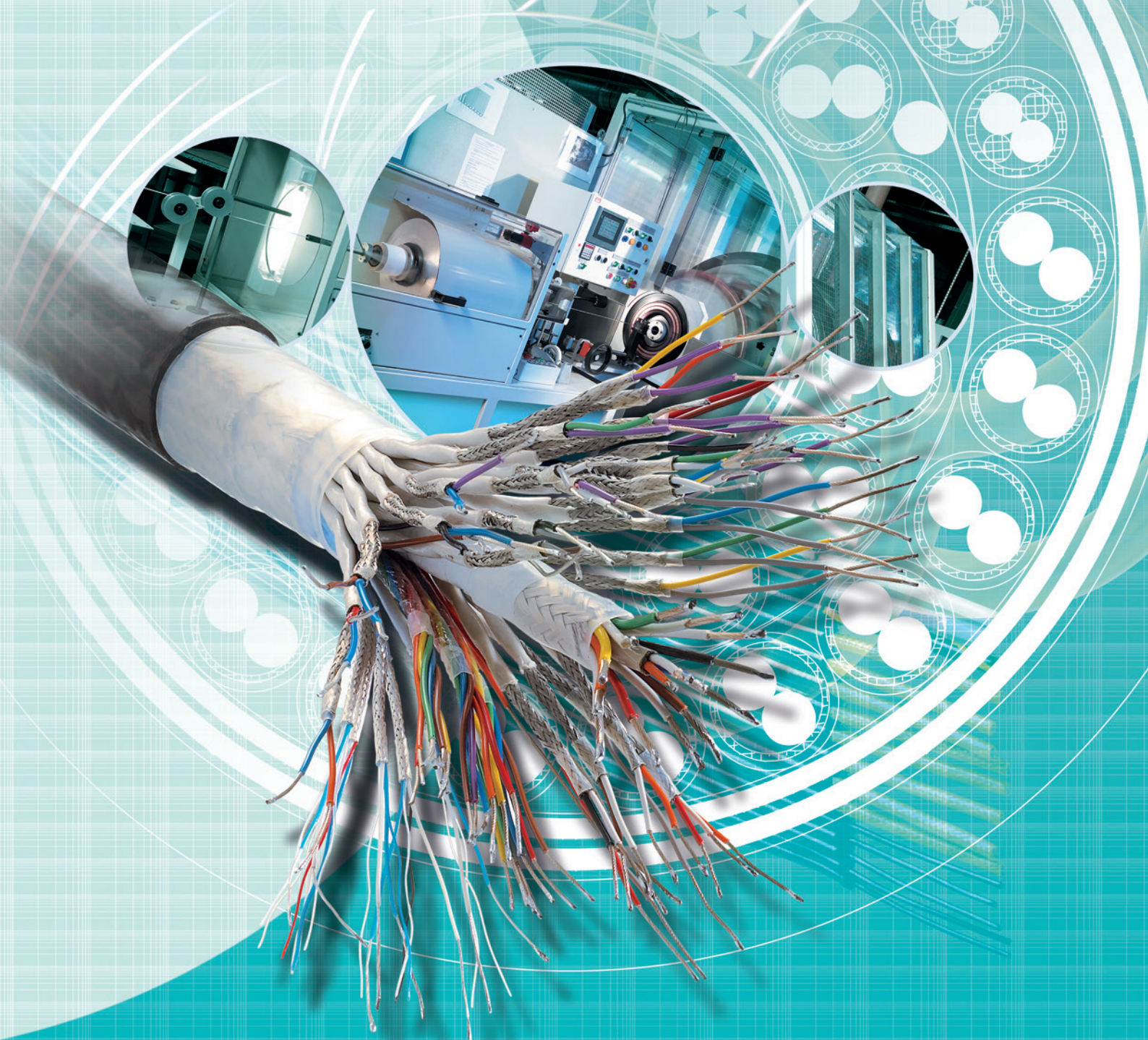


CUSTOM DESIGNED CABLES

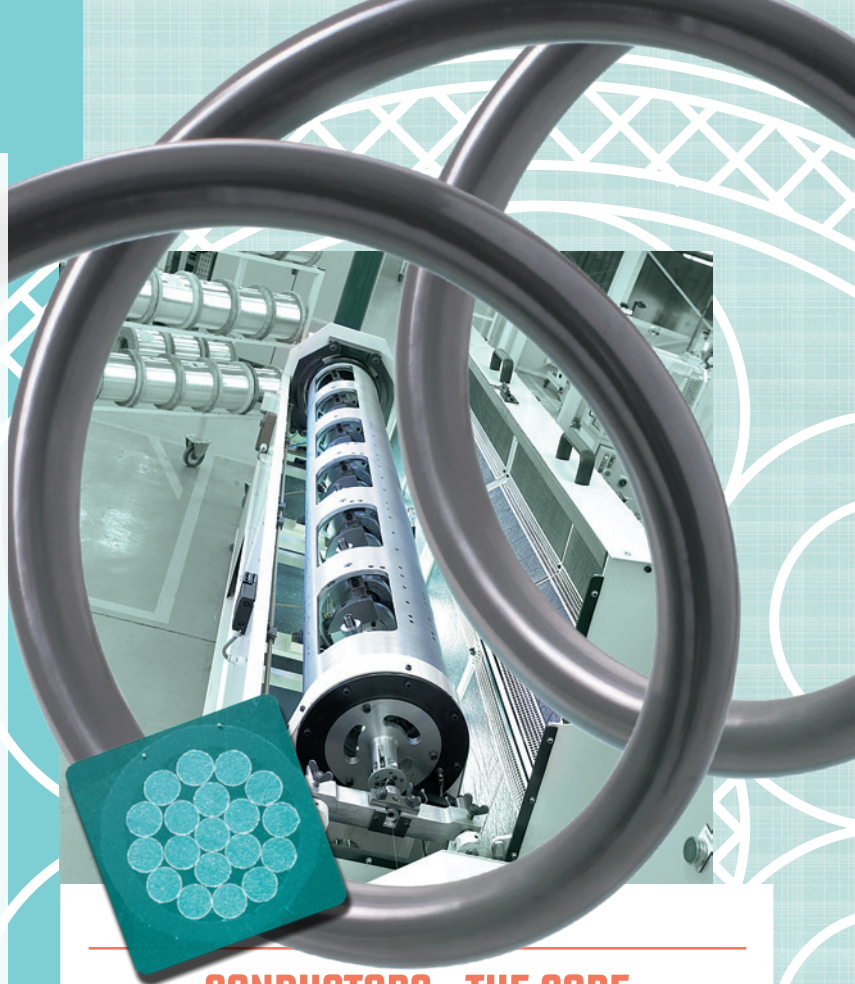
APPLICATIONS : INDUSTRY, AEROMIL,
SPACE, MEDICAL, AUTOMOTIVE,
ENERGY, OIL EXPLORATION, RESEARCH,
ELECTRONICS.



CUSTOM DESIGNED CABLES FROM CONDUCTOR TO COM- POSITE CABLE

When developing a custom designed cable, the mechanical, environmental, electrical and electromagnetic constraints of the application need to be considered.

- Mechanical characteristics : resistance to flexing, torsion, vibration, shock, abrasion, space saving, etc.
- Environmental and climatic characteristics: temperature, humidity, salt spray, resistance to oil and fluids, sterilisation, radiation, fire, etc .
- Electrical and electromagnetic characteristics: frequencies, capacity, losses, resistance, high data rates, power, electromagnetic compatibility, etc.



CONDUCTORS : THE CORE OF COMPOSITE CABLES

Expertise in different techniques : silver plating, tin plating, drawing and assembling.

The diameter and composition of the basic strand has a determining role when choosing the right conductor to ensure signal transmission and EMI protection (shielding). By manufacturing conductors at AXON', the company is able to offer a wide range of single-stranded or multi-stranded precision conductors made with bare copper, silver plated copper, tin plated copper, nickel plated copper, silver plated aluminium and special copper alloys which meet the most stringent requirements especially in flex and torsion

	Plating	Single strand conductor (AWG)	Multi strand conductor (AWG)
Copper C1 (OF)	Bare Copper/ Silver	20 to 48	00 to 40
Copper A1 ETP	Bare Copper/Tin Silver, Nickel	20 to 40	00 to 30
Copper alloy	Silver	20 to 58	04 to 50
Aluminium	Silver	26 to 40	06 to 28

Axon' also manufactures flat conductors (copper or tin plated copper).



INSULATION

Expertise in thermoplastic extrusion, PTFE extrusion and taping.

Design and manufacture of insulated wires with materials including :

- Fluorinated materials (FEP, ETFE, PFA), PEEK, polyimide, etc.
- Fluoropolymers including PTFE and alveolar PTFE designed to optimize electrical characteristics of data transmission cables.
- A patented product: CELLOFLON® (expanded PTFE) with a low dielectric constant (1.35) for dielectrics to optimise electrical characteristics of coaxial cables.
- Special materials and compounds developed by our plastics specialists.
- Irradiated insulation (X-ETFE).
- Polyimide insulating materials for nuclear or high temperature applications.
- Thin insulation with a possible covering of 3/100 mm.
- Insulating materials and components able to resist sterilisation for medical applications (PVC, silicone, polyurethane, etc).
- VITAX™ composite cables insulated with fluorinated elastomers for chemical and aggressive environments, including high temperatures (+ 230°C) and abrasion.
- Flexible power cables resistant to oils.
- Halogen free insulating materials.
- VIBRAFLAME® insulated composite cables able to withstand extreme temperatures (-196°C/+1565°C).
- Precision taping: a wide range of tapes made with polyimide, PTFE, CELLOFLON®, polyimide, etc.



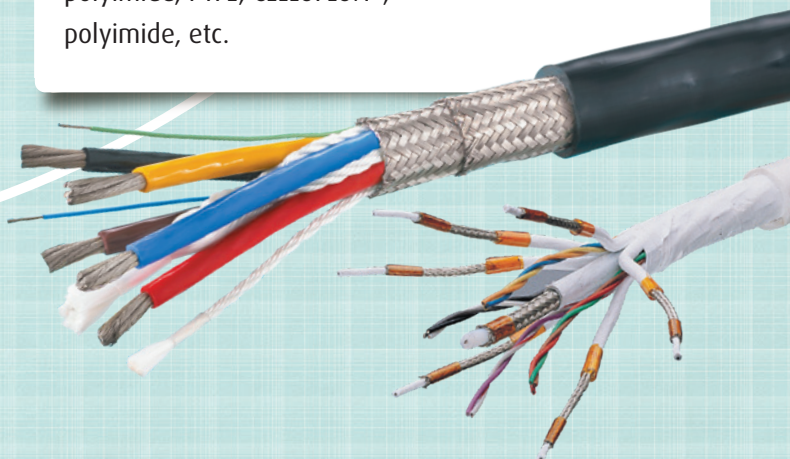
PROTECTION AGAINST ELECTROMAGNETIC INTERFERENCE

Any electronic system can disturb its close environment by creating electromagnetic interference or can be influenced by radiation. Efficient shielding of wires, cables and harnesses is then required.

- Expertise in helicoidal shielding, with braid, tapes (copper, SPC, aluminium, etc).
- Alloy or nickel plated conductors (depending on the temperature).
- Silver plated aluminium or stainless shielding.
- Optimisation of bundles, diameters of shielding strands, braiding angles for mechanical or electromagnetic protection.
- Synthetic fibre, glass fibre for mechanical protection.
- Braiding of round and flat cables.
- Overbraiding of branches with a continuous shielding.

Optimised tools :

- Define EMC value from the design.
- Study of shielding configuration of the cable.
- Control of transfer impedance after manufacture : triaxial, micro-strip, methods, mode stirred chamber (measurements up to 18 GHz).
- Different shielding solutions: lower transfer impedance for a more efficient shielding.





ASSEMBLY OF HYBRID ELEMENTS

Different configurations of cables made with twisted pairs, shielded versions, flexible wires, power cables, coaxial cables, microwave cables, tubes, etc, suited for applications requiring flexibility, space saving, etc.

- Optimisation of twisting, constitution of different layers dependent on the application.
- Assembly of electrical hybrid or optic-electrical cables.
- Flat hybrid cables made with round or flat wires, PTFE tubes and jacketed with insulating materials including ETFE, FEP, PU, silicone, etc. for applications requiring space saving, good resistance to flexing or good heat dissipation.
- Spiral cables characterised by memory and extension coefficient suited for the application : medical devices, measurement devices, robots, etc.
- Shaped cables (profiles), etc.

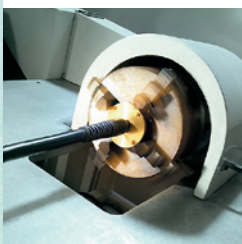


TESTS PASSED !

Axon' uses a wide variety of equipment to ensure that cables meet the most severe requirements :

Environmental and physical constraints

- Climatic chambers for different tests: heat shock, ageing, humid heat, cold, salt spray, etc.
- Meniscograph (IEC 68-2-69) to check solderability of cables and components.
- Differential Calorimeter Analysis (DSC) : measurement of heat flux under temperature variations (fusion point, crystallisation).
- Electronic scanning microscope.
- X ray tests.
- Non-magnetic tests (connectors).
- Hermeticity tests (connectors)



Mechanical constraints

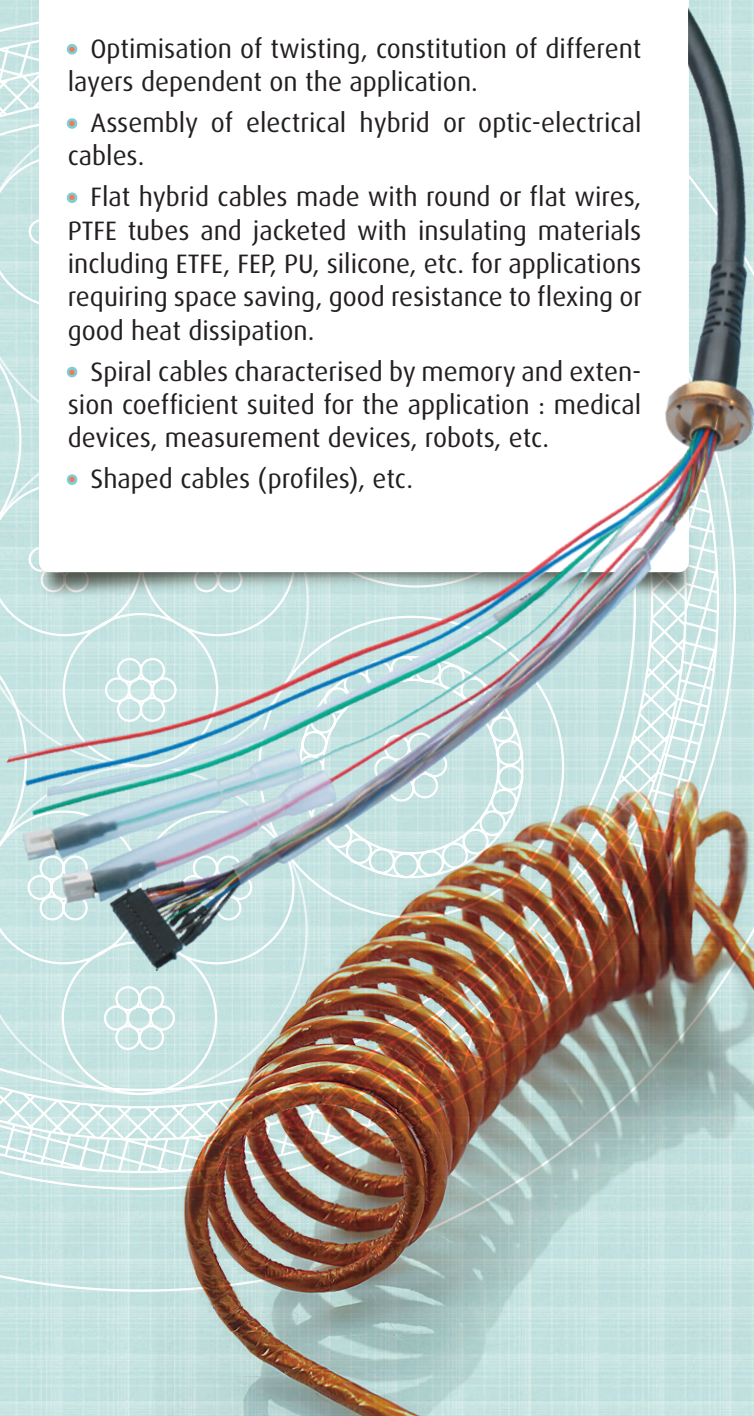
- Combined flex/torsion, folding, winding, unwinding.
- Vibration equipment, combined vibration/climatic tests

Chemical constraints

Resistance to oils, solvents and sterilisation.

Electrical constraints

Test benches (continuity, tensile strength, eye pattern, etc), benches to test shielding efficiency, Partial Discharge tester for High Voltage testing.



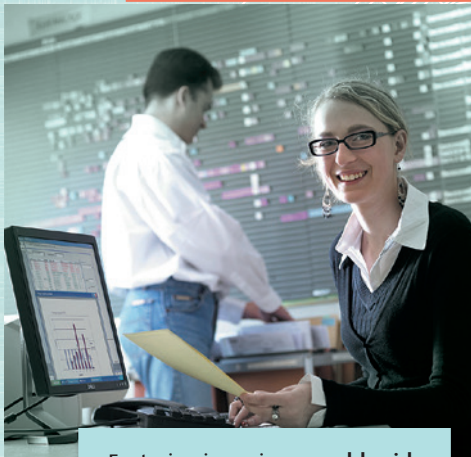
EXPERTISE

Axon' cable has been a manufacturer of wires, cables and interconnect solutions for advanced technologies for almost 50 years. During this time the company has gathered significant expertise in the design and manufacture of composite cables for the most demanding of applications.

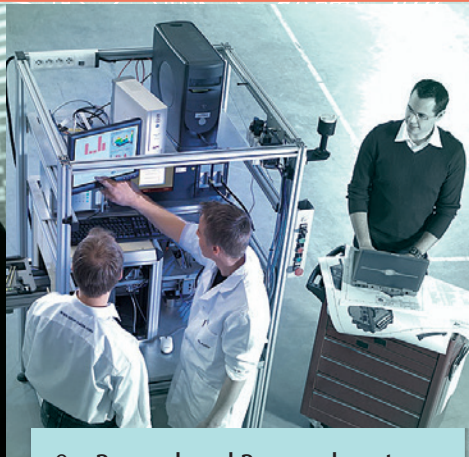
Applications :
industry, aeromil, space, medical, automotive, energy, oil exploration, research, nuclear or electronics.

Our **Research and Design** departments which are supported by our **Research and Development** departments specializing in metallurgy, plastics, microwave, electromagnetic compatibility, micro-mechanics, high data rate, etc will give you the best possible support.

HIGH PERFORMANCE EQUIPMENT



Factories in various **world-wide locations** for better service to local markets.



Our **Research and Process department design** and continuously improve our manufacturing equipment to increase the reliability of the manufacturing process and ability to adapt to market requirements.



Clean rooms for space and medical applications.
Manufacturing capability for small, medium and large volume applications



QUALITY ASSURANCE

AXON' has committed oneself to improving its quality process and has the following approvals :

ISO 9001

ISO 14001

EN9100

ISO/TS16949

ISO 13485

OHSAS18001



The Axon' factory in Montmirail, France



axon-cable.com

CONTACT US

>> BRAZIL

Axon' Cable Ind.e Comércio LTDA
Rio de Janeiro
+55 21 3596-8002
salesbrazil@axon-cable.com

>> CANADA

AXON' CABLE CANADIAN OFFICE
MONTREAL, QUEBEC
+1 514 898 2044
sales@axoncable.com

>> CHINA

AXON' INTERCONNECT LTD
SHUNDE, GUANGDONG
+86 757 2838 7200
sales@axon-interconnect.com

>> GERMANY

AXON' KABEL GmbH
LEONBERG
+49 7152-97992-0
sales@axon-cable.de

>> HUNGARY

AXON' KÁBELGYÁRTÓ KFT.
KECSKEMÉT
+36 76 508 195
axon@axon-cable.hu

>> INDIA

**Axon' Interconnectors
& Wires Pvt Ltd**
Bangalore
+91 (0) 806 816 2966
sales@axon-cable.in

DHRUV: your Indian offset partner
Dhruv Axon' Interconnect Private LTD
Bangalore

>> JAPAN

AXON' CABLE JAPAN OFFICE
Nagano
+81 26 217 6728
axon-japan@axon-cable.com

>> LATVIA

AXON' CABLE SIA
DAUGAVPILS
+371 6540 78 91
axon@axoncable.lv

>> MEXICO

AXON' INTERCONEX, S.A. de C.V.
Querétaro
+52 442 215 2713
axon-mexico@axoncable.com.mx

>> SINGAPORE

AXON' CONNECT PTE LTD
Singapore
+65 6250 3169
sales.singapore@axon-cable.com

>> SPAIN

AXON' CABLE SPANISH OFFICE
MADRID
+34 911 309 123
sales@axon-cable.com

>> UNITED KINGDOM

AXON' CABLE Ltd
DUNFERMLINE
+44 1383 421500
sales@axon-cable.co.uk

>> USA

AXON' CABLE INC.
SCHAUMBURG
+1 847 230 7800
sales@axoncable.com

HEADQUARTERS

AXON' CABLE S.A.S.
2 RTE DE CHALONS-EN-CHAMPAGNE
51210 MONTMIRAIL - FRANCE
+33 3 26 81 70 00
sales@axon-cable.com

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