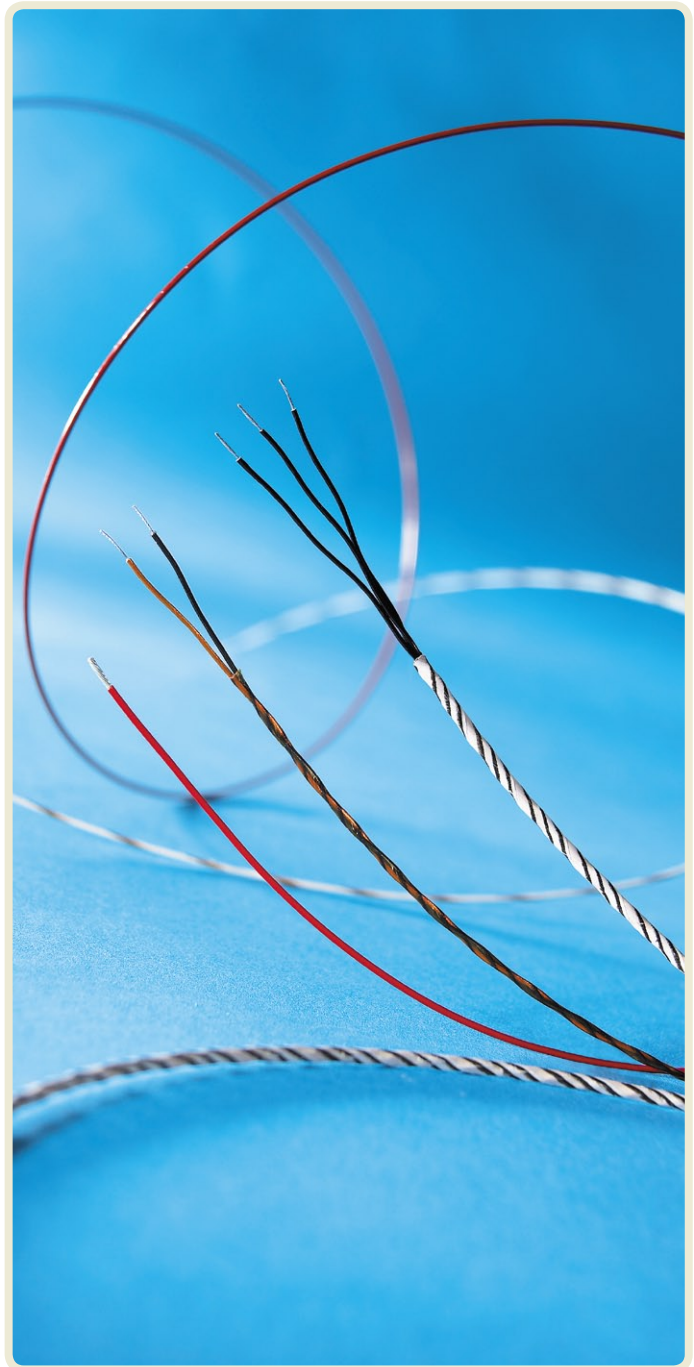
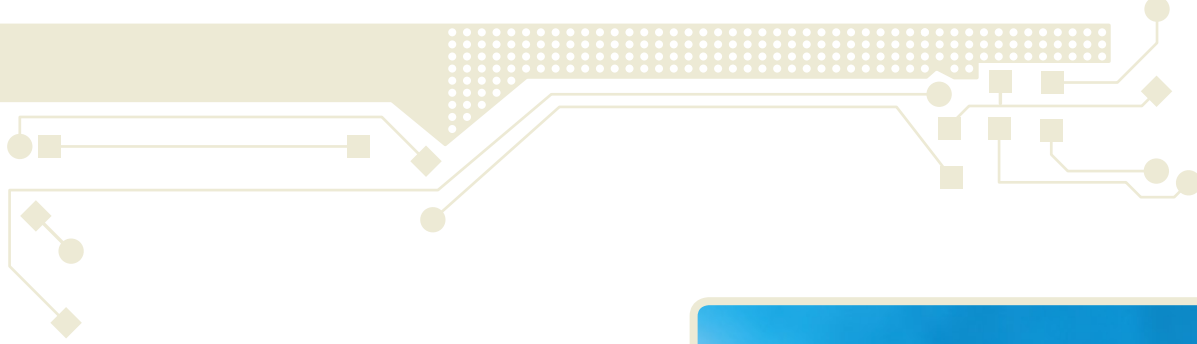


ESA wires & cables / AXALU®



AXALU®

AXALU®93

Selection guide

for ESCC low frequency cables, 600 VAC

ESCC wires and cables - AXALU® aluminium cables

AXON' supply a large range of wires and cables in compliance with ESA standards.

In addition AXON' has developed, together with Alcatel Space, AXALU® aluminium round cables for power distribution in satellites.

To help you chose the ESCC or AXALU® wire best suited to your application we propose the following selection guide.

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
ESCC 3901 001	Polyimide insulated wires and cables	-100°C to +200°C	Large conductor gauges: AWG 12 to 16.	HOT BIRD, LISA PATHFINDER, ARIANE 54, EUROSTAR 3000
ESCC 3901 002	Lightweight polyimide insulated wires and cables	-100°C to +200°C	Smaller conductor gauges than the ESCC 3901 001 family: AWG 18 to 28.	HOT BIRD, LISA PATHFINDER, GAIA, ARIANE 5, ALPHASAT, SENTINEL 2
ESCC 3901 012	Extruded cross-linked ETFE insulated wires and cables	-100°C to +200°C	Large range of conductor gauges from AWG 12 to 30.	CBERS, SAOCOM, SENTINEL
ESCC 3901 013	PTFE insulated wires and cables	-100°C to +200°C	Internal cabling of electronic boxes. PTFE allows for a thinner jacket and improves flexibility.	PLANCK, LISA PATHFINDER
ESCC 3901 018	Polyimide / Fluorothermoplastic insulated wires and cables	-200°C to +200°C	Low Earth Orbit (LEO) applications. Jacket resistant to atomic oxygen (ATOX) environment.	GOCE, BEPI COLOMBO
ESCC 3901 019	CELLOFLON® / Polyimide insulated wires and cables	-200°C to +200°C	Cryogenic applications (optical instruments), and wherever mass is a critical issue. Celloflon® is a weight saving material with high stability across large temperature range.	EXOMARS ROVER, GALILEO
ESCC 3901 021	CELLOFLON® / Polyimide insulated shielded cables with drain wire	-200°C to +200°C	Same as 019 family. In addition, a drain wire is provided to ease shield construction.	
ESCC 3901 024	Abrasion Resistance Tape (ART®) PTFE insulated wires and cables	-200°C to +200°C	Abrasion resistant ART® PTFE AXON' tape Improved flexibility and bend radius.	VEGA LAUNCHER

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
ESCC 3902 002	Coaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Coaxial line with 50 or 75 Ohms.	
ESCC 3902 002	Triaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Triaxial line with 50 or 75 Ohms.	
ESCC 3902 002	Twisted pair bus cable	-200°C to +180°C	Balanced shielded line with 75, 100 or 120 Ohms.	GAIA, HOT BIRD, SENTINEL 1
ESCC 3902 003	Quadribus cable	-200°C to +180°C	100 Ohms LVDS protocol like spacewire, IEEE 1394,...	AMS, COROT, GAIA, ALPHASAT

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
AXALU®	Aluminium silver plated conductors with cross-linked ETFE insulation	-100°C to +150°C	Power distribution systems on satellites. Weight-saving aluminium conductors.	SPACEBUS 2000 & 4000

AXALU[®] aluminium conductors and shields

AXALU[®]

Silverplated aluminium conductors and shields for light weight on-board wires and cables

AXON' has developed a whole range of silverplated aluminium conductors and shielding wires brandnamed AXALU[®]. Used for the manufacture of satellite data transmission and battery power distribution, AXALU[®] wires allow for a 50 to 60% weight saving regarding conductor and shielding in comparison with copper wires.

Due to the low atomic mass, AXALU[®] has also an advantage for the manufacture of shieldings with exposure to radiation (x-rays).



AXALU[®] ALLOWS FOR WEIGHT SAVING

Comparison Aluminium / Copper

	SP Aluminium	SP Copper
Dimensions	AWG 40 (solid) to AWG 6 (stranded)	AWG 50 to 4
Conductivity (% IACS)	63	100
Tensile strength (MPa)	150	240
Temperature rating (°C)	150	200
Density	2.7	8.89
Termination techniques	soldering / crimping	soldering / crimping
Weight saving	50% to 60%	



Single wires

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

- 1 - Stranded silver plated aluminium conductor.
- 2 - Extruded crosslinked ETFE insulation.

Main characteristics

- › 30 to 40 % weight saving compared to equivalent copper wires,
- › good cut-through resistance,
- › good resistance to radiation,
- › good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				MAX. DC RESISTANCE AT 20°C Ω / km	SINGLE WIRE MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm ²				
AXL 1 M 2419 AS1	24	19x0.12	0.62	0.215	145	0.83	1.22	
AXL 1 M 2219 AS1	22	19x0.15	0.77	0.336	92	1.00	1.70	
AXL 1 M 2019 AS1	20	19x0.20	1.02	0.597	52	1.25	2.65	
AXL 1 M 1819 AS1	18	19x0.25	1.27	0.933	33	1.50	3.83	
AXL 1 M 1619 AS1	16	19x0.30	1.52	1.343	23	1.85	5.63	
AXL 1 M 1437 AS1	14	37x0.25	1.77	1.816	17	2.22	8.08	
AXL 1 M 1237 AS1	12	37x0.32	2.26	2.98	10.30	2.82	12.88	
AXL 1 M 1037 AS1	10	37x0.405	2.86	4.77	6.40	3.57	20.41	
AXL 1 M 8133 AS1	8	133x0.287	4.34	8.6	3.60	4.97	34.27	

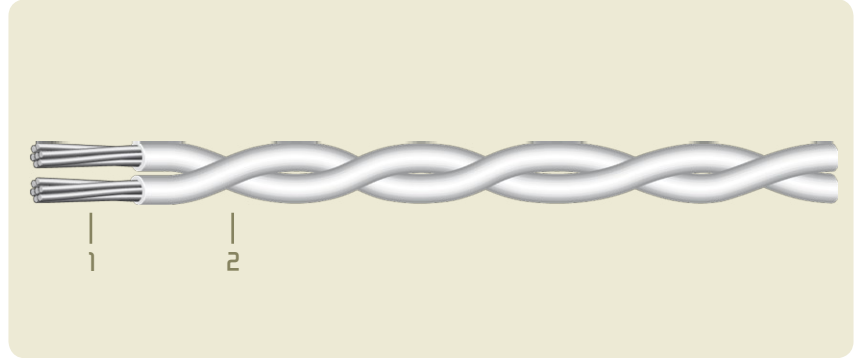
Twisted pairs

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

- 1 - Stranded silver plated aluminium conductor.
- 2 - Extruded crosslinked ETFE insulation.

Main characteristics

- > 30 to 40 % weight saving compared to equivalent copper wires,
- > good cut-through resistance,
- > good resistance to radiation,
- > good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				MAX. DC RESISTANCE AT 20°C Ω / km	SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm ²					
AXL 1 M 2419 AS2	24	19x0.12	0.62	0.215	150	0.83	1.66	2.56	
AXL 1 M 2219 AS2	22	19x0.15	0.77	0.336	95	1.00	2.00	3.51	
AXL 1 M 2019 AS2	20	19x0.20	1.02	0.597	53	1.25	2.50	5.45	
AXL 1 M 1819 AS2	18	19x0.25	1.27	0.933	34	1.50	3.00	7.89	
AXL 1 M 1619 AS2	16	19x0.30	1.52	1.343	23.5	1.85	3.70	11.6	
AXL 1 M 1437 AS2	14	37x0.25	1.77	1.816	17.4	2.22	4.50	16.65	
AXL 1 M 1237 AS2	12	37x0.32	2.26	2.98	10.6	2.82	5.70	26.54	
AXL 1 M 1037 AS2	10	37x0.405	2.86	4.77	6.6	3.57	7.20	42.05	
AXL 1 M 8133 AS2	8	133x0.287	4.34	8.6	3.7	4.97	10.00	71.00	

Shielded jacketed single wires

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

- 1 - Stranded silver plated aluminium conductor.
- 2 - Extruded crosslinked ETFE insulation.
- 3 - Silver plated aluminium braided shield.
- 4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- › 30 to 40 % weight saving compared to equivalent copper wires,
- › good cut-through resistance,
- › good resistance to radiation,
- › good EMI protection,
- › good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm ²	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS1C	24	19x0.12	0.62	0.215	145	0.1	0.83	1.60	3.86
AXL 1 M 2219 AS1C	22	19x0.15	0.77	0.336	92	0.1	1.00	1.77	4.55
AXL 1 M 2019 AS1C	20	19x0.20	1.02	0.597	52	0.1	1.25	2.02	6.15
AXL 1 M 1819 AS1C	18	19x0.25	1.27	0.933	33	0.1	1.50	2.26	8.02

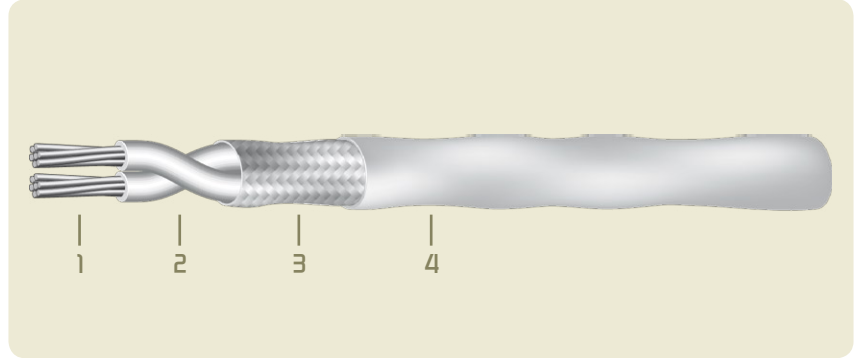
Shielded jacketed twisted pairs

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

- 1 - Stranded silver plated aluminium conductor.
- 2 - Extruded crosslinked ETFE insulation.
- 3 - Silver plated aluminium braided shield.
- 4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- > 30 to 40 % weight saving compared to equivalent copper wires,
- > good cut-through resistance,
- > good resistance to radiation,
- > good EMI protection,
- > good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm ²	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS2C	24	19x0.12	0.62	0.215	150	0.1	0.83	2.48	7.20
AXL 1 M 2219 AS2C	22	19x0.15	0.77	0.336	95	0.1	1.00	2.82	8.93
AXL 1 M 2019 AS2C	20	19x0.20	1.02	0.597	53	0.1	1.25	3.32	11.86
AXL 1 M 1819 AS2C	18	19x0.25	1.27	0.933	34	0.1	1.50	3.82	15.31

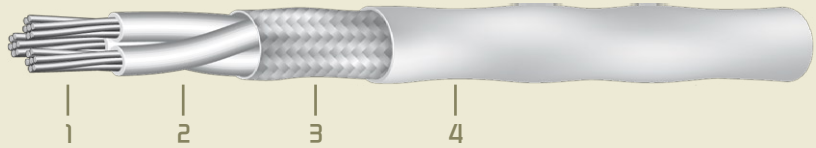
Shielded jacketed twisted triples

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

- 1 - Stranded silver plated aluminium conductor.
- 2 - Extruded crosslinked ETFE insulation.
- 3 - Silver plated aluminium braided shield.
- 4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- > 30 to 40 % weight saving compared to equivalent copper wires,
- > good cut-through resistance,
- > good resistance to radiation,
- > good EMI protection,
- > good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm ²	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS3C	24	19x0.12	0.62	0.215	150	0.1	0.83	2.65	9.00
AXL 1 M 2219 AS3C	22	19x0.15	0.77	0.336	95	0.1	1.00	3.02	11.32
AXL 1 M 2019 AS3C	20	19x0.20	1.02	0.597	53	0.1	1.25	3.55	15.48
AXL 1 M 1819 AS3C	18	19x0.25	1.27	0.933	34	0.1	1.50	4.09	20.58