Axon’ Cable has developed and manufactured cables and interconnect systems for high tech electronics for over 50 years. The product range is very large: equipment wires, composite cables, cable assemblies, mini-systems and miniature connectors. Axon’ Cable offers custom designed innovative solutions to markets including automotive, avionics, defence, space, oil research, scientific research, medical, industry, etc.

Since its creation in 1965, Axon’ has based its development on 3 trends: miniaturization, protection against electromagnetic interference and reduction in the number of suppliers. Axon’ has enlarged its range of products from simple equipment wires to the design and manufacture of complete mini-systems. Its production tool enables the group to offer small series to high volumes.
Innovation is in our DNA

Innovation is one of the main priorities of the group which invests 10% of its turnover in Research & Development. Over 200 technicians and engineers are specialized in:

- Metallurgy: manufacture of precision conductors
- Plastic technologies: jacketing, moulding, overmoulding

Cross-over from our space technologies towards those of medical or automotive enables Axon’ to offer innovations to customers and a rapid development. This is what we call open innovation.

European roots, international presence

Since its creation, Axon’ has kept on growing. In 1965, the company employed 5 staff. Over 50 years after, Axon’ is a medium-sized company with over 2200 people and 18 subsidiaries worldwide. Today, over 70% of the turnover is achieved at export.

More expertise

The Axon’ group also enjoys expertise in elastomeric components with Addix. It is specialized in rubber processing and the manufacture of connector insulators.

Axon’ Mechatronics in Quimper, offers interconnect solutions including cut parts, moulded and overmoulded components as well as mechatronic components.

Axon’ Pintec, formerly known as CISAL, designs and manufactures male wire pins and interconnect pin headers for automotive and industrial applications.

With Domocare, the group offers E-health solutions.

Axon’ Nanotec formerly known as ISA France joined the group on 1st January 2017. The company has been renamed. Its original core business in the design and manufacture of miniature watch parts makes the company an expert in cutting, injection and assembling micro and nano-technologies. This expertise in micro-technologies is particularly interesting for Axon’ as miniaturization is a key requirement of the markets including Avionics and space that Axon’ targets. Axon’ Nanotec is located in Villers-le-Lac close to the Swiss border.

1965 - Montmirail, France
1985 (1971) - Stuttgart, Germany
1988 - Edinburgh, UK
1989 - Chicago, USA
2000 - Daugavpils, Latvia
2000 - Kecskemét, Hungary
2000/2004 - Shunde, China
2003 - Madrid, Spain
2006 - Mexico, Mexico
2008/2010/2019 - Bangalore, India
2013 - Rio de Janeiro, Brasil
2015 - Quebec, Canada
2016 - Wissembourg, France
2017 - Villers-Le-Lac, France
2017/ 2018 - Singapore
THE AXON’ GROUP

A perennial vision

“We want to build a perennial company”. This extract from the company policy illustrates both history and vision of Axon’. Our SOLON plan reflects this long-term strategy. Joseph Puzo, the current President and CEO has been at the head of the family company since 1985. Mrs Christelle Olivié, Mr Puzo’s oldest daughter, has been Managing Director since 2007.

THE GROWTH OF AXON’
Consolidated turnover in € M

PRESS CONTACT
Sandrine HERMANT
TEL +33 3 26 81 71 41
sa.hermant@axon-cable.com
PHOTOS : ANAIS STUDIO/AXON’
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Axon’ faces technological challenges

AXON’ faces technological challenges

The size of electronic devices has been decreasing for several years, while multiplying their functions in a limited space. Components including cables, cable assemblies and connectors have to meet these requirements. For example, the first flat flexible cables designed for board-to-board connection was offered with a 2.54 mm pitch. Axon’ can supply these products with 0.30 mm pitch. The trend towards miniaturization concerns all markets including avionics and defence. Axon’ also offers miniature Micro-D connectors with 1.27 mm pitch and Nano-D connectors with 0.635 mm pitch. They are respectively twice and 4 times smaller than D-Sub connectors. These requirements also influence the choice of materials of the cables. Axon’ manufactures conductors which are twice to 4 times smaller than a hair. Wires and cables must be flexible in order to place them in a limited space.

Axon’ Cable has been developing miniature connectors equipped with user-friendly locking systems which gives greater flexibility to customers. It makes the connection easier in systems where the access is difficult. Connectors with removable contacts and dismountable versions make also the integration with customer equipment much easier.

Protecting onboard electronics from electromagnetic interference (EMI) is essential in aircrafts and satellites but also in medical devices. Any electronic system can both disturb and be disturbed by the creation of EMI.

Axon’ s success for over 50 years can be explained by its capacity to design and manufacture innovative links and electrical interconnects for severe environments. Axon’ faces many technological challenges for various applications including automotive, avionics, defence, space, medical, industry, scientific or oil research.

Miniaturisation & weight saving

Ultra-fast connection and easy integration

Customers want not only space-saving but also time-saving interconnect solutions.
Resistance to environmental constraints

From the infinitely small to the infinitely big, the constraints related to extreme environments are various: radiation resistance in space or in particle accelerators, extreme temperatures in oil research or steel industry, resistance to vibrations and shocks in defence or oil and gas industries. Closer to our everyday’s life, sterilization and biocompatibility for medical, weight saving and flexlife for automotive industry.

In order to meet these requirements, Axon’ selects materials designed to ensure reliable and resistant interconnects. The company is also involved in the risk management linked to dangerous substances (Reach, RoHS).

Poor electromagnetic protection of a device can also have serious consequences not only upon communication and navigation systems but also upon electrical cables and interconnect which are often the first systems being affected by EMI. From the design of the cable or the whole interconnect, Axon’s engineers intervene with their own simulation software.

Simulation & modelling for time saving

Time to market is all important. When designs are complex with challenging requirements in terms of available space and performance a lot of time can be lost through the iterative process of trial and error. Axon’ engineers use simulation and modelling tools: capacitance and impedance simulation for coaxial cables, microwave simulation, circuit modeling to ensure network topologies are correctly configured, mould flow analysis, cable flex-life modeling in order to optimize cable materials and construction prior to any manufacture or test.

A large expertise

The technological expertise of Axon’ speaks for itself. For example, the company has equipped Ariane 5 with data bus transmission harnesses, real nervous system of the launcher since 1990s. Many satellites, the International Space Station (ISS) as well as aircrafts including A400M, A350, Rafale and helicopters including Eurocopter are mounted with Axon’ interconnects. Axon’ is already involved in several Martian missions including Mangalyaan and Maven Mars Orbiter missions as well as Curiosity Rover.

The company has been selected to provide cabling and harnessing for ExoMars Rover Vehicle. One of the four detectors of the LHC, the most powerful particle accelerator in the world, is equipped with cable assemblies and connectors designed by Axon’ engineers. They are also involved in ITER, an international nuclear fusion research and engineering project.

The medical market is also essential. Axon’ interconnects are mounted into medical devices used in operating theatres, for diagnostics or patient care. The Human body is an “environment“ with special constraints for which Axon’ can deliver implantable cable assemblies. Moreover, Axon’ Cable has been chosen to contribute to Neurofibres, an European research project which could help paraplegics to recover the use of their limbs.

The automotive market is also a target for Axon’. The company supplies Airbag cables to worldwide companies including Porsche, BMW, Nissan and General Motors.
over
50 years of
INNOVATION

« We want to build a perennial company »

This quote illustrates Axon’ general strategy for over 50 years. Axon’ has diversified its expertise by offering mini-systems and interconnect solutions while developing its core businesses.

1965-1980
CABLE MANUFACTURE WITH HIGH TECH PLASTICS (PTFE, FEP, PFA, ETFE)

1965  Creation of the company as a French branch of a Swedish company.
1980  Sales of the subsidiary to a holding company which is under the control of Volvo.

1980-1990
CABLEING AND CABLE ASSEMBLIES

Axon’ enlarges its range of products by offering cable assemblies with connectors, silver plated flat conductors, Celloflon® (porous PTFE) and Vibraflame® (cables resistant to extreme temperatures) patented in 1983. Research and design of cable solutions against electromagnetic interference.

1981  Creation of the Research & Development Department.
1985  Birth of Axon’ Cable. LMBO carried out by Mr. Puzo, the main managers of the company and some financial organizations: Axon’ Cable is born.

1989-1995
Creation of 4 export subsidiaries in Germany, Scotland, USA and Japan.

1990-2000
SPACE AND MEDICAL INNOVATIONS

Bus network wiring for Ariane 5, flat harnesses, Picocoax® coaxial miniature cables, aluminium conductors for satellite cabling.

Creation of factories dedicated to the manufacture of flat flexible cables, cut and stripped parts, cable assemblies for the telecommunication market.

1994  Acquisition of Addix, a manufacturer of elastomer products.
1996  Acquisition of Loupot, a company specialized in the manufacture of interconnect solutions and mechatronics components. The company changes its name to Axon’ Mechatronics in 2015.

VIBRAFLAME® CABLE
RESISTANT TO 1000°C

« We want to build a perennial company »

This quote illustrates Axon’ general strategy for over 50 years. Axon’ has diversified its expertise by offering mini-systems and interconnect solutions while developing its core businesses.
1997  Sofim, specialized in company networking and coaxial connectors joins the group. Investment in an extruder for large diameter PTFE cables.

From 2000
MINIATURE CONNECTORS
Micro-D and Nano-D interconnect solutions, design and manufacture of connectors.

2000-2004  Creation of 3 factories and a sales office.
• AXON’ KÁBELGYÁRTÓ Kft in Kecskeméth in Hungary.
• AXON’ CABLE SIA in Daugavpils in Latvia.
• AXON’ Spanish Office in Madrid in Spain.
• AXON’ Interconnect Ltd in Shunde in China.

2006  Opening of a new manufacturing site in Querétaro in Mexico.

2008  Opening of a new office in India.

2010  Opening of Axon’ Interconnectors and Wires in India.

2011  Sofim enlarges its range of products and is called Domocare. Opening of a new factory in Montmirail.

2013  Creation of the Brazilian subsidiary in Rio de Janeiro. Axon’ Kabel GmbH in Germany invests and moves to new premises.

2015  Axon’ celebrates its 50th anniversary through several events: customer seminars, international Open House in all the factories.
• Inauguration of a brand new factory in Kecskeméth in Hungary.
• In order to be a long-standing company, Axon’ launches the Axon’ 4.0 project which aims at shaping its industry of the future.
• Opening of a new factory in Shunde in China.

2016  Takeover of CISAL, a company specialized in the manufacture of interconnect components. CISAL is renamed Axon’ Pintec.

2017
EXPERT IN MICRO-TECHNOLOGIES
• Takeover of ISA France, a company specialized in Micro-technology. ISA France is renamed AXON’ Nanotec.
• Opening of a new office in Singapore.

2018
• Opening of a subsidiary in Singapore.

2019
• Inauguration of a brand new factory in Bangalore, India.

PRESS CONTACT
Sandrine HERMANT
TEL +33 3 26 81 71 41
sa.hermant@axon-cable.com
PHOTOS : NICKELKROME, FRED LAURES, AXON’ INDIA
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CSR
AXON’ is involved

Engaged with employees

Axon’ Cable is the first French company and one of the first in the world to be ISO45001 certified. This certification illustrates the Axon’ committed policy in term of Corporate Social Responsibility. With its security policy, Axon’ is committed to preventing accidents and improving working conditions for Axon’ employees. Integrate new «Axonians» is essential. In Montmirail, Axon’ can provide very low cost rental housing for trainees and employees with fixed term contracts.

Axon’ has created a Fab Lab equipped with 3D printers and opened to Axon’ staff and their relatives. Exchange and sharing are at the heart of the Fab Lab.

In 2015, the Mexican subsidiary Axon’ Interconex launches, Axionâte, a 15-week programme which aims at improving the quality of life of employees. They are encouraged to practice sport, drink, eat healthy and have more exchanges.

Since the end of 2015, AXIONATE has also been proposed to the staff in Montmirail who could take part to table football and pétanque tournaments or test different activities including yoga, piloxing and walking.

Foster the orientation

Factory visits, projects with schools, recruitment forums, many actions have been led to introduce Axon’ and its different jobs to young people for 20 years. This is also the objective of the “Classes 4.0” work, week organized with local schools in Sezanne and Montmirail.

Objective: prove to about 60 pupils aged 14 that they can deal with technologies of the Industry of the Future and understand the importance of cybersecurity for a company, like axon’. Developing Projects with university graduate students gives us an external perspective on a problem, new ideas and also helps us integrate innovative technologies in our applications.
This highly energy efficient new manufacturing site has been awarded the coveted A+ class building certification. At the end of October 2013, the German 26-staff team moved to new and sustainable premises. In 2011, Axon’ increased its production capabilities with a new 3000 m² eco-friendly building with green roofing in Montmirail. The same year, the Axon’ Latvian subsidiary launched a project of building insulation and energy consumption monitoring of its factory in Daugavpils. In 1993, the company renovated a former dairy farm and transformed it into a research and Production centre next to the French headquarters. In 1996, the company set up a factory by renovating a cloister next to a 12th century abbey in Orbais l’Abbaye.

Art & associations support
As a corporate citizen, Axon’ is committed to supporting local associations which organize sport or historical events.

Sustainable Development
Axon’ has defined its environmental and energy policy in order to limit its environmental impact: management of waste production, communication campaign about environmental-friendly behaviour. Axon’ has started to invest in building renovation and eco-construction for many years. The brand new Indian subsidiary is a low consumption building. The company built a new factory in Hungary in 2015.

Moreover, art patronage is closely linked to Axon’ history. The company aims at promoting contemporary artists. “Between the creative work of the artist and our efforts for innovation, we find a similarity in the approach, which explains without doubt that exhibitions of works of art are naturally integrated in our industrial events”. This statement made by Axon’s President and CEO Mr Joseph Puzo illustrates the commitment of the company towards artists. Opening of new factories, new halls, open days, customer symposiums or company anniversaries are good opportunities for Axon’ to exhibit art pieces and support young artists. Painting, sculptures, ceramics, engraving, photos, and art pieces made with cables or industrial parts find their place in the manufacturing halls in France and abroad. Axon’ has obtained several prestigious awards for its actions as a patron.
AXON’ ACCELERATES

Modernizing industry and transforming companies with digital technology: these are the objectives of today’s industrialized countries. In order to be a perennial company, Axon’ has already started its industrial transformation: this is the Axon’ 4.0 project.

More simulation : design and engineering

Axon’ is already equipped with different tools. But this trend will continue to grow. Multiphysics simulation software, EMC modeling for cables and harnesses, microwave simulation, analysis of mold flows to design molds, flex life simulation of cables, 3D routing software. The objective of this kind of software is clear: simulate for a better design and swiftly offer the actual product to the customer.

More Data, faster

In order to modernize its industrial capability, Axon’ has an important asset in its Research & Process (R&P) team. These experts, specialized in the design of machines and production lines, have developed automation processes for several years. But they do much more !

As the factory of the future will be fully connected, the challenge is to link sensors, displays, regulators, components and machines to make them communicate with one another and store data through OPC servers (OLE for Process Control). This is Big Data: it consists of measuring, collecting and storing data in order to analyze and improve production. Remote monitoring is used by R&P engineers based in France to have access to machines which are located in the Hungarian subsidiary, for example.

To an all-digital solution

As products made by Axon’ are more and more complex, the documentation used during production tends to get heavier. One solution: digitizing the manufacturing file so that each operator can access directly and quickly the information he or she needs. The objective is to limit mistakes, improve production flows and reduce delivery times. By 2020, the objective is to have installed in all the workshops displays showing the manufacturing batches to produce and the operators will use tablets to access documents in a few clicks.
More additive manufacturing

What will the future aircraft factory look like? This is the question specialists from about 20 French companies including Axon’ Cable are thinking about. Axon’ works on the use of new production technologies such as the integration of additive manufacturing (3D printers) in the industrial process. The company has created a workshop dedicated to additive manufacturing. This technology is used to design and manufacture prototypes and production tools. But the objective is to use it on an industrial scale.

To new jobs

In order to use collaborative robots (cobots) and digital tools, the staff will have to acquire new skills. Axon’ has contributed to the training of future generations through various projects with pupils and students for many years: research projects with graduate students, digital communication, and so on. As staff training is an ongoing priority, Axon’ invests 10% of the payroll into training initiatives every year. The company has opened a Fab Lab Café© for all Axon’ staff and their relatives: 3D printers, Arduino kits (micro-processor), and computers are available. Everything to boost creativity and experience new technologies!

INDUSTRY OF THE FUTURE

Most developed countries have launched a program to modernize their national industries via the digital technology. In the USA, it is called “Smart Leadership Coalition”, in China “Made in China 2025”, in Germany “Industrie 4.0” and in France “Industrie du futur”. All have the same objectives: be more competitive and create jobs. At Axon’, the project to modernize our production tool is called Axon’ 4.0. This refers to Industry 4.0 and to the 4 industrial revolutions which shaped companies.