

The background of the entire page is a blue-tinted image of a space station or satellite in orbit. Overlaid on this are several white and yellow circuit-like lines that start from the left edge and branch out towards the center and bottom of the page. The main title is positioned in the middle-right area, with a yellow underline beneath it.

Harness expertise & quality assurance

www.axon-cable.com

axon'
cable & interconnect

The Axon logo consists of a stylized diamond shape with a blue-to-white gradient, containing the word 'axon' in a small, lowercase font.

Harness expertise

With more than 20 years of experience in harness design and manufacturing for the space market, AXON' proposes a complete service from the choice of material or components, to the design, manufacturing, test and qualification of your products.

Space harness experience

AXON' harnesses are currently flying on various launcher programs (Ariane 5), manned flights (ISS, ATV), telecom satellites (Eurostar 3000, Spacebus 4000,...), scientific and observation satellites (Planck, Cryosat, SMOS, TerraSAR,...).

Certification

AXON' operators are certified by international space agencies on soldering and crimping processes (ECSS-Q-70-26C, ECSS-Q-ST-08C,...).

Additionally, some specific processes have been certified by the French CNES by a Part Identification Document (PID) to highlight AXON's expertise on Bus 1553, SpaceWire and Bus Bar harnesses.

Harness capabilities

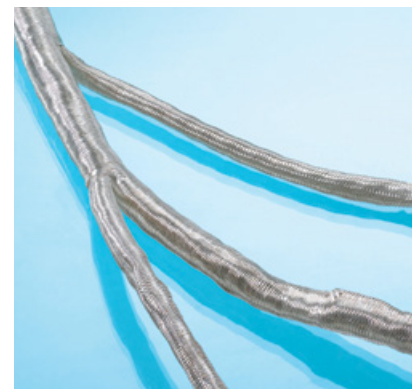
AXON' can design and manufacture electrical harnesses terminated with different types of crimped or soldered connectors, e.g. D-Sub, circular, twinaxial, Micro-D, Nano-D connectors, including accessories such as grounding terminals, thermistors, encapsulated resistors,...

These assemblies can be manufactured in one of our ISO 7 (class 10 000) and ISO 8 (class 100 000) clean rooms which represent a total surface area of some 500 m². The clean rooms allow for production with a continuously controlled temperature and humidity rate. Particles are controlled by independent companies once a year and AXON' operates additional intermediate controls.

For EMC improvement on the harnesses, AXON' uses a semi-automatic overshielding machine that makes it possible to braid a metallic screen over all harness branches with a controlled coverage rate to ensure shielding performances.



└ DATABUS HARNESSSES



└ OVERBRAIDED BRANCHED HARNESS

Assessment on material and components

Because a large part of the components are manufactured in-house (cables, Micro-D, Nano-D and twinax connectors, backshells and halorings), it is easy to get reliable material data to assess quality documents during the preliminary design phase.

Manufacturing and routing

2D or 3D cabling boards can be used to ensure the perfect integration at customer's facilities, in case the tolerances for length or routing are very tight.

AXON' can also directly work on a real scale mock-up provided by the customer to design the harness.

Means of test and control

The AXON' control laboratories have at their disposal a wide variety of in-house test equipment to validate the different components for use in space applications:

- Electrical characteristics:
 - Automatic continuity and insulation testing,
 - Dielectric strength,
 - Potential difference,
 - Current flow,
 - Capacitance,
 - Inductance,
 - Transfer impedance (shield efficiency),
 - Reflectometry,
 - Electrical resistance,
 - Presence of short circuits.
- Signal transmission:
 - Time domain:
 - Jitter (RMS, PP),
 - Skew (same pair, between pairs),
 - Eye opening,
 - Zc TDR (pair, connection),
 - TD Cross Talk,
 - ISI (Inter Symbol Interference),
 - Bit error rate B.E.R.,
 - Rise & fall time, overshoots.
 - Frequency domain:
 - Crosstalk (FEXT, NEXT),
 - Insertion loss,
 - Return Loss,
 - Attenuation,
 - Polarity (phase).



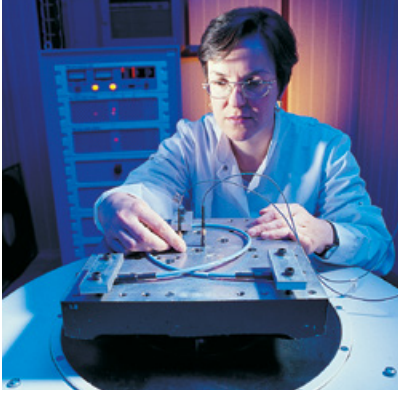
MANUFACTURING IN CLEANROOM



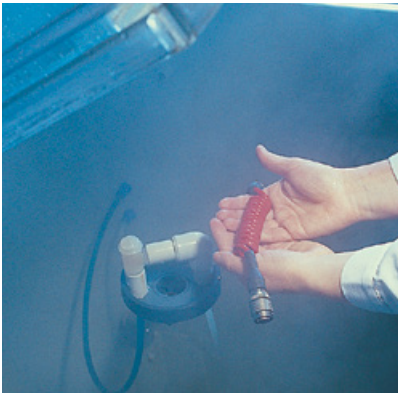
EYE PATTERN



AUTOMATIC CONTINUITY AND INSULATION TESTING



VIBRATION TEST



SALT SPRAY RESISTANCE TEST

- Climatic characteristics:
 - Resistance to salt spray,
 - Rapid change of temperature,
 - Accelerated ageing,
 - Climatic sequence,
 - Endurance at temperature,
 - Ovens in order to operate "burn-out" and minimize the global outgassing of the assembly.
- Mechanical characteristics:
 - Vibration: sinusoidal and random vibrations,
 - Shock,
 - Acceleration.
- Dimensions:
 - High sensitivity video equipment to control dimensions of miniature components,
 - X-ray machine to control inside moulded or potted assemblies which cannot be dismantled.

Any special tests can be carried out with the help of AXON's subcontractors.

Quality assurance for space products

AXON's quality organization is EN 9100 approved.

In order to fully satisfy customer needs and to guarantee total traceability AXON' has put in place an efficient quality organization for space projects.

- The assigned Product Assurance Manager (PA) is responsible for quality issues for each space project.
- A product assurance plan (PAP) defines the general quality rules according to which the harness project will be handled.
- Before answering a request for quotation a compliance matrix can be issued to check whether AXON's products, processes and organization meet the technical specification.
- AXON' has put in place configuration management and is able at any time to justify according to which customer specification, with which manufacturing instructions, specifications and which components the product has been manufactured.
- For any modification a change notice will be submitted to the customer to study the impact of the change.
- On request complete quality data packages called « End Item Data Packages: EIDP » can be delivered including the following information:
 - Configuration of the product and documentation,
 - Drawings,
 - Tracability,
 - Key inspection points,
 - Test procedures,
 - Test results,
 - Calibration status of measurement equipment,
 - Log books (mating - demating cycles),
 - User guides.

In addition AXON' has obtained a know how approval by the French Centre of Space Studies CNES (Centre National d'Etudes Spatiales) for the manufacture of MIL-STD-1553 Data Bus harnesses, SpaceWires harnesses, Power Interface Distribution Systems and ACB1 connectors. This agreement is recorded in a Process Identification Document (PID) which has to be renewed every two years.



QUALITY REVIEW