axorad

radiation resistant cables
for scientific & nuclear
applications

www.axon-cable.com

axon' cables & connectors

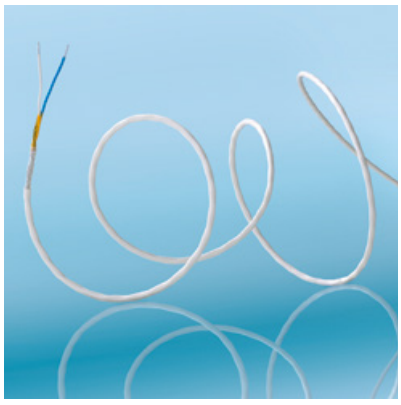
AXORAD

radiation resistant cables for scientific and nuclear applications

Contents

General information

CUSTOM DESIGNED HARNESS



HALOGEN FREE CABLE

AXORAD products

ETFE INSULATED WIRES

POLIAX LSZH THERMOPLASTIC INSULATED WIRES

NEUTRAX THERMOPLASTIC INSULATED WIRES

POLYIMIDE INSULATED WIRES

THERMOPLASTIC POLYURETHANE (TPU) INSULATED WIRES

CROSSLINKED POLYOLEFIN INSULATED WIRES

General information

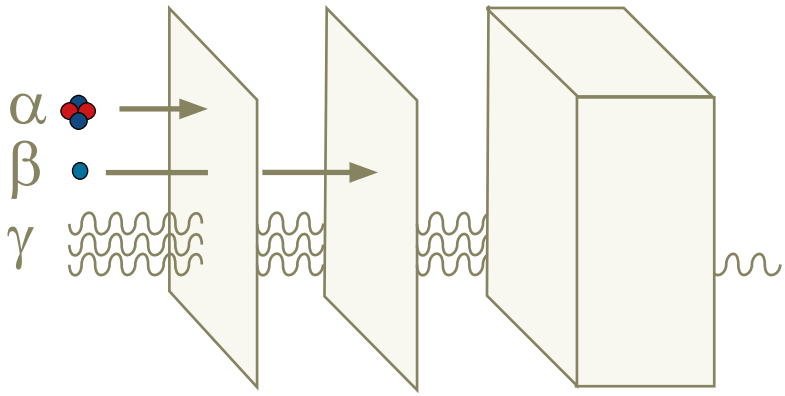
Radiation : what is it about ?

In physics, radiation describes a process in which energetic particles or waves travel through a medium or space. There are two distinct types of radiation :

› ionizing radiation : alpha and beta particles, gamma rays, X-Ray radiation and neutrons ; they may all be accelerated to a high enough energy to ionize atoms.

› non-ionizing radiation : electromagnetic radiation, visible light, infrared light, microwaves, radio waves, thermal radiation, …

The word «radiation» is commonly used in reference to ionizing radiation only, that means having sufficient energy to ionize an atom.



This figure illustrates the relative abilities of three different types of ionizing radiation to penetrate solid matter. Alpha particles (α) are stopped by a sheet of paper whilst beta particles (β) halt to an aluminium plate. Gamma radiation (γ) is dampened when it penetrates matter.

« Rad » (symbole rd), acronyme of « Radiation Absorbed Dose », is the former unit of radiation. Today this unit is replaced by the unit « gray » (symbole Gy /1 Gy = 1 J/kg),
1 rad = 1 centigray.
100 rads = 1 gray.
1 Mrad = 10 kGy
100 Mrad = 1 MGy

Specific insulation materials for severe environments

AXON' has gathered considerable experience in cable insulation with different materials adapted to the severe environments of scientific and nuclear applications, such as ETFE, special Thermoplastic compounds, Polyimides, Polyaryletherketones, crosslinked Polyolefins and Thermoplastic Polyurethanes.
These insulation materials can be proposed to manufacture control, instrumentation or sensor cables, for example:

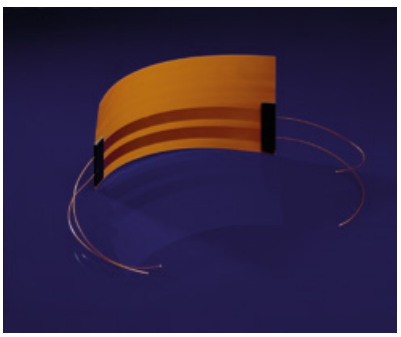
- Cables for probes controlling the cooling pipes of a nuclear plant,
- Harnesses for calorimeter probes of a particle detector,
- Quench heaters able to increase the temperature of the magnet situated in a particle detector.

a. Radiation and temperature resistance

Electronic systems can often be exposed to exceptional radiation levels, in many different fields of operation such as nuclear reactors, fusion reactors, high-energy accelerators, medical and industrial irradiation facilities, space stations, satellites etc.

Polymer materials applied in such environments degrade gradually by ageing with radiation and thermal oxidation. The damage are often due to exposure to ionizing or non-ionizing radiation sources including protons (alpha), electrons (beta), photons (gamma, X-rays/Bremsstrahlung) and even neutrons particles.

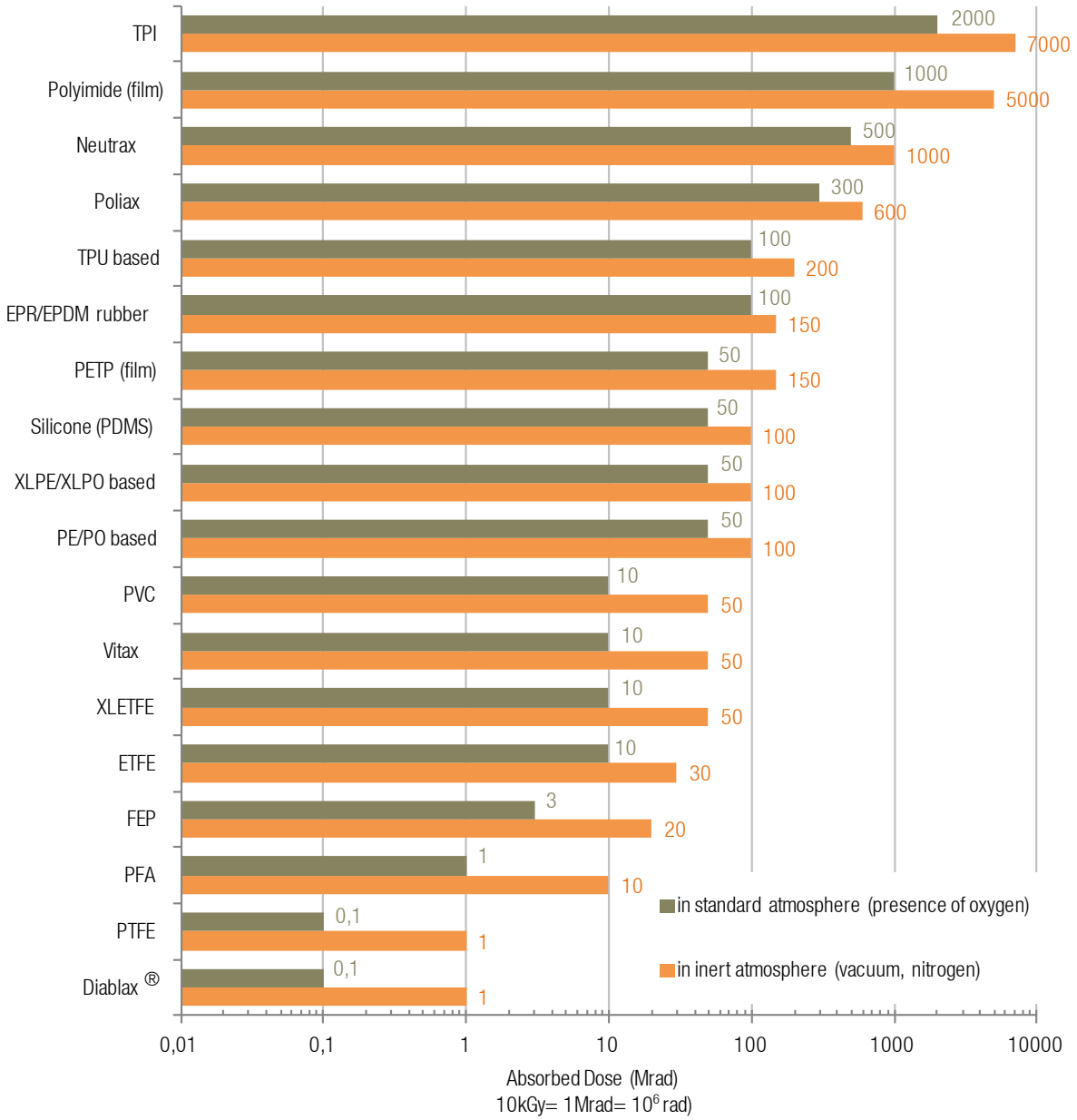
Based on the current state of the art, company experience, feedback and even its own internal radiation studies and investigations, Axon' can propose and help its customers to select the best and most adapted radiation-resistant wires and cables solutions for each specific requirements and environment.



CUSTOM DESIGNED HARNESS
PARTIALLY COPPER PLATED STAINLESS STEEL
CONDUCTOR WITH POLYIMIDE INSULATION

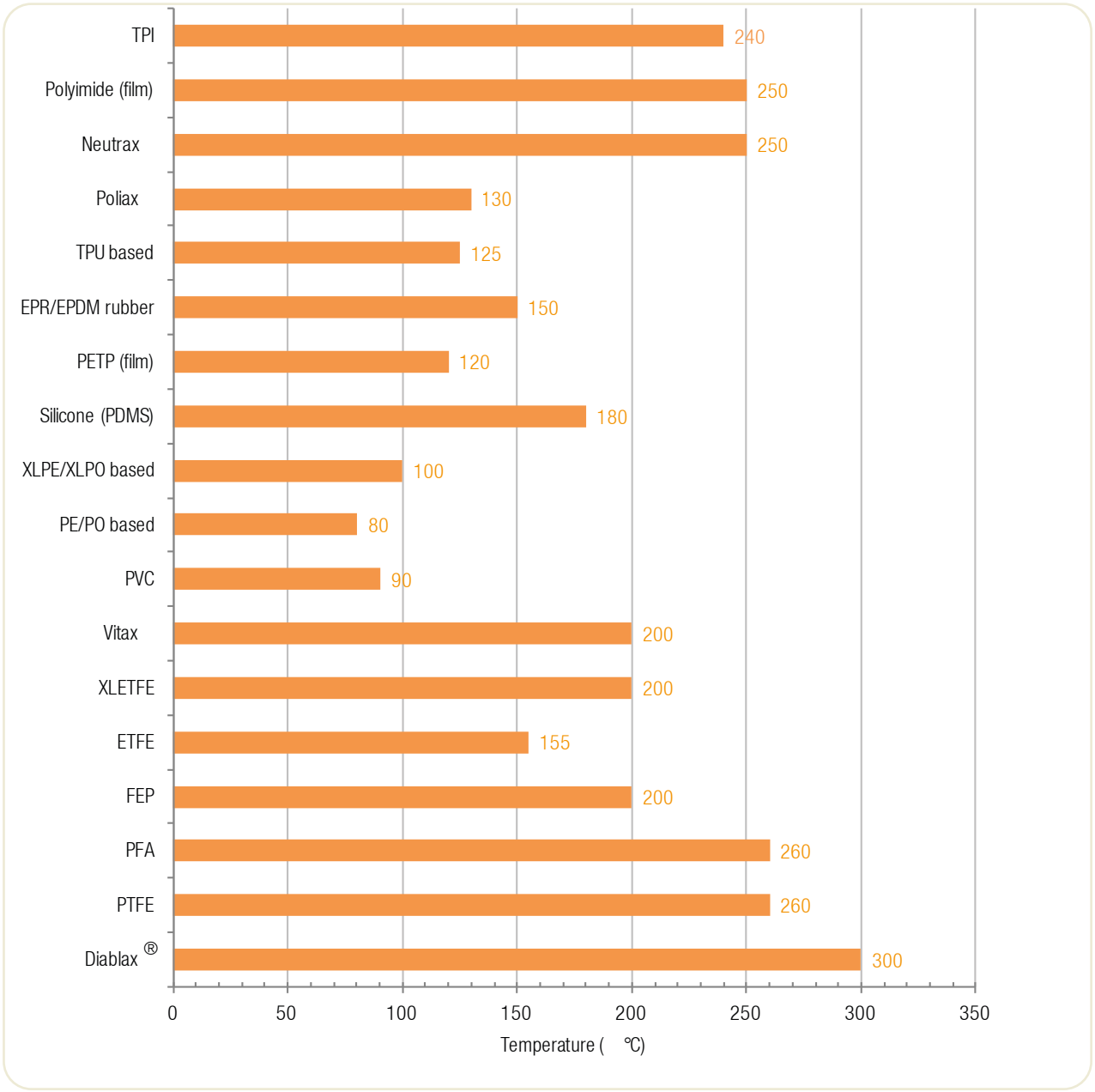
CUSTOM DESIGNED HARNESS
POLYIMIDE INSULATED 25 AND 50 OHM COAXIAL CABLES
WITH MICRO-D CONNECTORS
TEMPERATURE AND RADIATION RESISTANT

Radiation resistance (based on IEC 60544-4)



«These values can only serve as a general guideline ; exact nature of materials (chemical structure, molecular weight, presence and nature of additives) and environmental conditions such as temperature, humidity and dose rate influence the radiation behaviour of materials.»

Maximum continuous service temperature



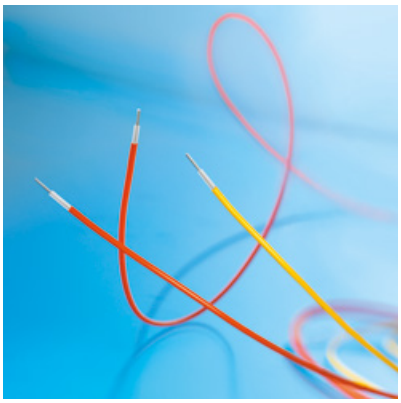
All these materials are resistant to low temperatures depending on operating conditions including static applications. Please consult us.

Radiation resistance, temperature resistance and Halogen free, LSZH behaviour

	RADIATION RESISTANCE (*)		TEMPERATURE RATING (°C)	HALOGEN FREE LSZH
	IN STANDARD ATMOSPHERE	IN INERT ATMOSPHERE		
TPI - EXTRUDED POLYIMIDE	20 MGy (2000 Mrad)	70 MGy (7000 Mrad)	240	YES
TAPED POLYIMIDE	10 MGy (1000 Mrad)	50 MGy (5000 Mrad)	250	YES
NEUTRAX™ (PAEK BASED)	5 MGy (500 Mrad)	10 MGy (1000 Mrad)	240	YES
POLIAX	3 MGy (300 Mrad)	6 MGy (600 Mrad)	135	YES
TPU - THERMOPLASTIC ELASTOMER	1 MGy (100 Mrad)	2 MGy (200 Mrad)	125	YES
PE/PO and XLPE/XLPO based	500 kGy (50 Mrad)	1 MGy (100 Mrad)	100	YES
ETFE	100 kGy (10 Mrad)	300 kGy (30 Mrad)	155	NO

*limits based on IEC 60544 - worst case scenarios (gamma + low dose rate) and end-point criteria (-50% strain or stress at break).
These values can only serve as a general guideline; exact nature of materials (chemical structure, molecular weight, presence and nature of additives) and environmental conditions such as temperature, humidity and dose rate influence the radiation behaviour of materials.

Radiation Resistance definition from IEC 60 544: for flexible plastics and elastomers in normal conditions, the most restrictive property is usually the strain or stress at break. The usual end-point criteria used to determine the «radiation resistance value» is then associated to the loss of 50% of the initial strain or stress at break of the material. Note that this does not necessarily refer to an end-of-life condition, especially for materials with high initial strain at break (>200%) including TPU, ETFE, crosslinked or uncrosslinked polyolefins.



HALOGEN FREE CABLE

b. Halogen free insulation materials

During a fire incident the most dangerous toxic gases emitted are acid gases such as hydrogen chloride (HCl), hydrogen fluoride (HF) and hydrogen bromide (HBr). These gases occur during combustion of materials containing halogen materials : Chlorine, Fluorine, Bromine, Iodine and Astatine. Consequently, the insulation materials of AXORAD (except ETFE) dot not contain halogen materials in response to security requirements.

REFERENCES
- AXON' CABLE, INTERNAL RESULTS : EFFECTS OF ELECTRON BEAM IRRADIATION UNDER INERT ATMOSPHERE ON MECHANICAL AND ELECTRICAL PROPERTIES OF POLYMERS AND ELECTRICAL WIRES INSULATIONS, 2016.
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- ROSENBERG, Y., ET AL., LOW DOSE γ-IRRADIATION OF SOME FLUOROPOLYMERS: EFFECT OF POLYMER CHEMICAL STRUCTURE. JOURNAL OF APPLIED POLYMER SCIENCE, 1992. 45(5): P. 783-795.
- SASUGA, T., ET AL., DEGRADATION IN TENSILE PROPERTIES OF AROMATIC POLYMERS BY ELECTRON BEAM IRRADIATION. POLYMER, 1985. 26(7): P. 1039-1045.
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- TAVLET, M. AND S. ILIE. BEHAVIOUR OF ORGANIC MATERIALS IN RADIATION ENVIRONMENT. IN RADIATION AND ITS EFFECTS ON COMPONENTS AND SYSTEMS, 1999. RADECS 99. 1999 FIFTH EUROPEAN CONFERENCE
- TAVLET, M. AND H. SCHÖNBACHER, COMPILATION OF RADIATION DAMAGE TEST DATA, PART 1 2ND EDITION: HALOGEN-FREE CABLE-INSULATING MATERIALS, 1989, GENEVA: CERN, 1989. - 220 P.
- SCHÖNBACHER, H., RESULTS OF RADIATION TESTS AT CRYOGENIC TEMPERATURE ON SOME SELECTED ORGANIC MATERIALS FOR THE LHC. 1996.
- SCHÖNBACHER, H. AND A. STOLARZ-IZYCKA, COMPILATION OF RADIATION DAMAGE TEST DATA: CABLE INSULATING MATERIALS - PART 1 - CABLE INSULATING MATERIALS, 1979.

LSZH : LOW SMOKE ZERO HALOGEN

c. Low smoke and fire hazard behaviour

Insulation materials of AXORAD do not propagate flame or fire. Except ETFE, these materials emit low or no toxic or corrosive fumes to save people and material in the case of a fire incident. Consistent testing has helped to define the behaviour of different insulation materials with regards to propagation of the flame, fume opacity, as well as toxicity and corrosivity of the gas emissions.

HALOGEN FREE CABLE

Most commonly required qualifications

FRENCH STANDARD	CORRESPONDANT INTERNATIONAL STANDARD		TESTS
CABLES			
NF C 32-70 TEST 1 CATEGORY C2	IEC 60 332-1	TESTS ON ELECTRICAL CABLES UNDER FIRE CONDITIONS.	NON PROPAGATION OF FLAME
NF C 32-70 TEST 2 CATEGORY C1	IEC 60 332-3		NON PROPAGATION OF FIRE
MATERIALS			
NF X 10-702	IEC 61 034-1 IEC 61 034-2	-	OPACITY OF FUMES
NF X 70-100	IEC 60 754-1	TESTS ON GASES EVOLVED DURING COMBUSTION OF MATERIALS FROM CABLES.	TOXICITY OF GAS
NF C 20-453	IEC 60 754-2	TEST ON GASES EVOLVED DURING COMBUSTION OF ELECTRICAL CABLES.	CORROSIVITY OF FUMES
-	IEC 60 544-4	ELECTRICAL INSULATING MATERIALS – DETERMINATION OF THE EFFECTS OF IONIZING RADIATION.	RADIATION RESISTANCE

Tests results

MATERIALS	PRIMARY INSULATION AND JACKETING							
	POLIAX	NEUTRAX PAEK BASED	TAPED POLYIMIDE	TPI POLYIMIDE	ASC3-92I TPO BASED	ASC3-55J TPO BASED	AXOTHERM® SILICONE BASED	TPUE85OHVO TPU BASED
OPERATING TEMPERATURE	+130°C	+200°C +250°C	+250°C	+240°C	+70°C	+70°C	+180°C	+125°C
FLAME RETARDANT	YES	YES	YES	YES	YES	YES	YES	YES
SMOKE EMISSION	Dm = 283 VOF4 = 30	Dm = 20 VOF4 = 1	-	-	Dm = 200 VOF4 = 8	Dm = 248 VOF4 = 64	Dm = 74 VOF4 = 85	Dm =253 VOF4 = 512
TOXICITY OF GAS EMISSION	ITC = 10	-	-	-	ITC = 4	ITC = 3	ITC = 1.6	ITC = 32
CORROSIVITY OF FUMES	pH = 7.1	-	-	-	pH = 7.85	pH = 5.2	pH = 4.7	pH = 8.9
TENSILE STRENGTH AT BREAK (MPa)	30	100	170	90	14	13	6.5	35
ELONGATION AT BREAK (%)	100	30 - 100	120	90	230	150	220	600
RESISTANCE TO OIL	VERY GOOD	EXCELLENT	VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD	AVERAGE	GOOD
RADIATION RESISTANCE	3-6 MGy 300 - 600 Mrad	5-10 MGy 500 - 1000 Mrad	10-50 MGy 1000 - 5000 Mrad	20-70 MGy 2000 - 7000 Mrad	500kGy-1MGy 50 - 100 Mrad	500kGy-1MGy 50 - 100 Mrad	500kGy-1MGy 50 - 100 Mrad	1-2 MGy 100 - 200 Mrad

ASC = AXON' SPECIAL COMPOUND
Dm = maximum optical density according to NF X 10-702 (corresponds to IEC 1034-1/2)
VOF4 = obscuration value due to fume during the first 4 minutes of test according to NF X 10-702 (corresponds to IEC 1034-1/2)
ITC = toxicity index calculated according to NF F 16-101 after analysis and proportionning according to NF X 70-100

AXOTHERM® IS REGISTERED TRADEMARK OF AXON' CABLE

Customer references

CUSTOMER REFERENCES	PROJECTS	COUNTRIES
LAL Laboratoire de l'Accélérateur Linéaire (Laboratory of Linear Accelerator)	BABAR, PLANCK SURVEYOR	FRANCE
IN2P3	EDELWEISS	FRANCE
ISN (Nuclear Science Institute)	ATLAS	FRANCE
CPPM (Center of particle physics, Marseille)	ATLAS	FRANCE
CEA (Centre d'Etudes Atomiques)	OLYMPO	FRANCE
GANIL	GANIL	FRANCE
CERN : European Laboratory of Particle Physics	LARGE HADRON COLLIDOR, DIFFERENT DETECTORS : ATLAS, ATHENA, HARP, ALICE CMS, LHC-B	SWITZERLAND
DESY - INFN	ZEUS	GERMANY - ITALY
MPI (Max Planck Institut)	ATLAS	GERMANY
UNIVERSITY OF ARIZONA (USA),	ATLAS	USA
UNIVERSITY OF VICTORIA	ATLAS	CANADA
DIFFERENT NUCLEAR PLANTS	COOLING PIPE PROBES	EUROPE
CEA CADARACHE ITER ORGANISATION	ITER	WORLDWIDE

COMPOSITE ROUND CABLE

Expertise in custom designed products

Based on radiation resistant wires AXORAD AXON' is able to propose hybrid composite round or flat cables as well as terminated harnesses including circular, rectangular, Micro-D, Nano-D or any other type of specific connector. Custom design is AXON's speciality, do not hesitate to contact us.

Electromagnetic compatibility EMC

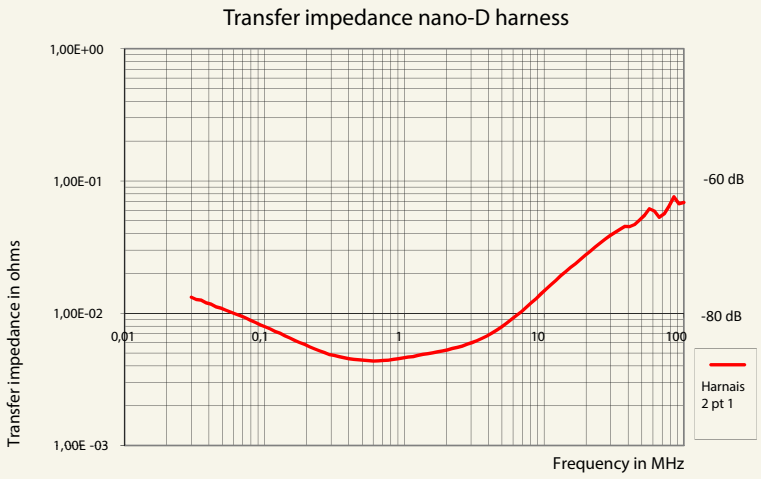
Electrical cables and interconnect assemblies are often the first systems affected by electromagnetic interference. AXON' CABLE has gathered expertise in EMI since 1986. This expertise is based on a coherent analysis of electromagnetic problems in order to guarantee a specified immunity of wires, cables and harnesses.

Electromagnetic perturbations have a hard life with AXON' CABLE's solutions for :

- Single wires and cables : adapted shielding with a braid or an over-braiding.
- Assemblies : shield terminations to achieve perfect cable / connector continuity
- Cabling accessories : range of shield termination bands AXOCLAMP®.

COMPOSITE ROUND CABLE

Example of transfer impedance result



AXOCLAMP® IS REGISTERED TRADEMARK OF AXON' CABLE

Colour code

PRIMARY WIRES OR STRIPES COLOURS ARE CODED ACCORDING TO THE TABLE BELOW

CODE	NATURAL	BLACK	BROWN	RED	ORANGE	YELLOW	GREEN	BLUE	VIOLET	GREY	WHITE
FRENCH	A	B	C	D	E	F	G	H	J	K	L
INTERNATIONAL		0	1	2	3	4	5	6	7	8	9

Standard multicores

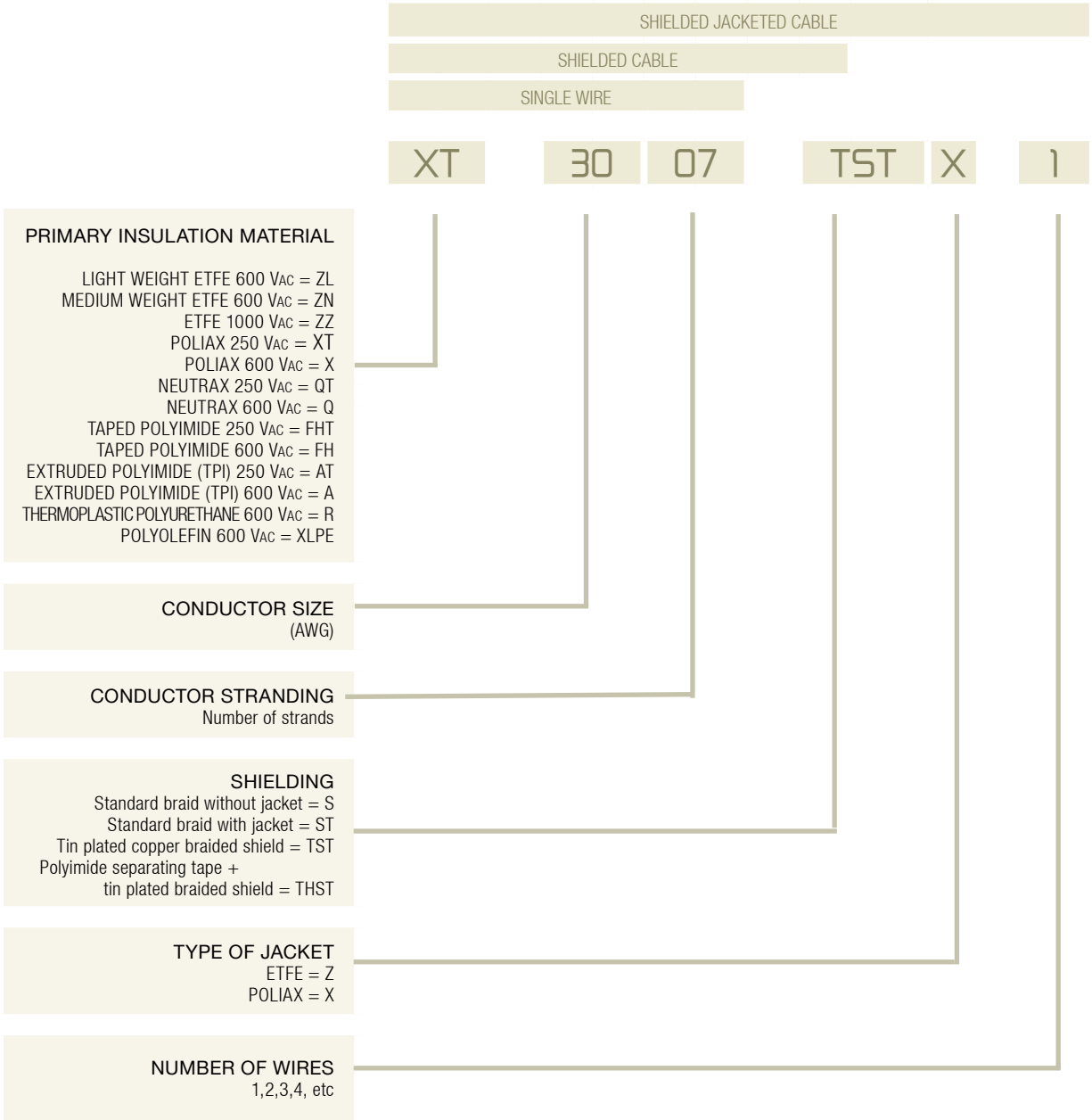
Standard multicores (unshielded, non-jacketed twisted pairs, triples and quads) can be manufactured on request. Their references are built by placing 2x, 3x or 4x in front of the reference of the primary wire.
For example : ZL 3007 STZ3 = a twisted triple composed of 3 ETFE insulated single wires AWG 3007 with overall braid and ETFE jacket.

STANDARD MULTICORES	AXON' REFERENCE	BUNDLE OUTER DIAMETER
TWISTED PAIRS	2 x (single wire reference)	2 x (single wire outer diameter)
TWISTED TRIPLES	3 x (single wire reference)	2.15 x (single wire outer diameter)
TWISTED QUADS	4 x (single wire reference)	2.41 x (single wire outer diameter)

The general features of the standard multicores, other than the outer diameter of the bundle, are easily calculated using the single wire technical sheets.

FOR FURTHER INFORMATION,
our sales team is at your disposal for any advice you may require.

AXON' reference identification code



NF reference identification code

KU 01 - xx	Single wires
KU 02 - xx	Shielded jacketed single wires
KU 05 - xx	Shielded jacketed twisted pairs
KU 06 - xx	Shielded jacketed twisted triples

Single wires

LIGHT WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759/18

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

STANDARD MULTICONDUCTORS : SEE PAGE 12

TYPE ZL xxxx TPC

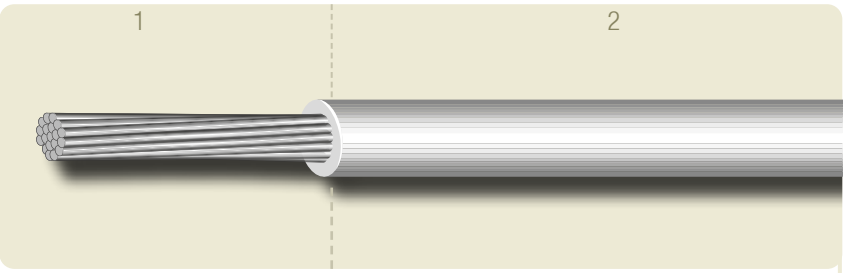
Insulation : ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white . Other colours or helicoidal stripes upon request. See page 12



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : extruded ETFE

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	NF REFERENCE	REFERENCE ACCORDING TO NEMA	AWG	CONDUCTOR				INSULATED WIRE	
				CONSTRUCTION (Nb x Ø mm)	NOMINAL Ø (mm)	NOMINAL AREA (mm²)	NOMINAL RESISTANCE (Ω / 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
ZL 3007	KU 01-30		30	7x0.102	0.304	0.057	33	0.63	0.90
ZL 2807	KU 01-28		28	7x0.127	0.381	0.089	21	0.70	1.30
ZL 2619	KU 01-26	M22759/18-26	26	19x0.102	0.483	0.15	12	0.80	1.90
ZL 2419	KU 01-24	M22759/18-24	24	19x0.127	0.597	0.24	7.6	0.92	2.80
ZL 2219	KU 01-22	M22759/18-22	22	19x0.160	0.762	0.38	5.0	1.10	4.20
ZL 2019		M22759/18-20	20	19x0.203	0.966	0.62	3.1	1.30	6.50
ZL 1819		M22759/18-18	18	19x0.254	1.207	0.96	2.0	1.55	9.75
ZL 1619			16	19x0.300	1.430	1.34	1.4	1.80	13.4
ZL 1419		M22759/18-14	14	19x0.360	1.702	1.94	0.98	2.16	19.5
ZL 1237		M22759/18-12	12	37x0.320	2.198	2.97	0.64	2.72	31.5
ZL 1037		M22759/18-10	10	37x0.405	2.769	4.74	0.40	3.41	50.0

NF REFERENCE : NF SPEC. APPROVED PRODUCTS - REFERENCE ACCORDING TO NEMA : PRODUCTS MANUFACTURED ACCORDING TO THE NEMA SPEC. BUT NOT APPROVED
TPC : TIN PLATED ANNEALED COPPER - AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Single wires

MEDIUM WEIGHT

TYPE ZN xxxx TPC

Insulation : ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white . Other colours or helicoidal stripes upon request. See page 12.

SPECIFICATIONS

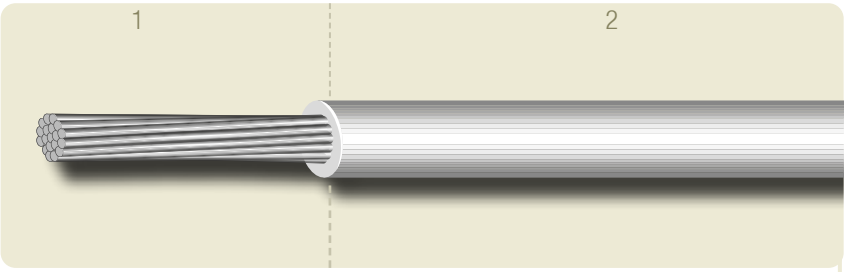
CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759/16

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

STANDARD MULTICONDUCTORS : SEE PAGE 12



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : extruded ETFE

Other possible construction : XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	NF REFERENCE	REFERENCE ACCORDING TO NEMA	AWG	CONDUCTOR				INSULATED WIRE	
				CONSTRUCTION (Nb x Ø mm)	NOMINAL Ø (mm)	NOMINAL AREA (mm²)	NOMINAL RESISTANCE (Ω / 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
ZN 3007			30	7x0.102	0.304	0.057	33	0.75	1.15
ZN 2807			28	7x0.127	0.381	0.089	21	0.82	1.50
ZN 2619			26	19x0.102	0.483	0.15	12	0.95	2.25
ZN 2419		M22759/16-24	24	19x0.127	0.597	0.24	7.6	1.15	3.40
ZN 2219		M22759/16-22	22	19x0.160	0.762	0.38	5.0	1.32	4.90
ZN 2019	KU 01-20	M22759/16-20	20	19x0.203	0.966	0.62	3.1	1.52	7.30
ZN 1819	KU 01-18	M22759/16-18	18	19x0.254	1.207	0.96	2.0	1.80	11.0
ZN 1619	KU 01-16		16	19x0.300	1.430	1.34	1.4	2.01	14.5
ZN 1419		M22759/16-14	14	19x0.360	1.702	1.94	0.98	2.35	20.7
ZN 1437	KU 01-14		14	37x0.254	1.778	1.87	1.03	2.35	20.0
ZN 1237	KU 01-12	M22759/16-12	12	37x0.320	2.198	2.97	0.64	2.90	33.0
ZN 1037		M22759/16-10	10	37x0.405	2.769	4.74	0.40	3.52	51.0
ZN 8133		M22759/16-8	8	133x0.287	4.200	8.60	0.22	5.05	90.0
ZN 6133		M22759/16-6	6	133x0.360	5.270	13.60	0.14	6.35	142.0
ZN 4133		M22759/16-4	4	133x0.455	6.650	21.70	0.09	7.90	222.0
ZN 2665		M22759/16-2	2	665x0.254	8.380	33.70	0.06	9.85	350.0
ZN 1817		M22759/16-1	1	817x0.254	9.400	41.40	0.05	10.95	430.0
ZN 01045		M22759/16-01	0	1045x0.254	10.550	52.95	0.04	12.15	543.0
ZN 001330		M22759/16-02	00	1330x0.254	11.750	67.39	0.03	13.90	699.0

NF REFERENCE : NF SPEC. APPROVED PRODUCTS - REFERENCE ACCORDING TO NEMA : PRODUCTS MANUFACTURED ACCORDING TO THE NEMA SPEC. BUT NOT APPROVED
TPC : TIN PLATED ANNEALED COPPER - AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Single wires

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

STANDARD
MULTICONDUCTORS :
SEE PAGE 12

TYPE ZZ xxxx TPC

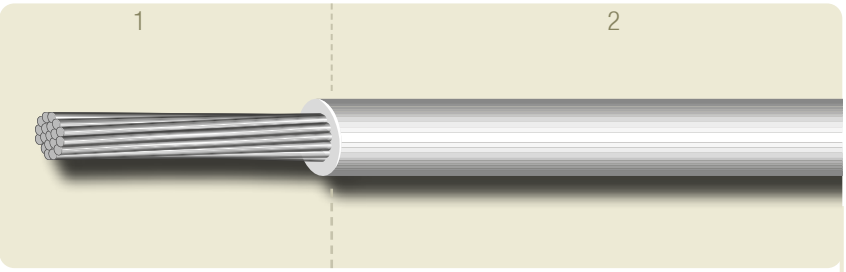
Insulation : ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 1000 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white . Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : extruded ETFE

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	NOMINAL Ø (mm)	NOMINAL AREA (mm²)	NOMINAL RESISTANCE (Ω / 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
ZZ 3007	30	7x0.102	0.304	0.057	33	1.00	1.80
ZZ 2807	28	7x0.127	0.381	0.089	21	1.10	2.20
ZZ 2619	26	19x0.102	0.483	0.15	12	1.20	3.00
ZZ 2419	24	19x0.127	0.597	0.24	7.6	1.34	4.00
ZZ 2219	22	19x0.160	0.762	0.38	5.0	1.52	5.60
ZZ 2019	20	19x0.203	0.966	0.62	3.1	1.72	8.10
ZZ 1819	18	19x0.254	1.207	0.96	2.0	2.00	11.9
ZZ 1619	16	19x0.300	1.430	1.34	1.4	2.20	15.8
ZZ 1419	14	19x0.360	1.702	1.94	0.98	2.60	22.2
ZZ 1237	12	37x0.320	2.198	2.97	0.64	3.10	34.2
ZZ 1037	10	37x0.405	2.769	4.74	0.40	3.60	54.7
ZZ 8133	8	133x0.287	4.200	8.60	0.22	5.20	92.2
ZZ 6133	6	133x0.360	5.270	13.60	0.14	6.25	126.0
ZZ 4133	4	133x0.455	6.650	21.70	0.09	7.85	200.0

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted pairs

LIGHT WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZL xxxx STZ 2 TPC

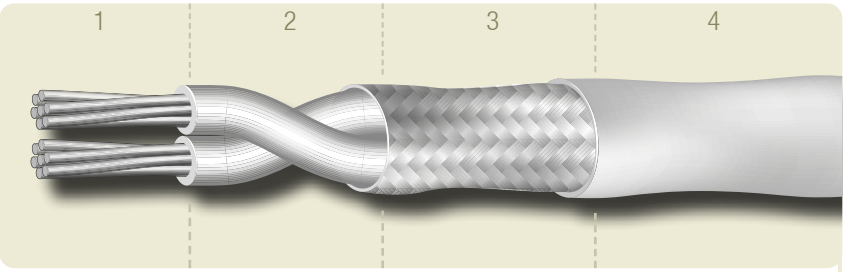
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZL 3007 STZ2	ZL 3007 or KU 01-30	0.63	0.102	1.70	2.15	7.80
ZL 2807 STZ2	ZL 2807 or KU 01-28	0.70	0.102	1.85	2.30	8.80
ZL 2619 STZ2	ZL 2619 or KU 01-26	0.80	0.127	2.15	2.70	10.7
ZL 2419 STZ2	ZL 2419 or KU 01-24	0.92	0.127	2.40	2.95	16.8
ZL 2219 STZ2	ZL 2219 or KU 01-22	1.10	0.127	2.75	3.30	20.6
ZL 2019 STZ2	ZL 2019	1.30	0.127	3.15	3.80	30.9
ZL 1819 STZ2	ZL 1819	1.55	0.127	3.65	4.30	40.8
ZL 1619 STZ2	ZL 1619	1.80	0.127	4.15	4.80	48.1

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted triples

LIGHT WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZL xxxx STZ 3 TPC

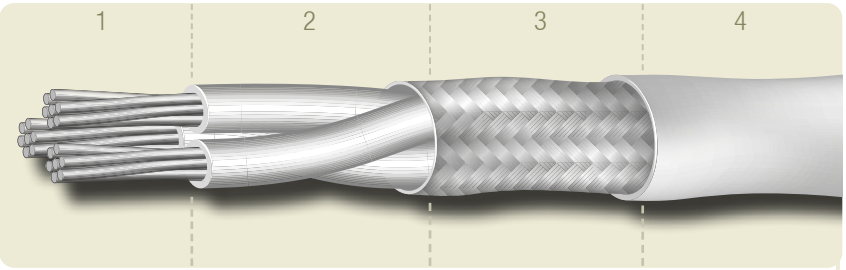
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZL 3007 STZ3	ZL 3007 or KU 01-30	0.63	0.102	1.80	2.25	11.3
ZL 2807 STZ3	ZL 2807 or KU 01-28	0.70	0.102	1.95	2.40	12.6
ZL 2619 STZ3	ZL 2619 or KU 01-26	0.80	0.127	2.30	2.85	15.3
ZL 2419 STZ3	ZL 2419 or KU 01-24	0.92	0.127	2.55	3.10	20.5
ZL 2219 STZ3	ZL 2219 or KU 01-22	1.10	0.127	2.90	3.50	27.8
ZL 2019 STZ3	ZL 2019	1.30	0.127	3.35	4.00	41.2
ZL 1819 STZ3	ZL 1819	1.55	0.127	3.80	4.45	56.0
ZL 1619 STZ3	ZL 1619	1.80	0.127	4.45	5.20	69.4

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted quads

LIGHT WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZL xxxx STZ 4 TPC

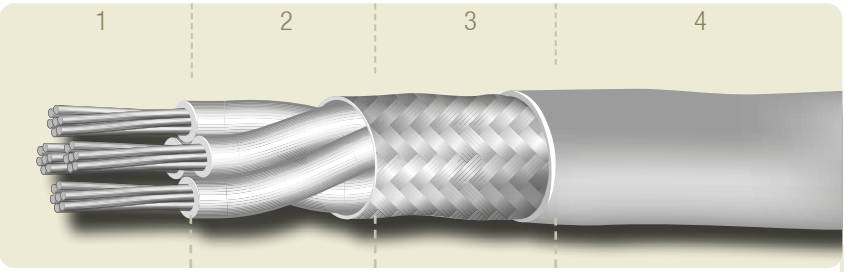
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE .

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZL 3007 STZ4	ZL 3007 or KU 01-30	0.63	0.127	2.05	2.55	15.7
ZL 2807 STZ4	ZL 2807 or KU 01-28	0.70	0.127	2.25	2.80	18.8
ZL 2619 STZ4	ZL 2619 or KU 01-26	0.80	0.127	2.50	3.05	24.4
ZL 2419 STZ4	ZL 2419 or KU 01-24	0.92	0.127	2.80	3.35	28.9
ZL 2219 STZ4	ZL 2219 or KU 01-22	1.10	0.127	3.20	3.85	37.2
ZL 2019 STZ4	ZL 2019	1.30	0.127	3.70	4.35	50.0
ZL 1819 STZ4	ZL 1819	1.55	0.127	4.30	5.05	69.5
ZL 1619 STZ4	ZL 1619	1.80	0.127	4.90	5.65	81.1

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed single core cables

MEDIUM WEIGHT

TYPE ZN xxxx STZ 1 TPC

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

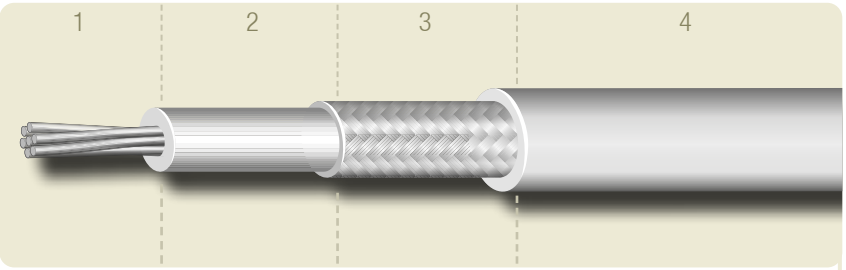
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZN 3007 STZ1	ZN 3007	0.75	0.102	1.20	1.65	7.30
ZN 2807 STZ1	ZN 2807	0.83	0.102	1.30	1.75	7.70
ZN 2619 STZ1	ZN 2619	0.96	0.102	1.40	1.85	8.70
ZN 2419 STZ1	ZN 2419	1.14	0.102	1.60	2.05	10.2
ZN 2219 STZ1	ZN 2219	1.32	0.102	1.80	2.25	13.6
ZN 2019 STZ1	ZN 2019 or KU 01-20	1.52	0.127	2.10	2.60	18.2
ZN 1819 STZ1	ZN 1819 or KU 01-18	1.80	0.127	2.35	2.90	23.3
ZN 1619 STZ1	ZN 1619 or KU 01-16	2.00	0.127	2.55	3.10	28.9
ZN 1419 STZ1	ZN 1419	2.35	0.127	2.90	3.45	36.0
ZN 1237 STZ1	ZN 1237 or KU 01-12	2.90	0.127	3.45	4.10	50.0
ZN 1037 STZ1	ZN 1037	3.52	0.127	4.10	4.80	80.0

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted pairs

MEDIUM WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZN xxxx STZ 2 TPC

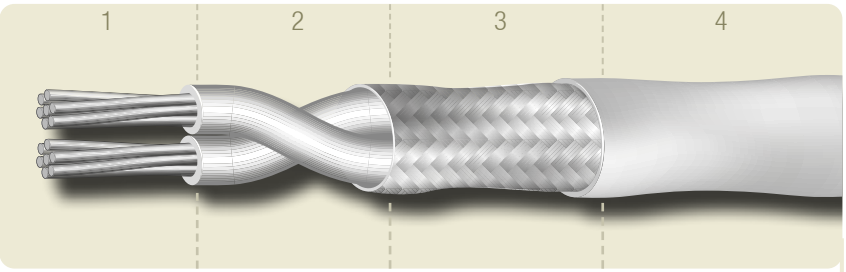
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy - (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZN 3007 STZ2	ZN 3007	0.75	0.102	1.95	2.40	10.9
ZN 2807 STZ2	ZN 2807	0.83	0.127	2.20	2.75	13.7
ZN 2619 STZ2	ZN 2619	0.96	0.127	2.50	3.00	17.7
ZN 2419 STZ2	ZN 2419	1.14	0.127	2.85	3.40	21.0
ZN 2219 STZ2	ZN 2219	1.32	0.127	3.20	3.85	27.8
ZN 2019 STZ2	ZN 2019 or KU 01-20	1.52	0.127	3.60	4.25	31.9
ZN 1819 STZ2	ZN 1819 or KU 01-18	1.80	0.127	4.15	4.90	40.0
ZN 1619 STZ2	ZN 1619 or KU 01-16	2.00	0.127	4.55	5.30	49.7
ZN 1419 STZ2	ZN 1419	2.35	0.127	5.25	6.10	68.0
ZN 1237 STZ2	ZN 1237 or KU 01-12	2.90	0.127	6.35	7.20	92.0
ZN 1037 STZ2	ZN 1037	3.52	0.127	7.60	8.60	154.0

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted triples

MEDIUM WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZN xxxx STZ 3 TPC

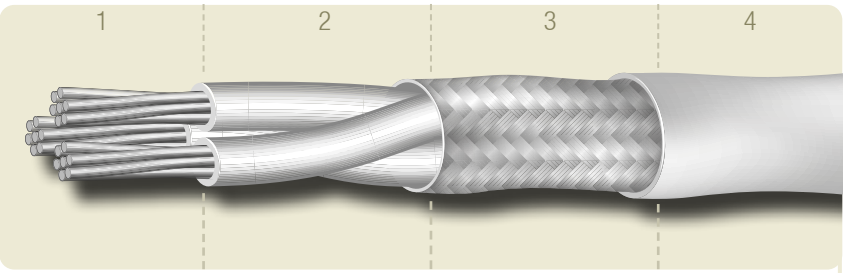
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : extruded ETFE

SHIELDING

3 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZN 3007 STZ3	ZN 3007	0.75	0.127	2.20	2.70	16.7
ZN 2807 STZ3	ZN 2807	0.83	0.127	2.35	2.90	18.4
ZN 2619 STZ3	ZN 2619	0.96	0.127	2.60	3.15	23.1
ZN 2419 STZ3	ZN 2419	1.14	0.127	3.00	3.65	29.0
ZN 2219 STZ3	ZN 2219	1.32	0.127	3.40	4.05	37.2
ZN 2019 STZ3	ZN 2019 or KU 01-20	1.52	0.127	3.80	4.45	43.1
ZN 1819 STZ3	ZN 1819 or KU 01-18	1.80	0.127	4.45	5.20	56.2
ZN 1619 STZ3	ZN 1619 or KU 01-16	2.00	0.127	4.85	5.60	71.0
ZN 1419 STZ3	ZN 1419	2.35	0.127	5.60	6.40	93.0
ZN 1237 STZ3	ZN 1237 or KU 01-12	2.90	0.127	6.80	7.80	135.0
ZN 1037 STZ3	ZN 1037	3.52	0.127	8.10	9.30	222.0

TPC : TIN PLATED ANNEALED COPPER

Shielded jacketed twisted quads

MEDIUM WEIGHT

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

INSULATED WIRE
NF-C-93524 - SAE-AS22759

CABLE
NEMA-WC27500

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE ZN xxxx STZ 4 TPC

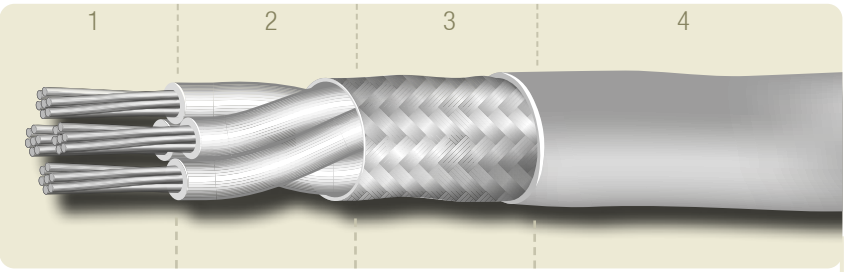
Insulation : ETFE / ETFE

Operating temperature : -90°C / +155°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
ZN 3007 STZ4	ZN 3007	0.75	0.127	2.35	2.90	18.7
ZN 2807 STZ4	ZN 2807	0.83	0.127	2.55	3.10	22.7
ZN 2619 STZ4	ZN 2619	0.96	0.127	2.85	3.40	26.3
ZN 2419 STZ4	ZN 2419	1.14	0.127	3.30	3.95	35.6
ZN 2219 STZ4	ZN 2219	1.32	0.127	3.75	4.40	44.2
ZN 2019 STZ4	ZN 2019 or KU 01-20	1.52	0.127	4.20	4.95	59.4
ZN 1819 STZ4	ZN 1819 or KU 01-18	1.80	0.127	4.90	5.60	79.0
ZN 1619 STZ4	ZN 1619 or KU 01-16	2.00	0.127	5.40	6.20	97.2
ZN 1419 STZ4	ZN 1419	2.35	0.127	6.20	7.20	135.4
ZN 1237 STZ4	ZN 1237 or KU 01-12	2.90	0.127	7.55	8.60	192.7
ZN 1037 STZ4	ZN 1037	3.52	0.160	9.20	10.40	308.0

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed single core cables

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

CABLE
NF-C-93524

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE KU 02 - xx TPC

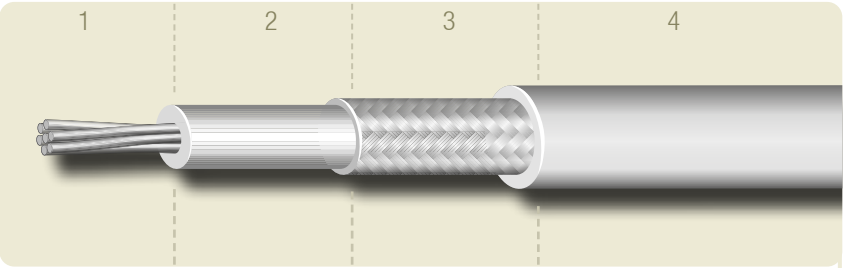
Insulation : ETFE / ETFE

Operating temperature : -55°C / +150°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : natural (transparent), black, brown, red, orange, yellow, green, blue, violet, grey, white - Jacket : white
Other colours or helicoidal stripes upon request. See page 12.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12 & p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
KU 02 - 30	KU 01 - 30	0.63	0.102	1.10	1.35	4.00
KU 02 - 28	KU 01 - 28	0.70	0.102	1.15	1.40	5.30
KU 02 - 26	KU 01 - 26	0.80	0.102	1.25	1.50	7.00
KU 02 - 24	KU 01 - 24	0.92	0.102	1.35	1.70	8.80
KU 02 - 22	KU 01 - 22	1.10	0.102	1.55	1.95	10.0
KU 02 - 20	KU 01 - 20	1.52	0.127	2.05	2.40	14.8
KU 02 - 18	KU 01 - 18	1.80	0.127	2.35	2.75	21.4
KU 02 - 16	KU 01 - 16	2.00	0.127	2.55	2.95	29.7
KU 02 - 14	KU 01 - 14	2.35	0.127	2.90	3.30	34.5
KU 02 - 12	KU 01 - 12	2.90	0.127	3.45	3.85	48.8

TPC : TIN PLATED ANNEALED COPPER
AXALU® IS REGISTERED TRADEMARK OF AXON' CABLE

Shielded jacketed twisted pairs

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

CABLE
NF-C-93524

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE KU 05 - xx TPC

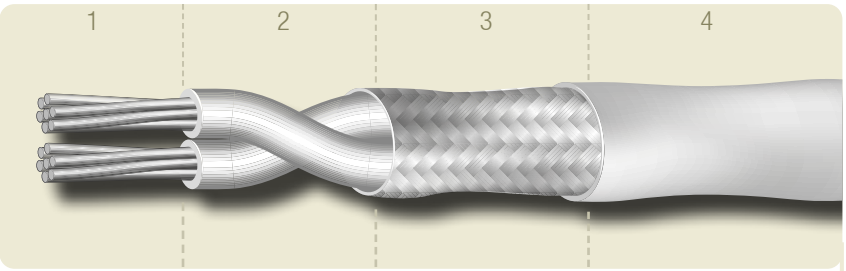
Insulation : ETFE / ETFE

Operating temperature : -55°C / +150°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : white, blue - Jacket : white
Other colours or helicoidal stripes upon request. See pages 17&21.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12 & p13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
KU 05 - 30	KU 01 - 30	0.63	0.102	1.70	2.10	8.50
KU 05 - 28	KU 01 - 28	0.70	0.102	1.85	2.20	9.50
KU 05 - 26	KU 01 - 26	0.80	0.127	2.15	2.50	12.1
KU 05 - 24	KU 01 - 24	0.92	0.127	2.40	2.80	18.8
KU 05 - 22	KU 01 - 22	1.10	0.127	2.75	3.15	21.1
KU 05 - 20	KU 01 - 20	1.52	0.127	3.60	4.00	29.2
KU 05 - 18	KU 01 - 18	1.80	0.127	4.15	4.60	39.3
KU 05 - 16	KU 01 - 16	2.00	0.127	4.55	5.00	49.5
KU 05 - 14	KU 01 - 14	2.35	0.127	5.25	5.75	65.7
KU 05 - 12	KU 01 - 12	2.90	0.127	6.35	6.80	96.7

TPC : TIN PLATED ANNEALED COPPER

Shielded jacketed twisted triples

SPECIFICATIONS

CONDUCTOR
ASTM-B-224 - ASTM-B-33

INSULATION
ASTM-D-3159

CABLE
NF-C-93524

ETFE IS IEEE (LOCA)
AND IEEE 383 APPROVED

TYPE KU 06 - xx TPC

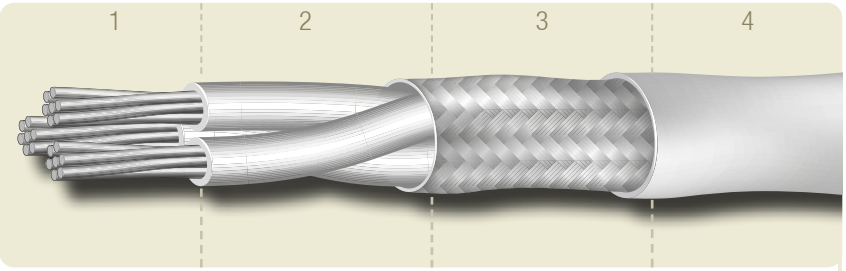
Insulation : ETFE / ETFE

Operating temperature : -55°C / +150°C

Voltage rating : 600 VAC

Radiation resistance : 100 kGy (10 Mrad) in standard atmosphere, 300 kGy (30 Mrad) in inert atmosphere.

Standard colours : Primary wire : white, blue, orange - Jacket : white
Other colours or helicoidal stripes upon request. See pages 18 & 22.



Construction

PRIMARY WIRE
1 - Conductor : tin plated annealed copper (TPC)
2 - Insulation : extruded ETFE
SHIELDING
3 - Braided shield : tin plated annealed copper (TPC)
OUTER JACKET
4 - Jacket : extruded ETFE.

Other possible construction :
XL ETFE (crosslinked ETFE) with even better abrasion, cut-through, temperature (200°C) and radiation resistance up to 100 kGy (10 Mrad) in standard atmosphere and 500 kGy (50 Mrad) in inert atmosphere. XL ETFE is Space grade material, used on ESCC 3901.012 and lightweight Axalu® product ranges.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING		OUTER JACKET	
	REFERENCE (see p12 & 13)	NOMINAL Ø (mm)	STRAND Ø (mm)	NOMINAL BRAIDED SHIELD Ø (mm)	NOMINAL OUTER Ø (mm)	APPROX WEIGHT (g/m)
KU 06 - 30	KU 01 - 30	0.63	0.102	1.80	2.30	11.4
KU 06 - 28	KU 01 - 28	0.70	0.102	1.95	2.45	12.6
KU 06 - 26	KU 01 - 26	0.80	0.127	2.25	2.70	15.7
KU 06 - 24	KU 01 - 24	0.92	0.127	2.50	2.90	23.8
KU 06 - 22	KU 01 - 22	1.10	0.127	2.90	3.30	26.4
KU 06 - 20	KU 01 - 20	1.52	0.127	3.80	4.25	39.8
KU 06 - 18	KU 01 - 18	1.80	0.127	4.40	4.85	53.7
KU 06 - 16	KU 01 - 16	2.00	0.127	4.85	5.25	68.7
KU 06 - 14	KU 01 - 14	2.35	0.127	5.60	6.15	92.8
KU 06 - 12	KU 01 - 12	2.90	0.127	6.75	7.30	137.4

TPC : TIN PLATED ANNEALED COPPER

Single wires

TYPE XT xxxx TPC

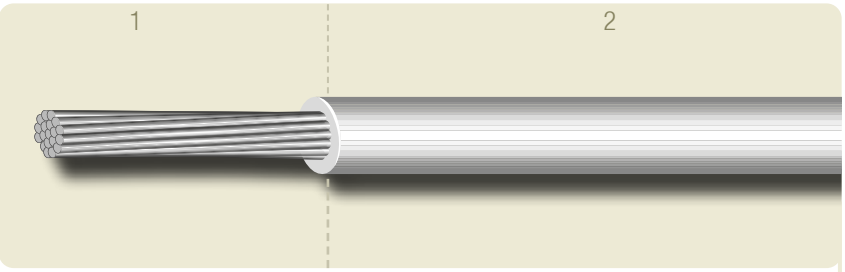
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 250 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Colours : according to the customers requirements



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	MAXIMUM RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
XT 2807 TPC	28	7 x 0.127	0.38	0.0886	20.8	0.70	1.10
XT 2619 TPC	26	19 x 0.102	0.48	0.154	12.87	0.80	1.80
XT 2419 TPC	24	19 x 0.127	0.60	0.24	7.66	0.95	2.70
XT 2237 TPC	22	37 x 0.114	0.78	0.38	5.08	1.10	4.20
XT 2037 TPC	20	37 x 0.142	0.97	0.59	3.37	1.30	6.20

OTHER CONSTRUCTIONS ON REQUEST

TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed single core cables

TYPE XT xxxx TSTX1 TPC

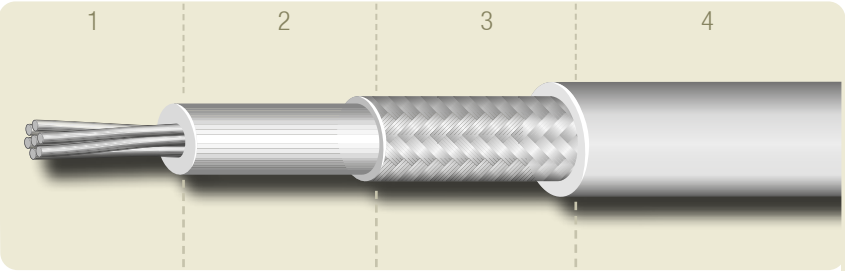
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 250 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

SHIELDING

3 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

4 - POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p25)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
XT 2807 TSTX 1	XT 2807 TPC	0.70	0.102	85	1.15	1.40	4.40
XT 2619 TSTX 1	XT 2619 TPC	0.80	0.102	96	1.25	1.50	6.50
XT 2419 TSTX 1	XT 2419 TPC	0.95	0.102	93	1.40	1.70	7.60
XT 2237 TSTX 1	XT 2237 TPC	1.10	0.102	88	1.55	1.90	9.50
XT 2037 TSTX 1	XT 2037 TPC	1.30	0.102	93	1.75	2.15	13.10

OTHER CONSTRUCTIONS ON REQUEST
TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed twisted pairs

TYPE XT xxxx THSTX2 TPC

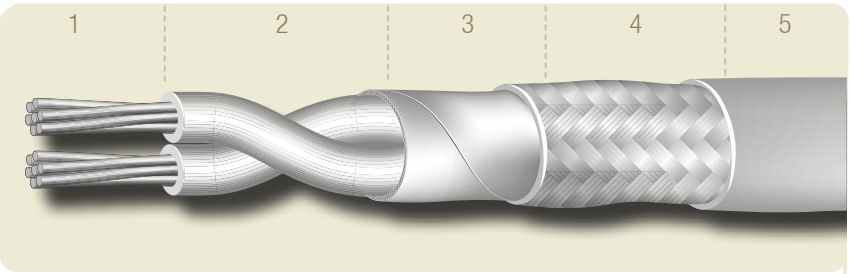
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 250 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere,
6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

TAPE

3 - Polyimide separating tape

SHIELDING

4 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

5 - POLIAX

Other possible construction :
Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p25)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
XT 2807 THSTX 2	XT 2807 TPC	0.70	0.102	85	1.90	2.20	8.00
XT 2619 THSTX 2	XT 2619 TPC	0.80	0.127	96	2.20	2.50	11.60
XT 2419 THSTX 2	XT 2419 TPC	0.95	0.127	93	2.50	2.80	15.80
XT 2237 THSTX 2	XT 2237 TPC	1.10	0.127	88	2.80	3.10	19.30
XT 2037 THSTX 2	XT 2037 TPC	1.30	0.127	93	3.20	3.55	28.50

OTHER CONSTRUCTIONS ON REQUEST
TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed twisted triples

TYPE XT xxxx THSTX3 TPC

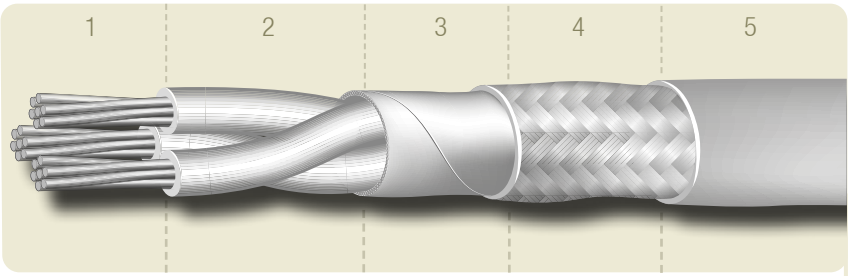
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 250 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

TAPE

3 - Polyimide separating tape

SHIELDING

4 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

5 - POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p25)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
XT 2807 THSTX 3	XT 2807 TPC	0.70	0.102	90	2.00	2.30	10.40
XT 2619 THSTX 3	XT 2619 TPC	0.80	0.127	93	2.30	2.60	15.50
XT 2419 THSTX 3	XT 2419 TPC	0.95	0.127	87	2.65	3.00	19.10
XT 2237 THSTX 3	XT 2237 TPC	1.10	0.127	90	2.95	3.30	25.80
XT 2037 THSTX 3	XT 2037 TPC	1.30	0.127	92	3.40	3.80	35.30

OTHER CONSTRUCTIONS ON REQUEST
TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE X xxxx TPC

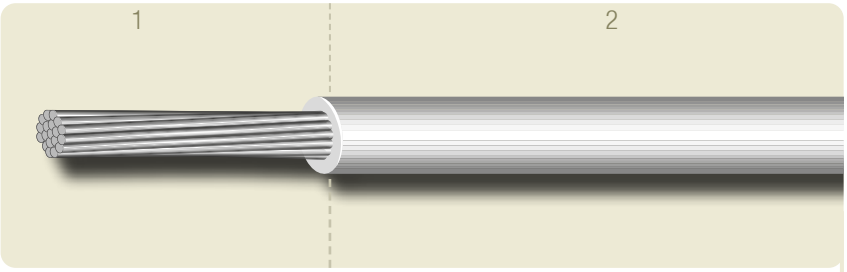
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 600 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Colours : according to the customers requirements



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	MAXIMUM RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
X 2807 TPC	28	7 x 0.127	0.38	0.0886	20.8	0.85	1.40
X 2619 TPC	26	19 x 0.102	0.48	0.154	12.87	0.95	2.00
X 2419 TPC	24	19 x 0.127	0.60	0.24	7.66	1.05	2.80
X 2237 TPC	22	37 x 0.114	0.78	0.38	5.08	1.20	4.40
X 2037 TPC	20	37 x 0.142	0.97	0.59	3.37	1.50	6.70
X 1861 TPC	18	61 x 0.142	1.24	0.97	2.05	1.80	10.60
X 1661 TPC	16	61 x 0.160	1.45	1.23	1.56	2.00	13.10
X 1461 TPC	14	61 x 0.203	1.75	1.91	1.04	2.35	20.80
X 1291 TPC	12	91 x 0.203	2.15	2.94	0.68	2.90	31.20
X 1091 TPC	10	91 x 0.254	2.70	4.46	0.43	3.55	47.60
X 8133 TPC	8	133 x 0.287	4.20	8.60	0.23	5.10	86.90

OTHER CONSTRUCTIONS ON REQUEST

TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed single core cables

TYPE X xxxx TSTX1 TPC

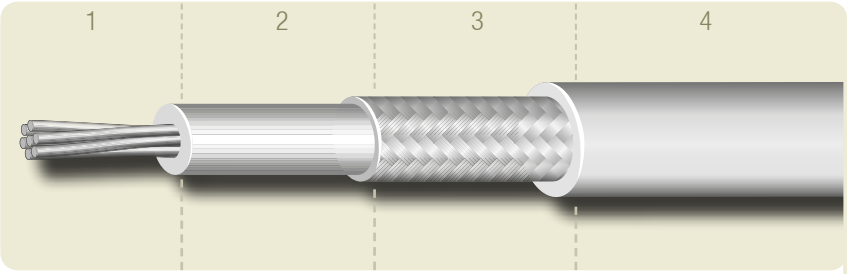
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 600 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

SHIELDING

3 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

4 - POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p29)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
X 2807 TSTX 1	X 2807 TPC	0.85	0.102	98	1.40	1.60	6.30
X 2619 TSTX 1	X 2619 TPC	0.95	0.102	95	1.50	1.75	7.10
X 2419 TSTX 1	X 2419 TPC	1.05	0.102	92	1.60	1.85	8.00
X 2237 TSTX 1	X 2237 TPC	1.20	0.127	96	1.75	2.15	12.40
X 2037 TSTX 1	X 2037 TPC	1.50	0.127	97	2.05	2.40	16.60
X 1861 TSTX 1	X 1861 TPC	1.80	0.127	92	2.35	2.75	21.00
X 1661 TSTX 1	X 1661 TPC	2.00	0.127	96	2.55	2.95	26.80
X 1461 TSTX 1	X 1461 TPC	2.35	0.127	91	2.90	3.50	35.10
X 1291 TSTX 1	X 1291 TPC	2.90	0.127	90	3.45	3.90	47.10
X 1091 TSTX 1	X 1091 TPC	3.55	0.127	89	4.10	4.90	63.30
X 8133 TSTX 1	X 8133 TPC	5.10	0.127	91	5.65	6.55	119.40

OTHER CONSTRUCTIONS ON REQUEST

TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed twisted pairs

TYPE X xxxx TSTX2 TPC

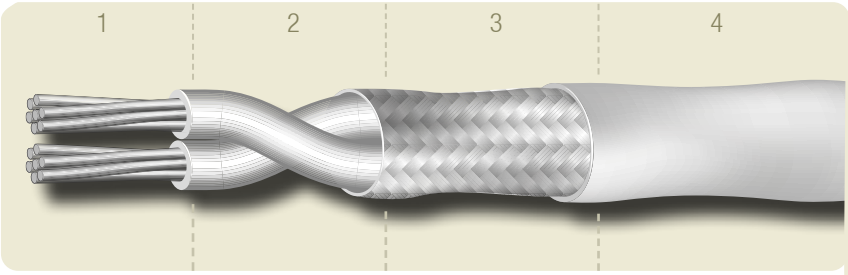
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 600 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

SHIELDING

3 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

4 - POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p29)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
X 2807 TSTX 2	X 2807 TPC	0.85	0.127	95	2.25	2.60	13.20
X 2619 TSTX 2	X 2619 TPC	0.95	0.127	90	2.45	2.80	14.50
X 2419 TSTX 2	X 2419 TPC	1.05	0.127	86	2.65	3.00	18.50
X 2237 TSTX 2	X 2237 TPC	1.20	0.127	91	2.95	3.35	22.40
X 2037 TSTX 2	X 2037 TPC	1.50	0.127	90	3.55	4.00	29.60
X 1861 TSTX 2	X 1861 TPC	1.80	0.127	91	4.15	4.60	41.70
X 1661 TSTX 2	X 1661 TPC	2.00	0.127	86	4.55	5.00	49.10
X 1461 TSTX 2	X 1461 TPC	2.35	0.127	89	5.25	5.90	69.60
X 1291 TSTX 2	X 1291 TPC	2.90	0.127	89	6.35	7.00	96.80
X 1091 TSTX 2	X 1091 TPC	3.55	0.160	87	7.80	8.90	146.30
X 8133 TSTX 2	X 8133 TPC	5.10	0.160	93	10.90	12.30	261.20

OTHER CONSTRUCTIONS ON REQUEST

TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Shielded jacketed twisted triples

TYPE X xxxx TSTX3 TPC

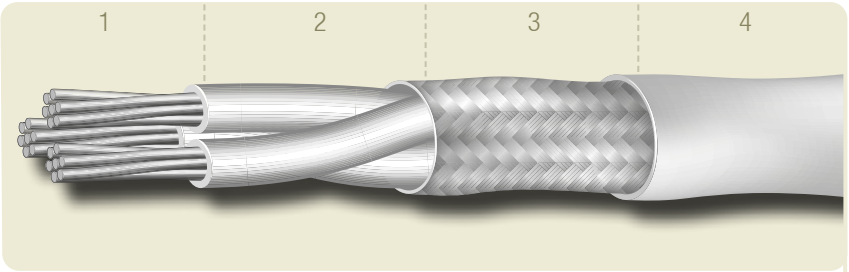
Insulation : POLIAX halogen free / LSZH

Operating temperature : -50°C up to +130°C

Voltage rating : 600 VAC

Radiation resistance : 3 MGy (300 Mrad) in standard atmosphere, 6 MGy (600 Mrad) in inert atmosphere.

Outer jacket colour : white. Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : POLIAX

SHIELDING

3 - Braided shield : tin plated annealed copper (TPC)

OUTER JACKET

4 - POLIAX

Other possible construction :

Pairs, triples and quads as well as shielded cables jacketed with other insulation materials will be studied according to the customers requirements.

AXON' REFERENCE	PRIMARY WIRE		SHIELDING			CABLE	
	REFERENCE (see p29)	Ø (mm)	SHIELDING WIRE Ø (mm)	COVERAGE (%)	SHIELDING Ø (mm)	NOMINAL Ø (mm)	WEIGHT (g/m)
X 2807 TSTX 3	X 2807 TPC	0.85	0.127	95	2.30	2.75	14.70
X 2619 TSTX 3	X 2619 TPC	0.95	0.127	90	2.50	3.00	19.00
X 2419 TSTX 3	X 2419 TPC	1.05	0.127	86	2.70	3.20	21.40
X 2237 TSTX 3	X 2237 TPC	1.20	0.127	91	3.15	3.60	29.40
X 2037 TSTX 3	X 2037 TPC	1.50	0.127	90	3.80	4.25	38.70
X 1861 TSTX 3	X 1861 TPC	1.80	0.127	91	4.40	4.95	54.90
X 1661 TSTX 3	X 1661 TPC	2.00	0.127	86	4.85	5.35	68.40
X 1461 TSTX 3	X 1461 TPC	2.35	0.127	89	5.60	6.25	93.60
X 1291 TSTX 3	X 1291 TPC	2.90	0.127	89	6.80	7.55	132.20
X 1091 TSTX 3	X 1091 TPC	3.55	0.160	87	8.35	9.55	208.00
X 8133 TSTX 3	X 8133 TPC	5.10	0.160	93	11.65	13.15	262.00

OTHER CONSTRUCTIONS ON REQUEST
TPC : TIN PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE QT xxxx SPC

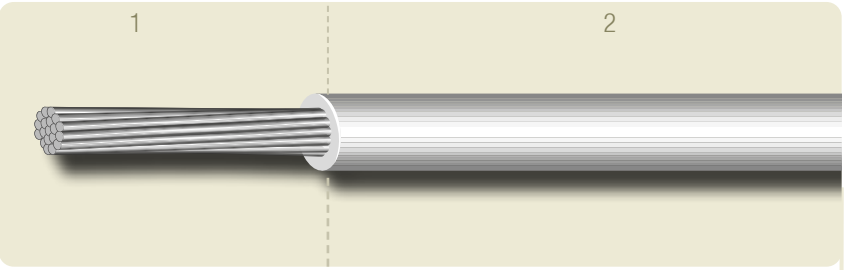
Insulation : NEUTRAX halogen free / LSZH

Operating temperature : -50°C up to +200°C

Voltage rating : 250 VAC

Radiation resistance : 5 MGy (500 Mrad) in standard atmosphere,
10 MGy (1000 Mrad) in inert atmosphere.

Standard colour : natural (beige). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC)

2 - Insulation : NEUTRAX

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
QT 3007	30	7 x 0.102	0.304	0.057	31.1	0.62	1.1
QT 2819	28	19 x 0.079	0.395	0.093	19.3	0.7	1.75
QT 2807	28	7 x 0.127	0.381	0.088	20.1	0.7	1.5
QT 2619	26	19 x 0.102	0.504	0.154	11.6	0.82	2.2
QT 2607	26	7 x 0.160	0.48	0.141	12.6	0.8	2.0
QT 2419	24	19 x 0.127	0.634	0.239	7.5	0.95	3.15
QT 2407	24	7 x 0.203	0.609	0.228	7.9	0.93	3.0
QT 2219	22	19 x 0.160	0.80	0.382	4.7	1.13	4.6
QT 2207	22	7 x 0.254	0.762	0.354	5.0	1.1	4.4
QT 2019	20	19 x 0.203	1.009	0.616	2.9	1.33	7.0
QT 2007	20	7 x 0.320	0.96	0.565	3.2	1.25	6.3

OTHER CONSTRUCTIONS ON REQUEST

SPC : SILVER PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE Q xxxx SPC

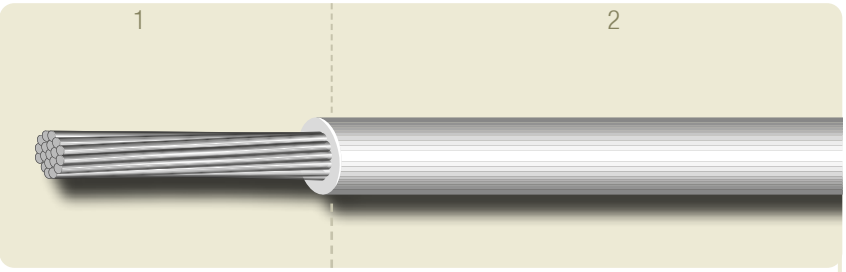
Insulation : NEUTRAX halogen free / LSZH

Operating temperature : -50°C up to +200°C

Voltage rating : 600 VAC

Radiation resistance : 5 MGy (500 Mrad) in standard atmosphere, 10 MGy (1000 Mrad) in inert atmosphere.

Standard colour : natural (beige). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC)

2 - Insulation : NEUTRAX

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
Q 3007	30	7 x 0.102	0.303	0.057	36.5	0.8	2.1
Q 2819	28	19 x 0.079	0.395	0.093	19.3	0.9	2.5
Q 2807	28	7 x 0.127	0.381	0.088	20.1	0.9	2.0
Q 2619	26	19 x 0.102	0.504	0.154	11.6	1.0	3.0
Q 2607	26	7 x 0.160	0.48	0.141	12.6	1.0	2.7
Q 2419	24	19 x 0.127	0.634	0.239	7.5	1.15	4.1
Q 2407	24	7 x 0.203	0.609	0.228	7.9	1.1	3.6
Q 2219	22	19 x 0.160	0.80	0.382	4.7	1.3	5.7
Q 2207	22	7 x 0.254	0.762	0.354	5.0	1.25	5.0
Q 2019	20	19 x 0.203	1.009	0.616	2.9	1.5	7.9
Q 2007	20	7 x 0.320	0.96	0.565	3.2	1.45	7.7
Q 1819	18	19 X 0.254	1.269	0.962	1.9	1.75	11.5
Q 1619	16	19 X 0.300	1.5	1.343	1.35	2.1	16.3
Q 1427	14	27 X 0.300	1.8	1.91	0.95	2.45	21.8
Q 1419	14	19 X 0.360	1.803	1.938	0.92	2.35	21.8
Q 1245	12	45 X 0.300	2.45	3.18	0.58	3.05	34.0
Q 1237	12	37 X 0.320	2.22	2.97	0.6	2.85	33.4
Q 1219	12	19 X 0.455	2.273	3.097	0.58	2.85	33.0
Q 1037	10	37 X 0.405	2.8	4.74	0.39	3.35	51.0

OTHER CONSTRUCTIONS ON REQUEST

SPC : SILVER PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE FHT xxxx SPC or SCA

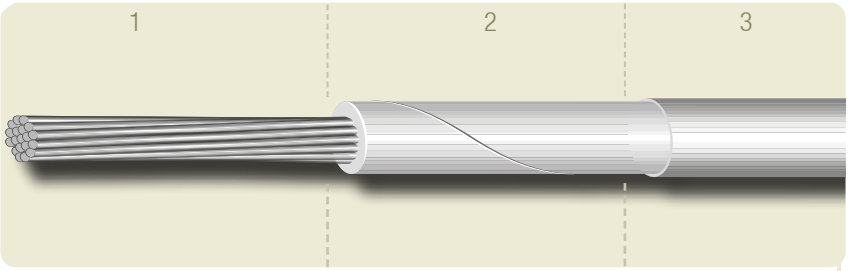
Insulation : POLYIMIDE tape halogen free / LSZH

Operating temperature : -100°C up to +200°C

Voltage rating : 250 VAC

Radiation resistance : 10 MGy (1000 Mrad) in standard atmosphere,
50 MGy (5000 Mrad) in inert atmosphere.

Standard colour : natural (amber). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC)
or silver plated copper alloy (SCA)
2 - Insulation : wrapped Polyimide tape (for extruded version, refers pages 41 to 44)
3 - Insulation : Polyimide coating

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
FHT 3007 SCA	30	7 x 0.102	0.304	0.057	37	0.53	0.76
FHT 3001 SCA	30	1 x 0.254	0.254	0.051	39	0.48	0.69
FHT 2807 SCA	28	7 x 0.127	0.381	0.089	23	0.61	1.11
FHT 2801 SCA	28	1 x 0.320	0.320	0.080	26	0.55	1.00
FHT 2619	26	19 x 0.102	0.504	0.16	12	0.74	1.79
FHT 2601	26	1 x 0.404	0.404	0.13	13	0.63	1.49
FHT 2419	24	19 x 0.127	0.634	0.24	7.6	0.86	2.65
FHT 2401	24	1 x 0.511	0.511	0.20	8.4	0.74	2.26
FHT 2219	22	19 x 0.160	0.800	0.38	4.7	1.03	4.73
FHT 2201	22	1 x 0.643	0.643	0.32	5.3	0.87	3.41
FHT 2019	20	19 x 0.203	1.009	0.616	3.2	1.24	6.26
FHT 2001	20	1 x 0.812	0.812	0.52	3.3	1.04	5.30
FHT 1819	18	19 x 0.254	1.269	0.96	2.1	1.50	9.63
FHT 1619	16	19 X 0.300	1.500	1.34	1.4	1.73	12.30

OTHER CONSTRUCTIONS ON REQUEST
SPC : SILVER PLATED ANNEALED COPPER - SCA : SILVER COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE FH xxxx SPC or SCA

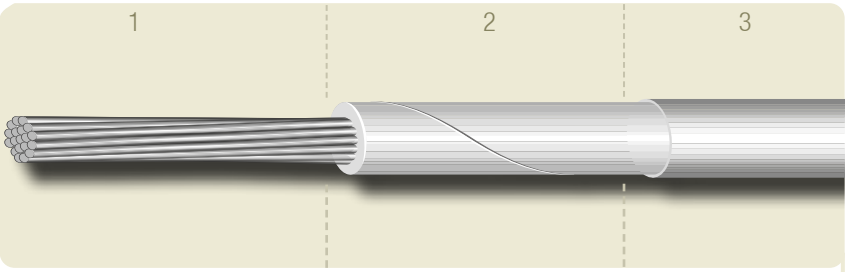
Insulation : POLYIMIDE tape halogen free / LSZH

Operating temperature : -100°C up to +200°C

Voltage rating : 600 VAC

Radiation resistance : 10 MGy (1000 Mrad) in standard atmosphere, 50 MGy (5000 Mrad) in inert atmosphere.

Standard colour : natural (amber). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC) or silver plated copper alloy (SCA)

2 - Insulation : wrapped Polyimide tape (for extruded version, refers pages 41 to 44)

3 - Insulation : Polyimide coating

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
FH 3007 SCA	30	7 x 0.102	0.303	0.057	37	0.60	0.88
FH 3001 SCA	30	1 x 0.254	0.254	0.051	39	0.55	0.78
FH 2807 SCA	28	7 x 0.127	0.381	0.089	23	0.68	1.24
FH 2801 SCA	28	1 x 0.320	0.320	0.080	26	0.62	1.11
FH 2619	26	19 x 0.102	0.504	0.16	12	0.81	1.94
FH 2601	26	1 x 0.404	0.404	0.13	13	0.70	1.62
FH 2419	24	19 x 0.127	0.634	0.24	7.6	0.93	2.82
FH 2401	24	1 x 0.511	0.511	0.20	8.4	0.81	2.42
FH 2219	22	19 x 0.160	0.800	0.38	4.7	1.10	4.14
FH 2201	22	1 x 0.643	0.643	0.32	5.3	0.94	3.58
FH 2019	20	19 x 0.203	1.009	0.61	3.2	1.31	6.51
FH 2001	20	1 x 0.812	0.812	0.52	3.3	1.11	5.50
FH 1819	18	19 x 0.254	1.269	0.96	2.1	1.57	9.92
FH 1619	16	19 X 0.300	1.500	1.34	1.4	1.80	12.60
FH 1419	14	19 x 0.361	1.805	1.94	0.95	2.15	19.80

OTHER CONSTRUCTIONS ON REQUEST

SPC : SILVER PLATED ANNEALED COPPER - SCA : SILVER COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE FHT xxxx NPC or NCA

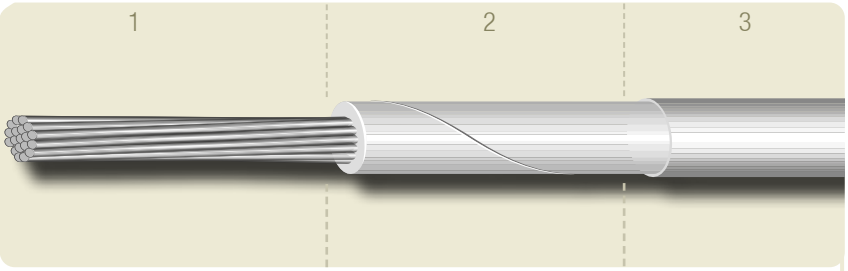
Insulation : POLYIMIDE tape halogen free / LSZH

Operating temperature : -100°C up to +250°C

Voltage rating : 250 VAC

Radiation resistance : 10 MGy (1000 Mrad) in standard atmosphere, 50 MGy (5000 Mrad) in inert atmosphere.

Standard colour : natural (amber). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : nickel plated annealed copper (NPC) or nickel plated copper alloy (NCA)
2 - Insulation : wrapped Polyimide tape (for extruded version, refers pages 41 to 44)
3 - Insulation : Polyimide coating

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
FHT 3007 NCA	30	7 x 0.102	0.304	0.057	37	0.53	0.76
FHT 3001 NCA	30	1 x 0.254	0.254	0.051	39	0.48	0.69
FHT 2807 NCA	28	7 x 0.127	0.381	0.089	23	0.61	1.11
FHT 2801 NCA	28	1 x 0.320	0.320	0.080	26	0.55	1.00
FHT 2619 NPC	26	19 x 0.102	0.504	0.16	12	0.74	1.79
FHT 2601 NPC	26	1 x 0.404	0.404	0.13	13	0.63	1.49
FHT 2419 NPC	24	19 x 0.127	0.634	0.24	7.6	0.86	2.65
FHT 2401 NPC	24	1 x 0.511	0.511	0.20	8.4	0.74	2.26
FHT 2219 NPC	22	19 x 0.160	0.800	0.38	4.7	1.03	4.73
FHT 2201 NPC	22	1 x 0.643	0.643	0.32	5.3	0.87	3.41
FHT 2019 NPC	20	19 x 0.203	1.009	0.616	3.2	1.24	6.26
FHT 2001 NPC	20	1 x 0.812	0.812	0.52	3.3	1.04	5.30
FHT 1819 NPC	18	19 x 0.254	1.269	0.96	2.1	1.50	9.63
FHT 1619 NPC	16	19 X 0.300	1.500	1.34	1.4	1.73	12.30

OTHER CONSTRUCTIONS ON REQUEST
NPC : NICKEL PLATED ANNEALED COPPER - NCA : NICKEL PLATED COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE FH xxxx NPC or NCA

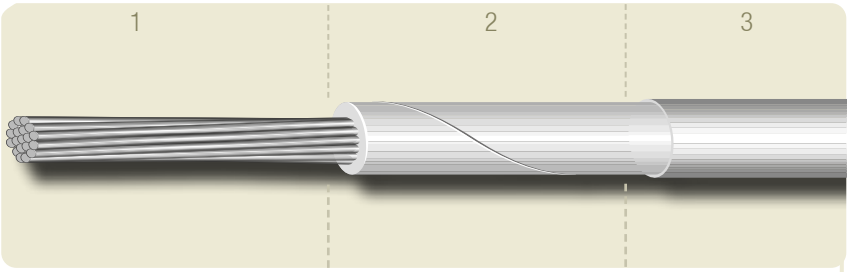
Insulation : POLYIMIDE tape halogen free / LSZH

Operating temperature : -100°C up to +250°C

Voltage rating : 600 VAC

Radiation resistance : 10 MGy (1000 Mrad) in standard atmosphere, 50 MGy (5000 Mrad) in inert atmosphere.

Standard colour : natural (amber). Other colours upon request.



Construction

PRIMARY WIRE

1 - Conductor : nickel plated annealed copper (NPC) or nickel plated copper alloy (NCA)

2 - Insulation : wrapped Polyimide tape (for extruded version, refers pages 41 to 44)

3 - Insulation : Polyimide coating

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
FH 3007 NCA	30	7 x 0.102	0.303	0.057	37	0.60	0.88
FH 3001 NCA	30	1 x 0.254	0.254	0.051	39	0.55	0.78
FH 2807 NCA	28	7 x 0.127	0.381	0.089	23	0.68	1.24
FH 2801 NCA	28	1 x 0.320	0.320	0.080	26	0.62	1.11
FH 2619 NPC	26	19 x 0.102	0.504	0.16	12	0.81	1.94
FH 2601 NPC	26	1 x 0.404	0.404	0.13	13	0.70	1.62
FH 2419 NPC	24	19 x 0.127	0.634	0.24	7.6	0.93	2.82
FH 2401 NPC	24	1 x 0.511	0.511	0.20	8.4	0.81	2.42
FH 2219 NPC	22	19 x 0.160	0.800	0.38	4.7	1.10	4.14
FH 2201 NPC	22	1 x 0.643	0.643	0.32	5.3	0.94	3.58
FH 2019 NPC	20	19 x 0.203	1.009	0.61	3.2	1.31	6.51
FH 2001 NPC	20	1 x 0.812	0.812	0.52	3.3	1.11	5.50
FH 1819 NPC	18	19 x 0.254	1.269	0.96	2.1	1.57	9.92
FH 1619 NPC	16	19 x 0.300	1.500	1.34	1.4	1.80	12.60
FH 1419 NPC	14	19 x 0.361	1.805	1.94	0.95	2.15	19.80

OTHER CONSTRUCTIONS ON REQUEST

NCA: NICKEL PLATED COPPER ALLOY - NPC : NICKEL PLATED ANNEALED COPPER - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE AT xxxx SPC or SCA

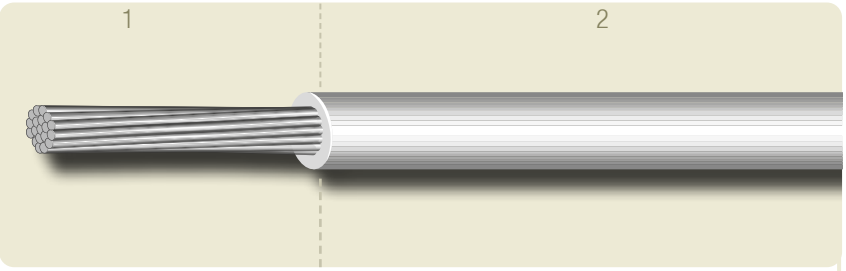
Insulation : Extruded POLYIMIDE (TPI) halogen free / LSZH

Operating temperature : -200°C up to +200°C

Voltage rating : 250 VAC

Radiation resistance : 20 MGy (2000 Mrad) in standard atmosphere, 70 MGy (7000 Mrad) in inert atmosphere.

Standard colour : natural (amber).



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC) or silver plated copper alloy (SCA)

2 - Insulation : extruded Polyimide (TPI)

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
AT 3007 SCA	30	7 x 0.102	0.304	0.057	37	0.62	0.84
AT 3001 SCA	30	1 x 0.254	0.254	0.051	39	0.56	0.72
AT 2807 SCA	28	7 x 0.127	0.381	0.089	23	0.70	1.20
AT 2801 SCA	28	1 x 0.320	0.320	0.080	26	0.65	1.10
AT 2619	26	19 x 0.102	0.504	0.16	12	0.82	2.00
AT 2601	26	1 x 0.404	0.404	0.13	13	0.72	1.50
AT 2419	24	19 x 0.127	0.634	0.24	7.6	0.95	2.80
AT 2401	24	1 x 0.511	0.511	0.20	8.4	0.83	2.30
AT 2219	22	19 x 0.160	0.800	0.38	4.7	1.13	4.20
AT 2201	22	1 x 0.643	0.643	0.32	5.3	0.95	4.00
AT 2019	20	19 x 0.203	1.009	0.616	3.2	1.33	6.50
AT 2001	20	1 x 0.812	0.812	0.52	3.3	1.13	5.30
AT 1819	18	19 x 0.254	1.269	0.96	2.1	1.61	10.00
AT 1619	16	19 X 0.300	1.500	1.34	1.4	1.87	14.00

OTHER CONSTRUCTIONS ON REQUEST

SPC : SILVER PLATED ANNEALED COPPER - SCA : SILVER COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE A xxxx SPC or SCA

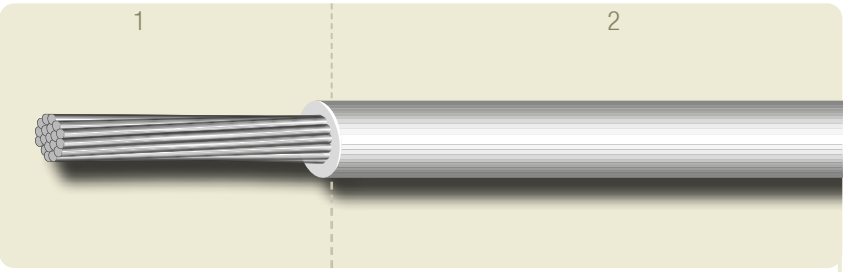
Insulation : extruded POLYIMIDE (TPI) halogen free / LSZH

Operating temperature : -200°C up to +200°C

Voltage rating : 600 VAC

Radiation resistance : 20 MGy (2000 Mrad) in standard atmosphere, 70 MGy (7000 Mrad) in inert atmosphere.

Standard colour : natural (amber).



Construction

PRIMARY WIRE

1 - Conductor : electrolytic silver plated annealed copper (SPC) or silver plated copper alloy (SCA)

2 - Insulation : extruded Polyimide (TPI)

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
A 3007 SCA	30	7 x 0.102	0.303	0.057	37	0.80	1.10
A 3001 SCA	30	1 x 0.254	0.254	0.051	39	0.76	1.00
A 2807 SCA	28	7 x 0.127	0.381	0.089	23	0.90	1.50
A 2801 SCA	28	1 x 0.320	0.320	0.080	26	0.82	1.30
A 2619	26	19 x 0.102	0.504	0.16	12	1.00	2.20
A 2601	26	1 x 0.404	0.404	0.13	13	0.90	1.80
A 2419	24	19 x 0.127	0.634	0.24	7.6	1.15	3.20
A 2401	24	1 x 0.511	0.511	0.20	8.4	1.05	2.70
A 2219	22	19 x 0.160	0.800	0.38	4.7	1.30	4.60
A 2201	22	1 x 0.643	0.643	0.32	5.3	1.15	3.40
A 2019	20	19 x 0.203	1.009	0.61	3.2	1.50	7.00
A 2001	20	1 x 0.812	0.812	0.52	3.3	1.30	5.70
A 1819	18	19 x 0.254	1.269	0.96	2.1	1.75	10.40
A 1619	16	19 X 0.300	1.500	1.34	1.4	2.10	14.80
A 1419	14	19 x 0.361	1.805	1.94	0.95	2.35	20.40
A 1237	12	37 x 0.320	2.22	2.98	0.60	2.85	31.20

OTHER CONSTRUCTIONS ON REQUEST

SPC : SILVER PLATED ANNEALED COPPER - SCA : SILVER COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE AT xxxx NPC or NCA

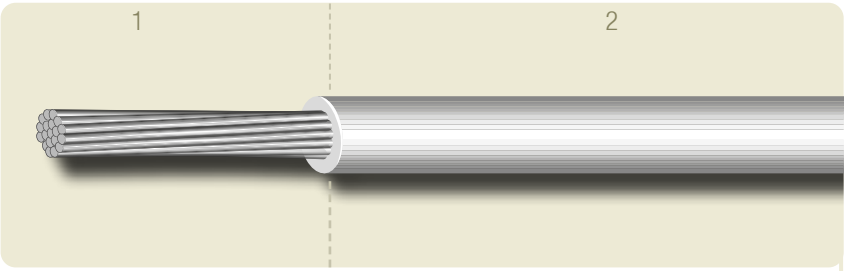
Insulation : extruded POLYIMIDE (TPI) halogen free / LSZH

Operating temperature : -200°C up to +240°C

Voltage rating : 250 VAC

Radiation resistance : 20 MGy (2000 Mrad) in standard atmosphere, 70 MGy (7000 Mrad) in inert atmosphere.

Standard colour : natural (amber).



Construction

PRIMARY WIRE

1 - Conductor : nickel plated annealed copper (NPC) or nickel plated copper alloy (NCA)

2 - Insulation : extruded Polyimide (TPI)

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
AT 3007 NCA	30	7 x 0.102	0.304	0.057	37	0.62	0.84
AT 3001 NCA	30	1 x 0.254	0.254	0.051	39	0.56	0.72
AT 2807 NCA	28	7 x 0.127	0.381	0.089	23	0.70	1.20
AT 2801 NCA	28	1 x 0.320	0.320	0.080	26	0.65	1.10
AT 2619 NPC	26	19 x 0.102	0.504	0.16	12	0.82	2.00
AT 2601 NPC	26	1 x 0.404	0.404	0.13	13	0.72	1.50
AT 2419 NPC	24	19 x 0.127	0.634	0.24	7.6	0.95	2.80
AT 2401 NPC	24	1 x 0.511	0.511	0.20	8.4	0.83	2.30
AT 2219 NPC	22	19 x 0.160	0.800	0.38	4.7	1.13	4.20
AT 2201 NPC	22	1 x 0.643	0.643	0.32	5.3	0.95	4.00
AT 2019 NPC	20	19 x 0.203	1.009	0.616	3.2	1.33	6.50
AT 2001 NPC	20	1 x 0.812	0.812	0.52	3.3	1.13	5.30
AT 1819 NPC	18	19 x 0.254	1.269	0.96	2.1	1.61	10.00
AT 1619 NPC	16	19 X 0.300	1.500	1.34	1.4	1.87	14.00

OTHER CONSTRUCTIONS ON REQUEST

NPC : NICKEL PLATED ANNEALED COPPER - NCA : NICKEL PLATED COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE A xxxx NPC or NCA

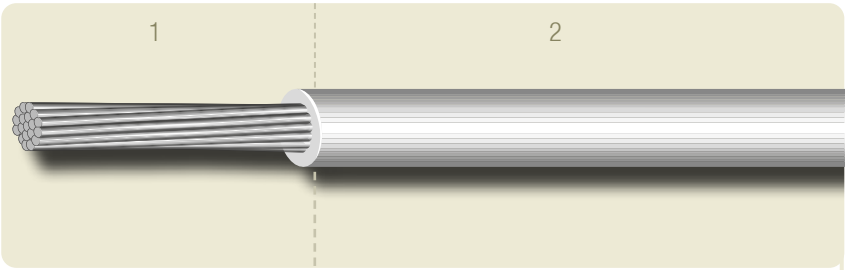
Insulation : extruded POLYIMIDE (TPI) halogen free / LSZH

Operating temperature : -200°C up to +240°C

Voltage rating : 600 VAC

Radiation resistance : 20 MGy (2000 Mrad) in standard atmosphere, 70 MGy (7000 Mrad) in inert atmosphere.

Standard colour : natural (amber).



Construction

PRIMARY WIRE

1 - Conductor : nickel plated annealed copper (NPC) or nickel plated copper alloy (NCA)

2 - Insulation : extruded Polyimide (TPI)

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	NOMINAL RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
A 3007 NCA	30	7 x 0.102	0.303	0.057	37	0.80	1.10
A 3001 NCA	30	1 x 0.254	0.254	0.051	39	0.76	1.00
A 2807 NCA	28	7 x 0.127	0.381	0.089	23	0.90	1.50
A 2801 NCA	28	1 x 0.320	0.320	0.080	26	0.82	1.30
A 2619 NPC	26	19 x 0.102	0.504	0.16	12	1.00	2.20
A 2601 NPC	26	1 x 0.404	0.404	0.13	13	0.90	1.80
A 2419 NPC	24	19 x 0.127	0.634	0.24	7.6	1.15	3.20
A 2401 NPC	24	1 x 0.511	0.511	0.20	8.4	1.05	2.70
A 2219 NPC	22	19 x 0.160	0.800	0.38	4.7	1.30	4.60
A 2201 NPC	22	1 x 0.643	0.643	0.32	5.3	1.15	3.40
A 2019 NPC	20	19 x 0.203	1.009	0.61	3.2	1.50	7.00
A 2001 NPC	20	1 x 0.812	0.812	0.52	3.3	1.30	5.70
A 1819 NPC	18	19 x 0.254	1.269	0.96	2.1	1.75	10.40
A 1619 NPC	16	19 x 0.300	1.500	1.34	1.4	2.10	14.80
A 1419 NPC	14	19 x 0.361	1.805	1.94	0.95	2.35	20.40
A 1237 NPC	12	37 x 0.320	2.22	2.98	0.60	2.85	31.20

OTHER CONSTRUCTIONS ON REQUEST

NPC : NICKEL PLATED ANNEALED COPPER - NCA: NICKEL PLATED COPPER ALLOY - LSZH : LOW SMOKE ZERO HALOGEN

Single wires

TYPE R xxxx TPC

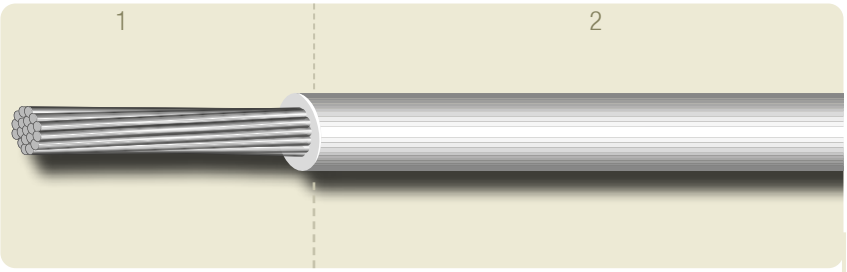
Insulation : THERMOPLASTIC POLYURETHANE (TPU) halogen free / LSZH

Operating temperature : -40°C up to +125°C

Voltage rating : 600 VAC

Radiation resistance : 1 MGy (100 Mrad) in standard atmosphere,
2 MGy (200 Mrad) in inert atmosphere.

Colours : standard colours. See page 12.



Construction

PRIMARY WIRE

1 - Conductor : tin plated annealed copper (TPC)

2 - Insulation : thermoplastic Polyurethane

AXON' REFERENCE	AWG	CONDUCTOR				INSULATED WIRE	
		CONSTRUCTION (Nb x Ø mm)	Ø (mm)	AREA (mm2)	MAX RESISTANCE (Ω/ 100m)	NOMINAL Ø (mm)	WEIGHT (g/m)
R 2237 TPC	22	37 x 0.114	0.78	0.38	5.08	2.30	8.50
R 2037 TPC	20	37 x 0.142	0.97	0.59	3.37	2.50	11.00
R 1861 TPC	18	61 x 0.142	1.24	0.97	2.05	2.80	15.60
R 1661 TPC	16	61 x 0.160	1.45	1.23	1.56	3.00	18.80
R 1461 TPC	14	61 x 0.203	1.75	1.91	1.04	3.30	26.00
R 1291 TPC	12	91 x 0.203	2.15	2.94	0.68	3.70	36.70
R 1091 TPC	10	91 x 0.254	2.70	4.46	0.43	4.30	53.30
R 8133 TPC	8	133 x 0.287	4.20	8.60	0.23	5.80	100.50

(*) LSZH = Low Smoke Zero Halogen - TPC : TIN PLATED ANNEALED COPPER

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