

# CRITICAL INSTRUMENTATION CABLES IN PARTICLE ACCELERATORS

Axon' Cable offers a wide range of low loss and flexible microwave coaxial assemblies.

They are mainly used for measurement, radar, antennae and surveillance systems.

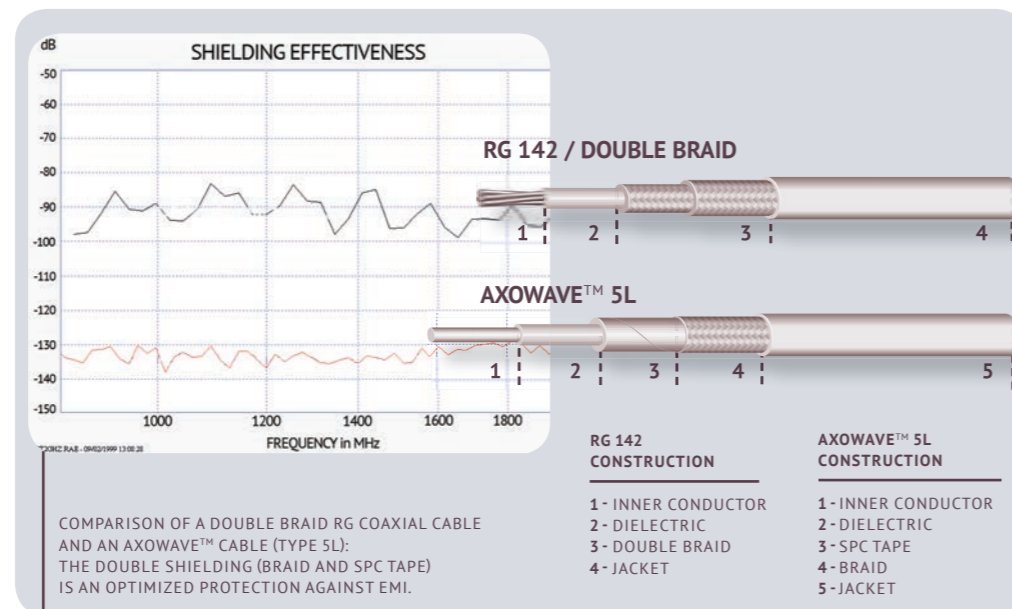
This is also an ideal solution to be used as instrumentation cables in Particle Accelerators for different applications:

- Storage Ring Diagnostics,
- Cabinet for storage of electronics boards of Photon Position detectors,
- Sensor stations,
- Power Amplifiers,
- Boards for Electronic Device Development.

## SHIELDING EFFECTIVENESS: a key issue

Any electronics system can both disturb and be disturbed by the creation of **EMI**. This is a key issue for applications such as **particle accelerators**. Instrumentation cables must be protected against electromagnetic interference to maintain signal integrity. Axowave™ microwave coaxial assemblies made by Axon' are designed to provide optimized shielding effectiveness up to 120 dB at 1 GHz.

The shielding effectiveness is the ability of a technology to screen out interference and to prevent RF leakage. It mainly depends on the frequency, on the construction of the shielding, on the connectors and their attachment to the cable.

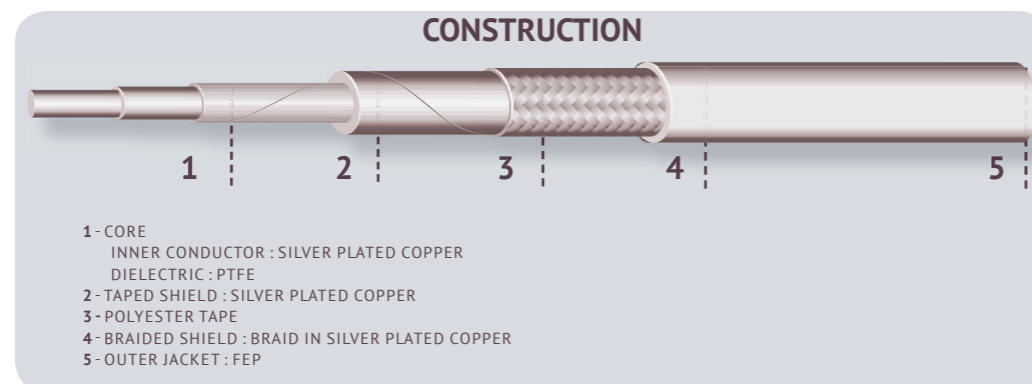


## FLEXIBLE SUBSTITUTES to semi-rigid cables

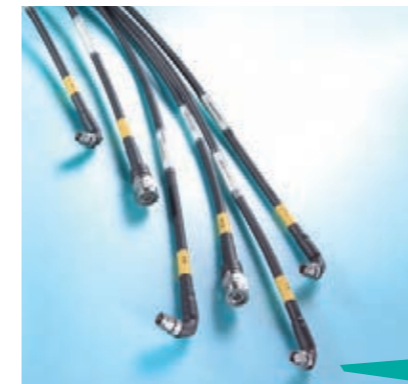
Coaxial cables of the AX™ family are **flexible substitutes to semi-rigid cables**.

Main advantages are as follows:

- Operating range up to 18 GHz.
- Compatible with all **standard connectors** (SMA, N, etc) used for semi-rigid cables.
- The flexibility of the cable makes the routing easier to make the connector within or between electronics boxes.
- Cost-effective solution.



## APPLICATION EXAMPLES



### RACK STATION

- Cabinet for storage of electronics boards of Photon Position detectors.
- Low frequency special cables terminated with SMA and SMB connectors
- . No signal interference.
- . Full EMI/EMC protection.

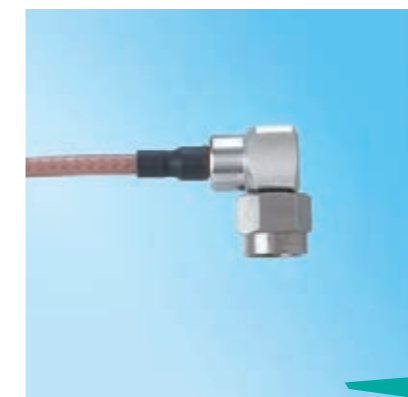
EXAMPLE OF CUSTOM DESIGNED MICROWAVE COAXIAL ASSEMBLY



### POWER AMPLIFIERS

- Connection of amplifiers to digital regulation module sensor.
- Axowave™ microwave cables terminated with male straight N type connector.
- Power: 700 W (CW) at 500 MHz.

AXOWAVE™ WITH N CONNECTOR



### STORAGE RING DIAGNOSTICS

- Short-length and long-length (up to 30 m) coaxial cable harness for Synchrotron Light Source.
- Sensor cables for Beam Position Measurement Electronics.
- Coaxial cables for connection from sensor to racks
- . No signal interference.
- . Full EMI/EMC protection.
- . AX™ cables terminated with right angle SMA connector and straight male SMA connector.
- . Frequency : 500 MHz.

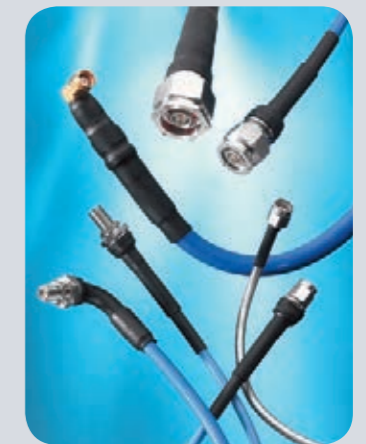
MICROWAVE COAXIAL CABLE ASSEMBLY TERMINATED WITH RIGHT ANGLE MALE SMA CONNECTOR



### BOARDS FOR ELECTRONIC DEVICE DEVELOPMENT

- Coaxial harness for Final Beam Position Measurement Electronics (EBPM) for Synchrotron Light source.
- Technical solutions integrating AX™ coaxial cables and combo Micro-D connectors made by Axon'.

COMBO MICRO-D CONNECTOR



## AXOWAVE™ low loss microwave coaxial cables

Axon' Cable designs and manufactures Axowave™ coaxial cable assemblies with very low losses. They are made with CELLOFLON®, a porous PTFE dielectric patented by Axon'.

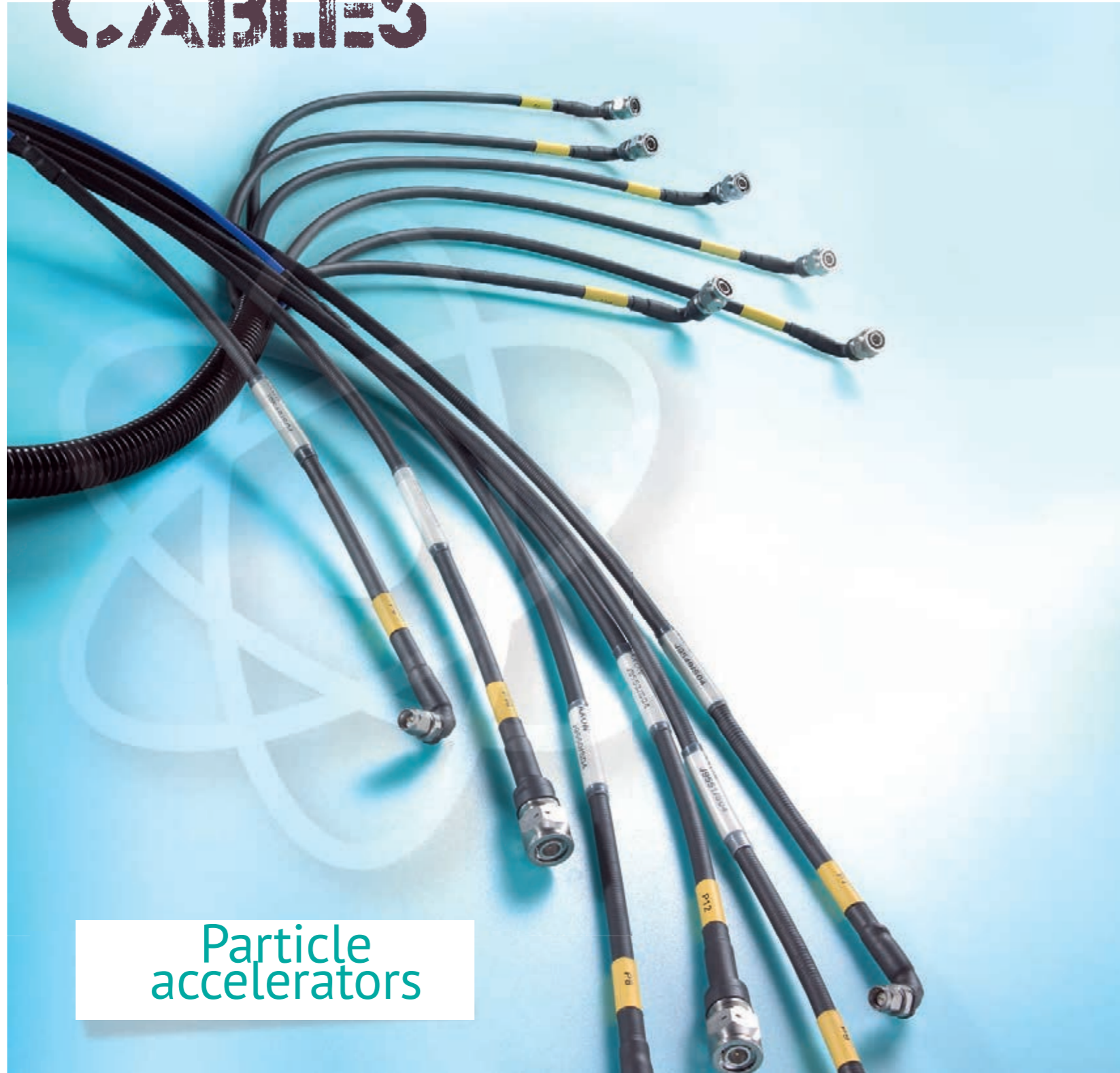
CELLOFLON® has the following advantages:

- better electrical performance of the cable
- lower insertion losses
- higher cut-off frequency
- faster propagation velocity.





# CRITICAL INSTRUMENTATION CABLES



Particle  
accelerators

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