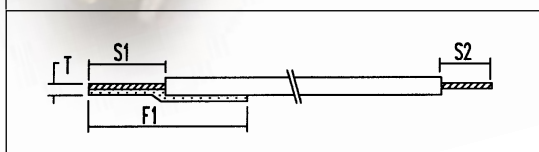
- Use of two Polyimide (H) or “pull-up” (P) reinforcement tapes.

Mixed connection :

- Unremovable at one end (solder) : use of reinforcement tapes type P or H.
- Removable at the other end (connector) : use of reinforcement tapes type B, R or E.

TYPE B

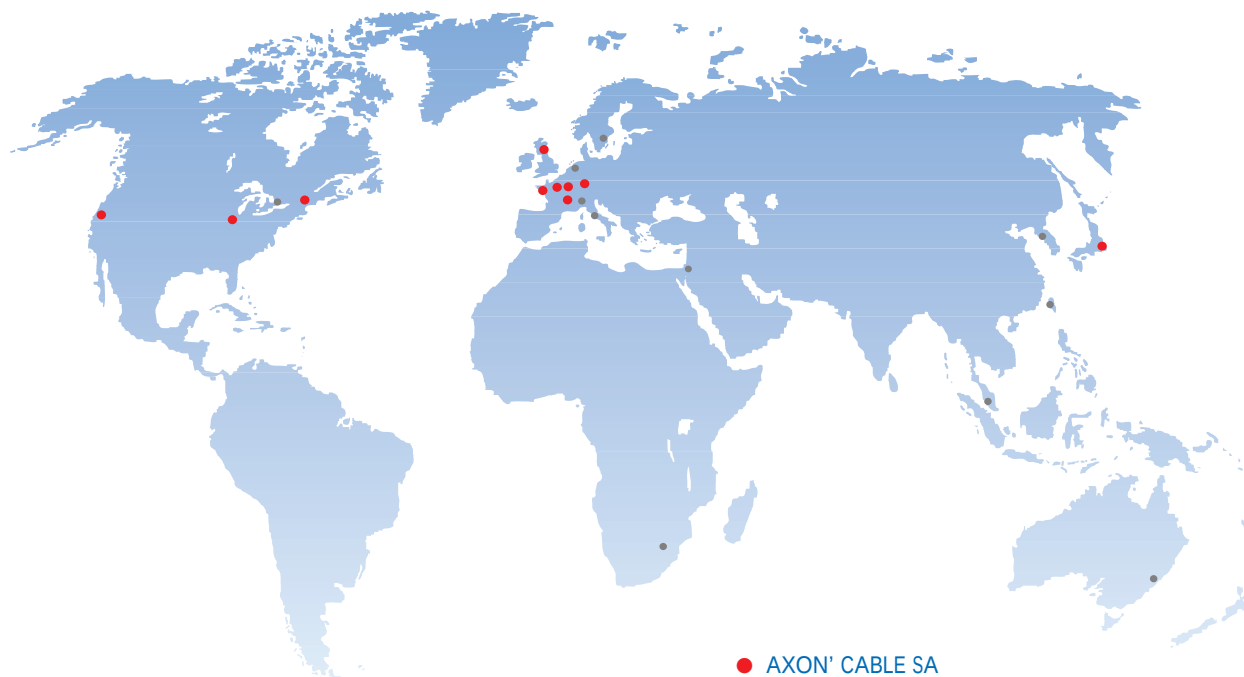
1 reinforcement tape F1 at one end / no reinforcement tape on the other end



Mixed connection :

- Unremovable at one end (solder) : stripping (no reinforcement tape), pre-stripping (type X).
- Removable at the other end (connector) : use of reinforcement tapes type B, R or E.





-  EQUIPMENT WIRES
-  COAXIAL CABLES
-  FLAT CABLES
-  COMPOSITE CABLES
-  HARNESES
-  SPECIAL PRODUCTS

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