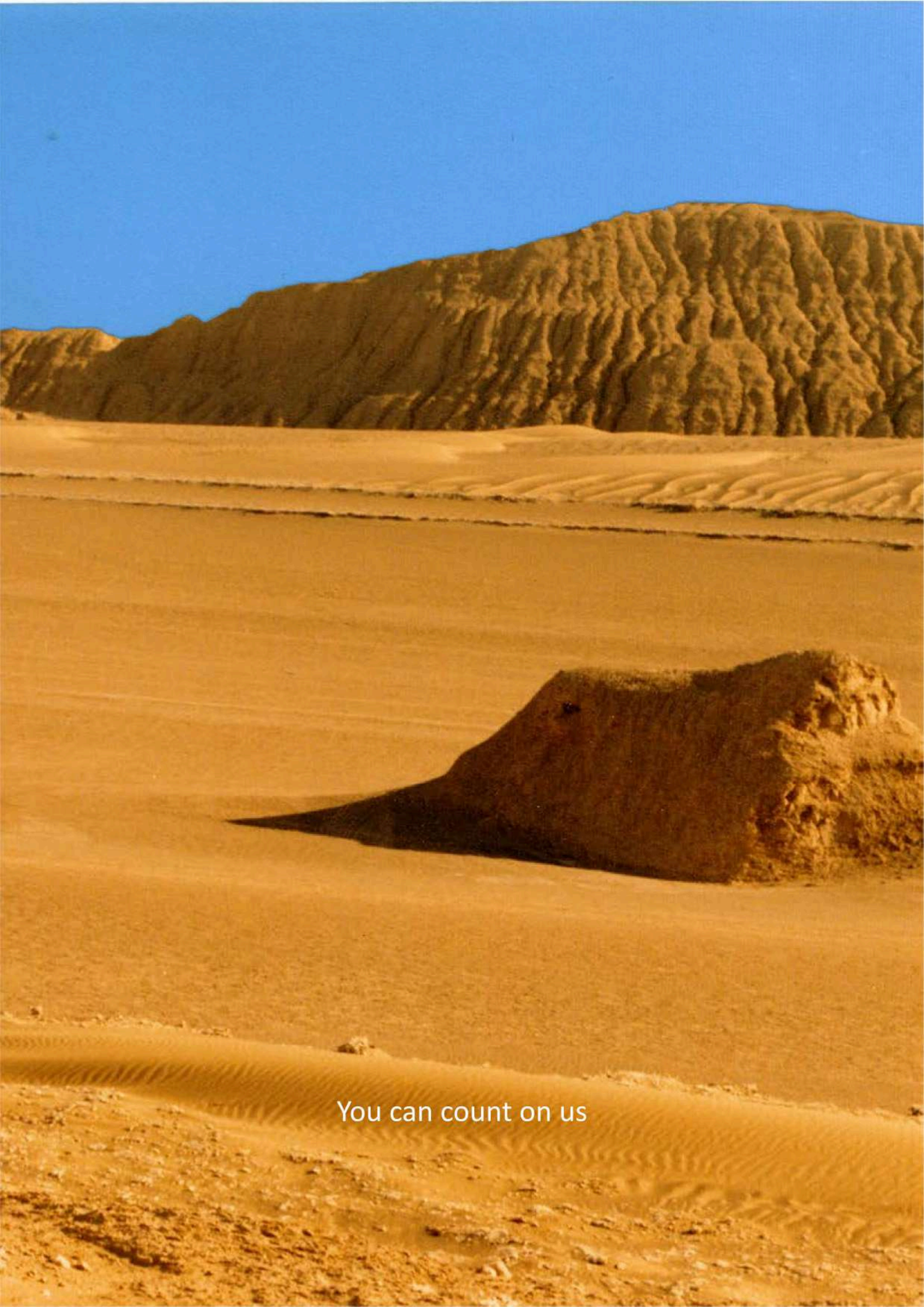
Zarsim Marine Cables

Where do you want to go today?


Success is a choice


A leap ahead


You can count on us

Where vision gets built

About us

Zarsim's mission is survival while maintaining quality. We believe that qualitative and quantitative improvement, dynamism and proper investment in manpower and machinery are the requisites of such a mission. The 10000 square meter facility with a minimum monthly production capacity of eighty million meters of different cables, Zarsim produces various types including low voltage power cables, control cables, instrumentation cables, telecommunication cables, coaxial cables, audio cables and specialty cables. In order to meet the extended needs of customers and to introduce various choices to its production line, Zarsim has been using modern machinery. In the last ten years, Zarsim has continuously developed its operational outlook by providing employee training, modernizing its machinery and improving its core technology. Today, Zarsim is a dynamic and enterprising international corporation truly run by professional management with a modern management structure.

Zarsim Certificates

Products Range

- **Electrical Cables** (300/500 V, 450/750 V & 0.6/1 kV)
  - Power Cable
    - CU/PVCor XLPE/PVC (NYY)(N2XY)
    - CU/PVC/CWS/PVC (NYCY)
    - CU/PVC/CWS/PVC/SWA or SWB /PVC (NYCYRY)
  - Control Cable
    - CU/XLPE/CWS/PVC/DTA/PVC (N2XYBY)
    - CU/MGT/XLPE/LSFOH/SWA/LSFOH (N2XHRH)
- **Instrumentation Cables** (90, 300, 500 V)
  - Digital Cable
    - CU/PVCor XLPE/OSCR/PVC
    - CU/MGT/XLPE, EPR or SIR/ OSCR / LSFOH
    - CU/MGT/XLPE, EPR or SIR/OSCR/LSFOH/SWA or SWB / LSFOH
  - Analog Cable
    - CU/PVCor XLPE/ISCR/OSCR/PVC
    - CU/MGT/XLPE, EPR or SIR/ISCR/OSCR/PVC
    - CU/MGT/XLPE or EPR or SIR/ISCR/OSCR/LSFOH/SWA or SWB/LSFOH
- **Marine, shipboard Cables**
  - Power Cable → TI, TIOI, TICI, TIPI, TFOI, BI, BIOI, BICI
  - Instrumentation Cable → TI(i&c), TIOI(i&c), TICI(i&c), TIPI(i&c), TFOI(i&c), BI(i&c), BIOI(i&c), BICI(i&c)
- **Automotive Cables**
  - Cable Single core → AV, AVS, AVSS,CAVS ,CAVUS ,EB ,HDEB, T2 & T3
  - Shielded Cable → AVSS-AMS, AVSSSB, AVSSSW, T2-AMS & T3-AMS
- **Data Cables**
  - Telecommunication Cable → J-Y(St)Y, J-2Y(St)Y, A-2Y(St)2Y
  - Coaxial Cable → 2.5C 2V, 3C 2V, 4.5C 2V, RG6/U, RG-11/U, RG-58/U & RG-59/U
- **Special Cables**
  - Fire resistant Cable
  - Flat cable
  - Nylon (Polyamide) jacketed Cable → THWN & THHN
  - Offshore & marine Cable

List of Contents

Rubber cables, other constructions and customised solutions are available according to international standards upon customer request.

Shoud you have any questions, including inquiries about detailed prouduct specifications or performance, please ask our sales department.

We are happy to prepare cable in addition to those introduced here to meet specific customer needs. Please contact us for details.

In the interest of quality improvement, specifications are subject to change without notice.

Shipboard Marine Cables

Shipboard Marine Cables

Shipboard Marine Cables, are used for the power, control, instrumentation, and communications inside various ships. These cables have been approved by a classification society. They have a construction that follows standards for marine cables.

Conductor

Annealed copper in accordance with IEC 60228:
Class 2: Rigid conductors with 7 wire formation (in small sections) or concentric layers in big cross sections
Class 5: Flexible conductors bunched or multi-bunched configurations
In general those of class 2 are used, but the use of class 5 is growing, due to their handleability and therefore their greater ease of installation. In offshore industry, tin plated conductor is used to offer greater protection of connections against oxidation in heavy marine environments.

Insulation Material

XLPE (cross-linked polyethylene) is used as the main insulation material. It withstands higher temperatures than ordinary thermoplastic polyethylene. It is resistant against deformation and various chemicals. It has excellent mechanical and electrical properties. The maximum conductor temperature stipulated by IEC 60092-360 marine cable standard is 90 ˚C. There are some other material types such as EPR, HEPR, HF 90 (cross-linked polyolefin) and S 95 (silicone rubber).

Sheathing Material

The sheath (jacket) is composed of halogen free, flame retardant thermoplastic compound. It fulfills the criterion of SHF1 according to IEC 60092-360. In case of fire the sheathing material offers advantages such as reduced emission of smoke and corrosive toxic gasses. There are some other material types such as PVC, SE (PCP), SH (CSP or CPE) and SHF2 (cross-linked polyolefin).

Braid Armouring

The armouring material can be plain or tinned copper wire, galvanised steel wire and phosphor bronze wire. The armour gives the cable mechanical protection. The use of copper in the armour performs a dual function as it behaves as armour but also as a screen.

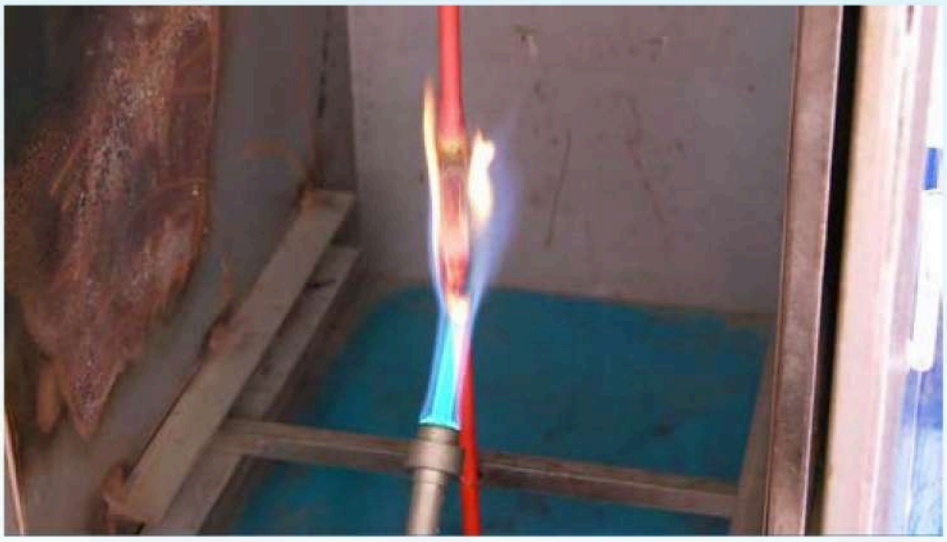
Quality Control

Each manufactured cable goes through a test procedure according to the IEC 60092-300 series standards.

Shipboard Marine Cables

Fire Testing Methods

Flame retardance of a single cable is tested in accordance with IEC 60332-1-2. It is performed on a 60 cm cable sample with a gas flame for 1-8 min depending on the cable diameter. The cable has to be self-extinguishing within certain limits to fulfill the test. Please see figure 1.

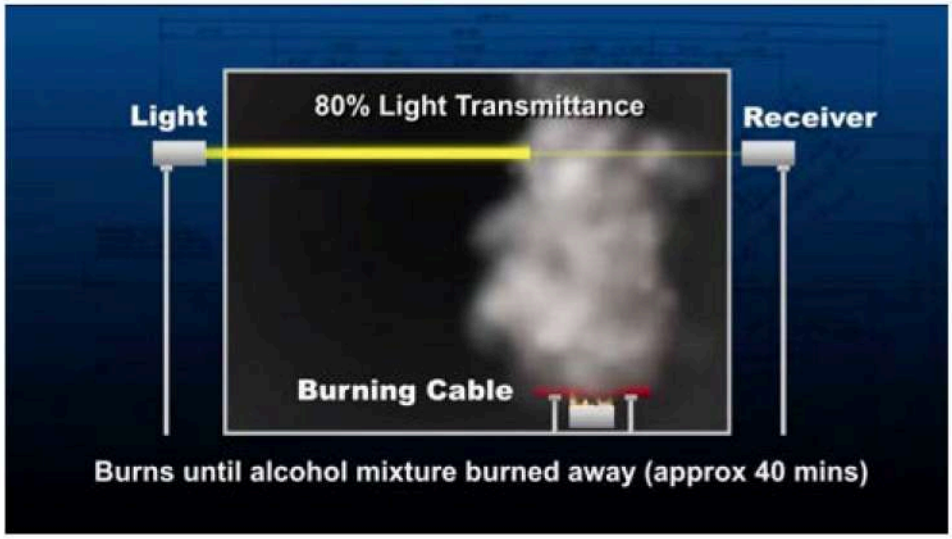


Flame spread is tested on bunched cables in accordance with IEC 60332-3-22, simulating the fire behaviour of the cables installed in a bunch. The main category that is used is A. This is based on an amount of 7 liters of combustible material per meter. The bunch of cables has to be minimum 3.5 m high when it is in a test chamber subjected to fire from a burner directed at the cables for forty minutes. The cable bunch may not burn more than 2.5 m above the burner. Please see figure 2.

Fire resistance tests are aimed at verifying the circuit integrity behaviour of a cable under fire conditions. The main three different test methods are IEC 60331-21 or IEC 60331-1 or IEC 60331-2, used for power and control cables. Marine cable standards require the IEC 60331-21 test, where the cable sample is subjected to a flame at 750 ˚C for 90 minutes followed by a 15 minutes cooling period while the rated voltage is being

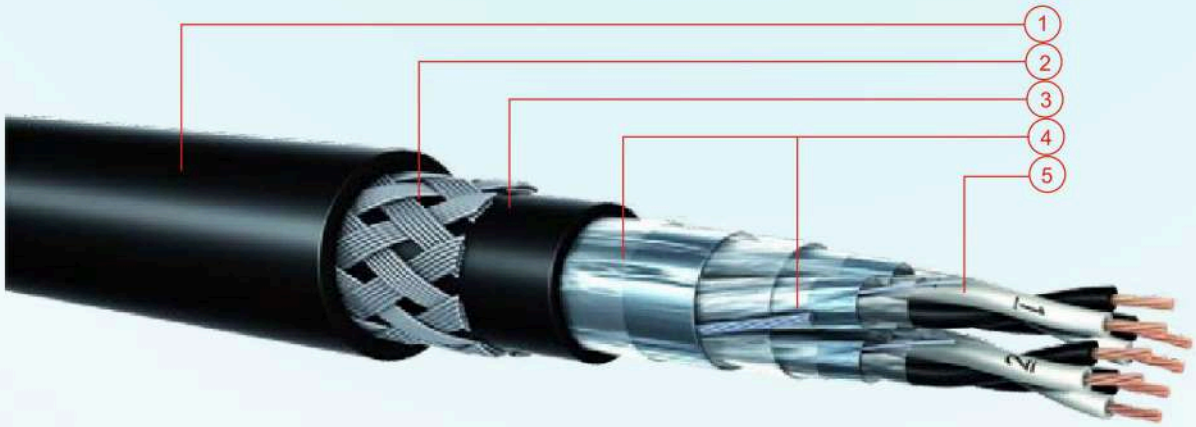
applied between the conductors. No breakdown or short circuit is permitted during the test. Please see figure 3. The optional test methods for cables with diameters over 20 mm, is the more rigorous IEC 60331-1 test, or for diameter not exceeding 20 mm IEC 60331-2, in which a bent cable, affected by mechanical shock, is subjected to a 830 ˚C flame for minimum 90 minutes.

Smoke density is tested according to IEC 61034-1 (apparatus) and IEC 61034-2 (procedure and requirements). It is done by placing cable in a "smoke cube" (3mx3mx3 m). When the cable is burning, the light transmittance is measured using a photometric system. This test is aimed at simulating visibility when cables are burning on board a ship 60 % (70 % for a single cable) visibility is satisfactory if it is attained throughout the test. Please see figure 4.



Halogens. To test whether a material is halogen free or not, the tests IEC 60754-1 and 60754-2 are used. The acidity of the gasses from burning materials is measured. Being halogen-free, means that the materials used in the cables do not contain any halogens, such as chlorine, bromine, iodine and fluorine. In order to attain the self-extinguishing effects that halogens have
in cables, ATH (aluminium trihydroxide) based materials are used instead. By this way, the negative effects of halogens are avoided (corrosivity, toxicity etc.)

Code designation



	Construction	Letter	Meaning	Remarks
1st	Insulation	B	Fire resistant & Flame retardant cables	IEC 60331 & IEC 60332-3 Cat. A)
		R	Flame retardant rubber compound	IEC 60332-3 Cat. A
		T	Flame retardant XLPE/XLPO compound	IEC 60332-3 Cat. A
		U	Halogen free thermoset compound	IEC 60092-360 SHF2
2nd	Inner covering (Inner sheath)	F	Bedding or taping	
		I	Thermoplastic compound	IEC 60092-360 SHF1
3rd	Armour	O	Copper wire braid	
		C	Galvanised steel wire braid	
		X	No armour	
4th	Outer sheath	B	Mud resistantt ype	IEC 60092-360 SE1
		I	Thermoplastic compound	IEC 60092-360 SHF1
		U	Halogen free thermoset compound	IEC 60092-360 SHF2
5th	Screen	(i)	Individual screen	
		(c)	Collective screen	
		(i/c)	Individual & collective screen	

Group 1
Power and Control Cable

TI 0.6/1 kV
Unarmoured Power and Control Cable

Cu/XLPE/HF
Max. conductor temperature: 90°C

Application:

- Used in the ships for control, general power and lighting. Also can be used for indoor and outdoor applications

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Fillers (if any)	Based on halogen free material
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

TI 0.6/1 kV

Unarmoured Power and Control Cable

Cu/XLPE/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	1.6	0.7	1.0	5 ± 0.5	12.1	40
1 x 2.5	2.0	0.7	1.0	5.4 ± 0.5	7.41	60
1 x 4	2.5	0.7	1.0	5.9 ± 0.5	4.61	65
1 x 6	3.1	0.7	1.0	6.5 ± 0.5	3.08	95
1 x 10	4.0	0.7	1.0	7.4 ± 0.5	1.83	135
1 x 16	5.0	0.7	1.1	8.6 ± 0.5	1.15	200
1 x 25	6.3	0.9	1.1	10.3 ± 0.8	0.727	310
1 x 35	7.5	0.9	1.2	11.7 ± 0.8	0.542	410
1 x 50	8.7	1.0	1.2	13.1 ± 0.8	0.387	530
1 x 70	10.5	1.1	1.3	15.3 ± 0.8	0.268	750
1 x 95	12.4	1.1	1.4	17.4 ± 0.8	0.193	1000
1 x 120	14.0	1.2	1.5	19.4 ± 0.8	0.153	1280
1 x 150	16.0	1.4	1.5	21.4 ± 1	0.124	1550
1 x 185	17.8	1.6	1.6	23.9 ± 1	0.099	1910
1 x 240	20.3	1.7	1.8	26.7 ± 1	0.075	2510
1 x 300	22.9	1.8	1.9	29.9 ± 1	0.060	3115
2 x 1.5	1.6	0.7	1.0	8 ± 0.5	12.1	75
2 x 2.5	2.0	0.7	1.1	9 ± 0.5	7.41	100
2 x 4	2.5	0.7	1.1	10 ± 0.8	4.61	145
2 x 6	3.1	0.7	1.2	11.4 ± 0.8	3.08	195
2 x 10	4.0	0.7	1.2	13.2 ± 0.8	1.83	290
2 x 16	5.0	0.7	1.3	15.4 ± 0.8	1.15	435
2 x 25	6.3	0.9	1.5	19.5 ± 0.8	0.727	690
2 x 35	7.5	0.9	1.6	22.0 ± 1	0.542	930

TI 0.6/1 kV
Unarmoured Power and Control Cable

Cu/XLPE/HF
Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
3 x 1.5	1.6	0.7	1.1	8.7 ± 0.5	12.1	100
3 G 1.5	1.6	0.7	1.1	8.7 ± 0.5	12.1	100
3 x 2.5	2.0	0.7	1.1	9.5 ± 0.5	7.41	130
3 G 2.5	2.0	0.7	1.1	9.5 ± 0.5	7.41	130
3 x 4	2.5	0.7	1.1	10.6 ± 0.8	4.61	190
3 x 6	3.1	0.7	1.2	12.1 ± 0.8	3.08	250
3 x 10	4.0	0.7	1.3	14.3 ± 0.8	1.83	390
3 x 16	5.0	0.7	1.4	16.6 ± 0.8	1.15	590
3 x 25	6.3	0.9	1.5	20.5 ± 1	0.727	940
3 x 35	7.5	0.9	1.6	23.3 ± 1	0.542	1150
3 x 50	8.7	1.0	1.7	27.0 ± 1	0.387	1650
3 x 70	10.5	1.1	1.9	31.5 ± 1	0.268	2390
3 x 95	12.4	1.1	2.1	36.0 ± 1.2	0.193	3260
4 x 1.5	1.6	0.7	1.1	9.5 ± 0.5	12.1	120
4 G 1.5	1.6	0.7	1.1	9.5 ± 0.5	12.1	120
4 x 2.5	2.0	0.7	1.1	10.4 ± 0.8	7.41	165
4 G 2.5	2.0	0.7	1.1	10.4 ± 0.8	7.41	165
4 x 4	2.5	0.7	1.2	11.8 ± 0.8	4.61	250
4 G 4	2.5	0.7	1.2	11.8 ± 0.8	4.61	250
4 x 6	3.1	0.7	1.2	13.3 ± 0.8	3.08	330
4 G 6	3.1	0.7	1.2	13.3 ± 0.8	3.08	330
4 x 10	4.0	0.7	1.3	15.7 ± 0.8	1.83	515
4 x 16	5.0	0.7	1.4	18.3 ± 0.8	1.15	780
4 x 25	6.3	0.9	1.6	23.0 ± 1	0.727	1240
4 x 35	7.5	0.9	1.7	26.1 ± 1	0.542	1650
4 x 50	8.7	1.0	1.9	30.1 ± 1	0.387	2210
4 x 70	10.5	1.1	2.0	35.1 ± 1.2	0.268	3140

TI 0.6/1 kV

Unarmoured Power and Control Cable

Cu/XLPE/HF

Max. conductor temperature: 90°C

Range and dimensions

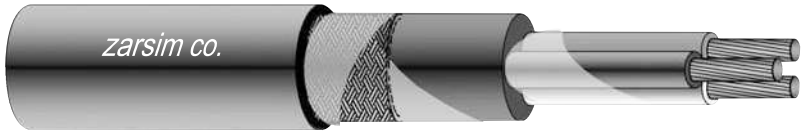
Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
5 x 1.5	1.6	0.7	1.1	10.3 ± 0.8	12.1	150
5 x 2.5	2.0	0.7	1.2	11.6 ± 0.8	7.41	210
5 x 6	3.1	0.7	1.3	15.0 ± 0.8	3.08	400
5 x 16	5.0	0.7	1.5	20.5 ± 1	1.15	920
6 x 1.5	1.6	0.7	1.2	11.4 ± 0.8	12.1	170
7 x 1.5	1.6	0.7	1.2	11.4 ± 0.8	12.1	190
8 x 1.5	1.6	0.7	1.2	12.8 ± 0.8	12.1	220
10 x 1.5	1.6	0.7	1.2	14.6 ± 0.8	12.1	290
12 x 1.5	1.6	0.7	1.3	15.1 ± 0.8	12.1	330
16 x 1.5	1.6	0.7	1.4	16.9 ± 0.8	12.1	410
19 x 1.5	1.6	0.7	1.4	17.8 ± 0.8	12.1	475
24 x 1.5	1.6	0.7	1.5	21.0 ± 1	12.1	620
27 x 1.5	1.6	0.7	1.5	21.7 ± 1	12.1	675
37 x 1.5	1.6	0.7	1.6	24.3 ± 1	12.1	890
6 x 2.5	2.0	0.7	1.2	12.4 ± 0.8	7.41	240
7 x 2.5	2.0	0.7	1.2	12.8 ± 0.8	7.41	270
8 x 2.5	2.0	0.7	1.3	14.0 ± 0.8	7.41	320
10 x 2.5	2.0	0.7	1.3	15.9 ± 0.8	7.41	400
12 x 2.5	2.0	0.7	1.4	17.1 ± 0.8	7.41	470
16 x 2.5	2.0	0.7	1.4	19.0 ± 0.8	7.41	600
19 x 2.5	2.0	0.7	1.5	20.1 ± 1	7.41	700
24 x 2.5	2.0	0.7	1.6	23.7 ± 1	7.41	890
27 x 2.5	2.0	0.7	1.6	24.2 ± 1	7.41	990
37 x 2.5	2.0	0.7	1.8	27.5 ± 1	7.41	1300

TFOI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C



Application:

- Used in the ships for control, general power and lighting, where protection is required. Also can be used for indoor and outdoor applications

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Bedding	Flame retardant halogen free polyolefin compound, extruded or lapped
Armour	Plain or tinned copper wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

TFOI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	1.6	0.7	0.4	0.2	1.0	6.4 ± 0.5	12.1	65
1 x 2.5	2.0	0.7	0.4	0.2	1.0	6.8 ± 0.5	7.41	75
1 x 4	2.5	0.7	0.4	0.2	1.0	7.3 ± 0.5	4.61	95
1 x 6	3.1	0.7	0.4	0.2	1.0	7.8 ± 0.5	3.08	120
1 x 10	4.0	0.7	0.4	0.2	1.1	9.0 ± 0.5	1.83	170
1 x 16	5.0	0.7	0.4	0.2	1.1	10.0 ± 0.8	1.15	240
1 x 25	6.3	0.9	0.4	0.2	1.2	11.9 ± 0.8	0.727	365
1 x 35	7.5	0.9	0.4	0.2	1.2	13.1 ± 0.8	0.542	470
1 x 50	8.7	1.0	0.4	0.3	1.3	15.1 ± 0.8	0.387	640
1 x 70	10.5	1.1	0.4	0.3	1.4	17.3 ± 0.8	0.268	880
1 x 95	12.4	1.1	0.4	0.3	1.5	19.3 ± 0.8	0.193	1150
1 x 120	14.0	1.2	0.4	0.3	1.5	21.1 ± 1	0.153	1430
1 x 150	16.0	1.4	0.4	0.3	1.6	23.4 ± 1	0.124	1730
1 x 185	17.8	1.6	0.4	0.3	1.7	25.8 ± 1	0.099	2155
1 x 240	20.3	1.7	0.4	0.3	1.8	28.8 ± 1	0.075	2775
1 x 300	22.9	1.8	0.4	0.3	1.9	31.7 ± 1	0.060	3410
2 x 1.5	1.6	0.7	0.4	0.2	1.1	9.6 ± 0.5	12.1	125
2 x 2.5	2.0	0.7	0.4	0.2	1.1	10.4 ± 0.8	7.41	150
2 x 4	2.5	0.7	0.4	0.2	1.2	11.7 ± 0.8	4.61	200
2 x 6	3.1	0.7	0.4	0.2	1.2	12.7 ± 0.8	3.08	260
2 x 10	4.0	0.7	0.4	0.3	1.3	15.2 ± 0.8	1.83	395
2 x 16	5.0	0.7	0.4	0.3	1.4	17.5 ± 0.8	1.15	550
2 x 25	6.3	0.9	0.4	0.3	1.5	21.0 ± 1	0.727	820
2 x 35	7.5	0.9	0.4	0.3	1.6	23.5 ± 1	0.542	1070

TFOI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
3 x 1.5	1.6	0.7	0.4	0.2	1.1	10.1 ± 0.8	12.1	145
3 G 1.5	1.6	0.7	0.4	0.2	1.1	10.1 ± 0.8	12.1	145
3 x 2.5	2.0	0.7	0.4	0.2	1.1	10.9 ± 0.8	7.41	180
3 G 2.5	2.0	0.7	0.4	0.2	1.1	10.9 ± 0.8	7.41	180
3 x 4	2.5	0.7	0.4	0.2	1.2	12.3 ± 0.8	4.61	250
3 x 6	3.1	0.7	0.4	0.2	1.2	13.3 ± 0.8	3.08	320
3 x 10	4.0	0.7	0.4	0.3	1.3	16.1 ± 0.8	1.83	510
3 x 16	5.0	0.7	0.4	0.3	1.4	18.3 ± 0.8	1.15	720
3 x 25	6.3	0.9	0.4	0.3	1.6	22.5 ± 1	0.727	1090
3 x 35	7.5	0.9	0.4	0.3	1.7	25.3 ± 1	0.542	1430
3 x 50	8.7	1.0	0.4	0.3	1.8	28.6 ± 1	0.387	1885
3 x 70	10.5	1.1	0.4	0.3	2.0	33.3 ± 1	0.268	2630
3 x 95	12.4	1.1	0.4	0.4	2.2	38.2 ± 1.2	0.193	3625
4 x 1.5	1.6	0.7	0.4	0.2	1.1	10.8 ± 0.8	12.1	175
4 G 1.5	1.6	0.7	0.4	0.2	1.1	10.8 ± 0.8	12.1	175
4 x 2.5	2.0	0.7	0.4	0.2	1.2	12.0 ± 0.8	7.41	235
4 G 2.5	2.0	0.7	0.4	0.2	1.2	12.0 ± 0.8	7.41	235
4 x 4	2.5	0.7	0.4	0.3	1.3	13.7 ± 0.8	4.61	330
4 G 4	2.5	0.7	0.4	0.3	1.3	13.7 ± 0.8	4.61	330
4 x 6	3.1	0.7	0.4	0.3	1.3	15.1 ± 0.8	3.08	430
4 G 6	3.1	0.7	0.4	0.3	1.3	15.1 ± 0.8	3.08	430
4 x 10	4.0	0.7	0.4	0.3	1.4	17.7 ± 0.8	1.83	645
4 x 16	5.0	0.7	0.4	0.3	1.5	20.2 ± 1	1.15	910
4 x 25	6.3	0.9	0.4	0.3	1.7	24.8 ± 1	0.727	1400
4 x 35	7.5	0.9	0.4	0.3	1.8	27.8 ± 1	0.542	1855
4 x 50	8.7	1.0	0.4	0.3	1.9	31.6 ± 1	0.387	2430
4 x 70	10.5	1.1	0.4	0.4	2.1	37.3 ± 1.2	0.268	3500
5 x 1.5	1.6	0.7	0.4	0.2	1.2	11.9 ± 0.8	12.1	210
6 x 1.5	1.6	0.7	0.4	0.2	1.2	12.5 ± 0.8	12.1	230
7 x 1.5	1.6	0.7	0.4	0.2	1.2	12.8 ± 0.8	12.1	250
8 x 1.5	1.6	0.7	0.4	0.3	1.3	14.6 ± 0.8	12.1	335
10 x 1.5	1.6	0.7	0.4	0.3	1.3	15.9 ± 0.8	12.1	390

TFOI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

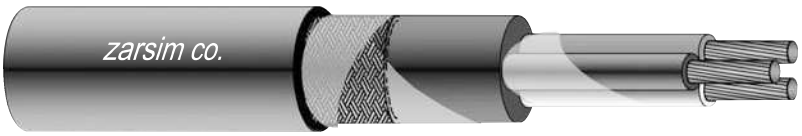
Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
12 x 1.5	1.6	0.7	0.4	0.3	1.4	17.0 ± 0.8	7.41	580
16 x 1.5	1.6	0.7	0.4	0.3	1.4	18.6 ± 0.8	7.41	720
19 x 1.5	1.6	0.7	0.4	0.3	1.5	19.7 ± 0.8	7.41	820
24 x 1.5	1.6	0.7	0.4	0.3	1.6	22.9 ± 1	7.41	1060
27 x 1.5	1.6	0.7	0.4	0.3	1.6	23.4 ± 1	7.41	1150
37 x 1.5	1.6	0.7	0.4	0.3	1.7	26.1 ± 1	7.41	1490
6 x 2.5	2.0	0.7	0.4	0.3	1.2	13.7 ± 0.8	7.41	320
7 x 2.5	2.0	0.7	0.4	0.3	1.3	14.5 ± 0.8	7.41	360
8 x 2.5	2.0	0.7	0.4	0.3	1.4	15.2 ± 0.8	7.41	410
10 x 2.5	2.0	0.7	0.4	0.3	1.4	16.5 ± 0.8	7.41	500
12 x 2.5	2.0	0.7	0.4	0.3	1.4	18.6 ± 0.8	7.41	580
16 x 2.5	2.0	0.7	0.4	0.3	1.5	20.7 ± 1	7.41	720
19 x 2.5	2.0	0.7	0.4	0.3	1.5	21.7 ± 1	7.41	820
24 x 2.5	2.0	0.7	0.4	0.3	1.7	25.5 ± 1	7.41	1060
27 x 2.5	2.0	0.7	0.4	0.3	1.7	26.0 ± 1	7.41	1150
37 x 2.5	2.0	0.7	0.4	0.3	1.8	29.1 ± 1	7.41	1490

TIOI 0.6/1 kV, TICI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C



Application:

- Used in the ships for control, general power and lighting, where protection is required. Also can be used for indoor and outdoor applications

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Fillers (if any)	Based on halogen free material
Inner sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360
Armour	Plain/tinned copper wire braid or galvanised steel wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

TIOI 0.6/1 kV, TICI 0.6/1 kV

Armoured Power and Control Cable

Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner sheath thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 16	5.0	0.7	1.1	0.2	0.8	11.2 ± 0.8	1.15	300
1 x 25	6.3	0.9	1.1	0.3	0.9	13.6 ± 0.8	0.727	440
1 x 35	7.5	0.9	1.2	0.3	0.9	15 ± 0.8	0.542	560
1 x 50	8.7	1.0	1.2	0.3	1.0	16.6 ± 0.8	0.387	700
1 x 70	10.5	1.1	1.3	0.3	1.0	18.8 ± 0.8	0.268	960
1 x 95	12.4	1.1	1.4	0.3	1.1	21.1 ± 1	0.193	1255
1 x 120	14.0	1.2	1.5	0.3	1.1	23.1 ± 1	0.153	1530
1 x 150	16.0	1.4	1.5	0.3	1.2	25.4 ± 1	0.124	1860
1 x 185	17.8	1.6	1.6	0.3	1.2	27.9 ± 1	0.099	2270
1 x 240	20.3	1.7	1.7	0.3	1.3	31.1 ± 1	0.075	2920
1 x 300	22.9	1.8	1.9	0.4	1.4	34.6 ± 1	0.060	3670
2 x 1.5	1.6	0.7	1.0	0.2	0.8	10.6 ± 0.8	12.1	195
2 x 2.5	2.0	0.7	1.1	0.2	0.9	11.8 ± 0.8	7.41	235
2 x 4	2.5	0.7	1.1	0.3	0.9	12.8 ± 0.8	4.61	290
2 x 6	3.1	0.7	1.2	0.3	0.9	14.7 ± 0.8	3.08	350
2 x 10	4.0	0.7	1.2	0.3	1.0	16.7 ± 0.8	1.83	475
2 x 16	5.0	0.7	1.3	0.3	1.0	18.9 ± 0.8	1.15	635
2 x 25	6.3	0.9	1.4	0.3	1.1	22.7 ± 1	0.727	950
2 x 35	7.5	0.9	1.5	0.3	1.2	25.5 ± 1	0.542	1220
3 x 1.5	1.6	0.7	1.1	0.2	0.8	11.3 ± 0.8	12.1	220
3 G 1.5	1.6	0.7	1.1	0.2	0.8	11.3 ± 0.8	12.1	220
3 x 2.5	2.0	0.7	1.1	0.2	0.9	12.3 ± 0.8	7.41	270
3 G 2.5	2.0	0.7	1.1	0.2	0.9	12.3 ± 0.8	7.41	270
3 x 4	2.5	0.7	1.1	0.3	0.9	13.9 ± 0.8	4.61	340
3 G 4	2.5	0.7	1.1	0.3	0.9	13.9 ± 0.8	4.61	340
3 x 6	3.1	0.7	1.2	0.3	0.9	15.4 ± 0.8	3.08	420
3 x 10	4.0	0.7	1.3	0.3	1.0	17.8 ± 0.8	1.83	600
3 x 16	5.0	0.7	1.4	0.3	1.1	20.3 ± 1	1.15	840
3 x 25	6.3	0.9	1.5	0.3	1.2	24.4 ± 1	0.727	1225
3 x 35	7.5	0.9	1.6	0.3	1.2	27.2 ± 1	0.542	1580
3 x 50	8.7	1.0	1.7	0.3	1.3	31.0 ± 1	0.387	2050
3 x 70	10.5	1.1	1.9	0.4	1.4	36.1 ± 1	0.268	2920
3 x 95	12.4	1.1	2.1	0.4	1.6	41.1 ± 0.8	0.193	3880
4 x 1.5	1.6	0.7	1.1	0.2	0.9	12.3 ± 0.8	12.1	250
4 G 1.5	1.6	0.7	1.1	0.2	0.9	12.3 ± 0.8	12.1	250
4 x 2.5	2.0	0.7	1.1	0.3	0.9	13.7 ± 0.8	7.41	310
4 G 2.5	2.0	0.7	1.1	0.3	0.9	13.7 ± 0.8	7.41	310
4 x 4	2.5	0.7	1.2	0.3	0.9	15.1 ± 0.8	4.61	410
4 G 4	2.5	0.7	1.2	0.3	0.9	15.1 ± 0.8	4.61	410
4 x 6	3.1	0.7	1.2	0.3	1.0	16.8 ± 0.8	3.08	510
4 G 6	3.1	0.7	1.2	0.3	1.0	16.8 ± 0.8	3.08	510

TIOI 0.6/1 kV, TICI 0.6/1 kV

Armoured Power and Control Cable

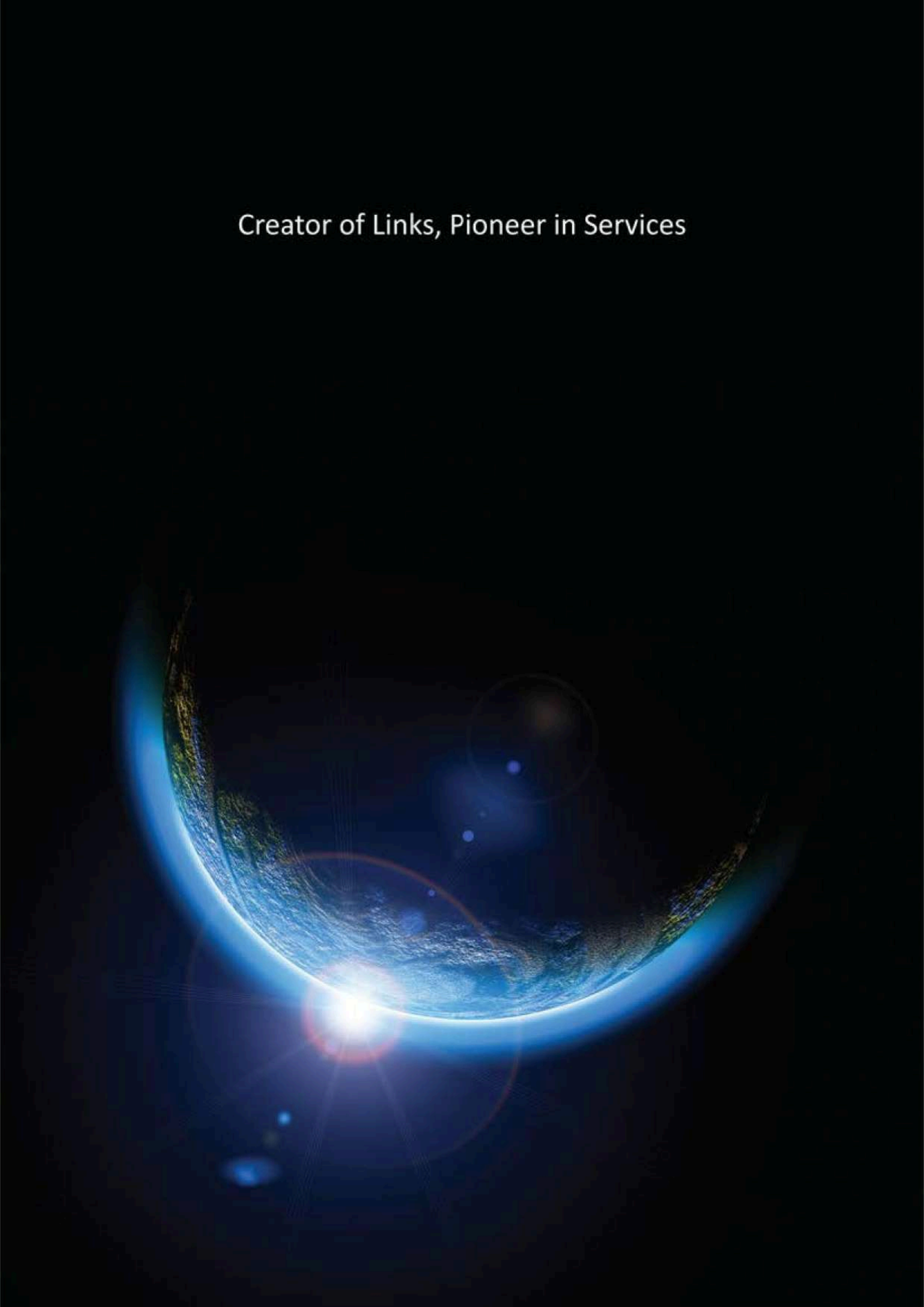
Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner sheath thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	2.0	0.7	1.0	0.2	0.8	8.1 ± 0.5	12.1	110
1 x 2.5	2.0	0.7	1.0	0.2	0.8	8.6 ± 0.5	7.41	120
1 x 4	2.5	0.7	1.0	0.2	0.8	9.4 ± 0.5	4.61	150
1 x 6	3.1	0.7	1.0	0.2	0.8	9.7 ± 0.5	3.08	170
1 x 10	4.0	0.7	1.0	0.2	0.8	10.9 ± 0.8	1.83	240
4 x 10	4.0	0.7	1.3	0.3	1.0	19.2 ± 0.8	1.83	725
4 x 16	5.0	0.7	1.4	0.3	1.1	22.0 ± 1	1.15	1030
4 x 25	6.3	0.9	1.6	0.3	1.2	26.7 ± 1	0.727	1540
4 x 35	7.5	0.9	1.7	0.3	1.3	30.1 ± 1	0.542	2015
4 x 50	8.7	1.0	1.9	0.4	1.4	34.8 ± 1	0.387	2700
4 x 70	10.5	1.1	2.0	0.4	1.5	40 ± 1.2	0.268	3710
5 x 1.5	1.6	0.7	1.1	0.3	0.9	13.6 ± 0.8	12.1	290
6 x 1.5	1.6	0.7	1.2	0.3	0.9	14.7 ± 0.8	12.1	330
7 x 1.5	1.6	0.7	1.2	0.3	0.9	14.7 ± 0.8	12.1	355
8 x 1.5	1.6	0.7	1.2	0.3	1.0	16.3 ± 0.8	12.1	390
10 x 1.5	1.6	0.7	1.3	0.3	1.0	18.1 ± 0.8	12.1	450
12 x 1.5	1.6	0.7	1.3	0.3	1.0	18.6 ± 0.8	12.1	520
16 x 1.5	1.6	0.7	1.4	0.3	1.1	20.6 ± 1	12.1	640
19 x 1.5	1.6	0.7	1.4	0.3	1.1	21.5 ± 1	12.1	710
24 x 1.5	1.6	0.7	1.5	0.3	1.2	25.0 ± 1	12.1	920
27 x 1.5	1.6	0.7	1.5	0.3	1.2	25.4 ± 1	12.1	970
37 x 1.5	1.6	0.7	1.6	0.3	1.2	28.3 ± 1	12.1	1220
5 x 2.5	2.0	0.7	1.2	0.3	0.9	15.2 ± 0.8	7.41	370
6 x 2.5	2.0	0.7	1.2	0.3	1.0	15.7 ± 0.8	7.41	410
7 x 2.5	2.0	0.7	1.2	0.3	1.0	16.2 ± 0.8	7.41	440
8 x 2.5	2.0	0.7	1.3	0.3	1.0	16.7 ± 0.8	7.41	480
10 x 2.5	2.0	0.7	1.3	0.3	1.0	17.7 ± 0.8	7.41	560
12 x 2.5	2.0	0.7	1.4	0.3	1.1	20.6 ± 1	7.41	700
16 x 2.5	2.0	0.7	1.4	0.3	1.1	22.5 ± 1	7.41	845
19 x 2.5	2.0	0.7	1.5	0.3	1.1	23.7 ± 1	7.41	975
24 x 2.5	2.0	0.7	1.6	0.3	1.2	27.5 ± 1	7.41	1220
27 x 2.5	2.0	0.7	1.6	0.3	1.2	28.0 ± 1	7.41	1310
37 x 2.5	2.0	0.7	1.8	0.3	1.3	31.5 ± 1	7.41	1710

Creator of Links, Pioneer in Services



Group 2

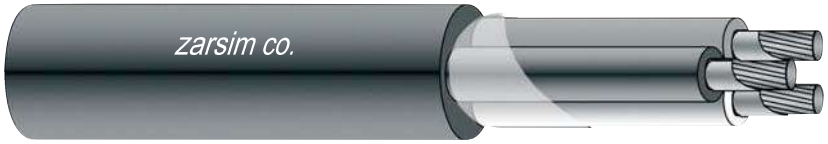
Fire Resistant Power and Control Cable

BI 0.6/1 kV

Unarmoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/HF

Max. conductor temperature: 90°C



Application:

- Used in the ships for alarm, control, general power, emergency and critical systems. Also can be used for indoor and outdoor applications

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60331-21	Fire resistant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Mica tape + halogen free cross-linked polyethylene XLPE, IEC 60092-360
Fillers (if any)	Based on halogen free material
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

BI 0.6/1 kV

Unarmoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	1.6	0.7	1.0	5.4 ± 0.5	12.1	45
1 x 2.5	2.0	0.7	1.0	5.8 ± 0.5	7.41	65
1 x 4	2.5	0.7	1.0	6.3 ± 0.5	4.61	85
1 x 6	3.1	0.7	1.0	6.9 ± 0.5	3.08	100
1 x 10	4.0	0.7	1.0	7.8 ± 0.5	1.83	150
1 x 16	5.0	0.7	1.1	9.0± 0.5	1.15	220
1 x 25	6.3	0.9	1.2	10.9 ± 0.8	0.727	340
1 x 35	7.5	0.9	1.2	12.1 ± 0.8	0.542	435
1 x 50	8.7	1.0	1.3	13.7 ± 0.8	0.387	575
1 x 70	10.5	1.1	1.3	15.7 ± 0.8	0.268	805
1 x 95	12.4	1.1	1.4	17.8 ± 0.8	0.193	1085
1 x 120	14.0	1.2	1.5	19.8 ± 0.8	0.153	1345
1 x 150	16.0	1.4	1.0	22.5 ± 1	0.124	1660
1 x 185	17.8	1.6	1.1	24.9 ± 1	0.099	2060
1 x 240	20.3	1.7	1.1	27.9 ± 1	0.075	2660
1 x 300	22.9	1.8	1.2	29.8 ± 1	0.060	3290
2 x 1.5	1.6	0.7	1.1	9.0± 0.5	12.1	100
2 x 2.5	2.0	0.7	1.1	9.8 ± 0.5	7.41	125
2 x 4	2.5	0.7	1.2	11.6 ± 0.8	4.61	185
2 x 6	3.1	0.7	1.2	12.8 ± 0.8	3.08	230
2 x 10	4.0	0.7	1.3	14.9 ± 0.8	1.83	345
2 x 16	5.0	0.7	1.4	17.1 ± 0.8	1.15	485
2 x 25	6.3	0.9	1.5	20.6 ± 0.8	0.727	755
2 x 35	7.5	0.9	1.6	23.0 ± 0.8	0.542	990
3 x 1.5	1.6	0.7	1.1	9.6 ± 0.5	12.1	125
3 G 1.5	1.6	0.7	1.1	9.6 ± 0.5	12.1	125
3 x 2.5	2.0	0.7	1.1	10.5 ± 0.8	7.41	170
3 G 2.5	2.0	0.7	1.1	10.5 ± 0.8	7.41	170
3 x 4	2.5	0.7	1.2	11.7 ± 0.8	4.61	230
3 x 6	3.1	0.7	1.2	13.0 ± 0.8	3.08	310

BI 0.6/1 kV

Unarmoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
3 x 10	4.0	0.7	1.3	15.2 ± 0.8	1.83	455
3 x 16	5.0	0.7	1.4	17.5 ± 0.8	1.15	665
3 x 25	6.3	0.9	1.6	22.1 ± 1	0.727	1045
3 x 35	7.5	0.9	1.7	24.9 ± 1	0.542	1350
3 x 50	8.7	1.0	1.8	28.6 ± 1	0.387	1820
3 x 70	10.5	1.1	2.0	33.1 ± 1	0.268	2545
3 x 95	12.4	1.1	2.1	37.4 ± 1.2	0.193	3425
4 x 1.5	1.6	0.7	1.1	10.5 ± 0.8	12.1	150
4 G 1.5	1.6	0.7	1.1	10.5 ± 0.8	12.1	150
4 x 2.5	2.0	0.7	1.2	11.6 ± 0.8	7.41	220
4 G 2.5	2.0	0.7	1.2	11.6 ± 0.8	7.41	220
4 x 10	4.0	0.7	1.4	16.9 ± 0.8	1.83	600
4 x 25	6.3	0.9	1.6	23.8 ± 1	0.727	1365
4 x 35	7.5	0.9	1.8	27.1 ± 1	0.524	1800
4 x 50	8.7	1.0	1.3	31.7 ± 1	0.387	2370
4 x 70	10.5	1.1	1.4	36.9 ± 1.2	0.268	3330
5 x 1.5	1.6	0.7	1.2	12.0 ± 0.8	12.1	190
6 x 1.5	1.6	0.7	1.2	12.5 ± 0.8	12.1	230
7 x 1.5	1.6	0.7	1.2	13.0 ± 0.8	12.1	240
8 x 1.5	1.6	0.7	1.3	13.6 ± 0.8	12.1	280
10 x 1.5	1.6	0.7	1.3	14.1 ± 0.8	12.1	350
12 x 1.5	1.6	0.7	1.4	17.4 ± 0.8	12.1	425
16 x 1.5	1.6	0.7	1.5	19.6 ± 0.8	12.1	540
19 x 1.5	1.6	0.7	1.5	20.6 ± 1	12.1	620
24 x 1.5	1.6	0.7	1.6	24.3 ± 1	12.1	810
27 x 1.5	1.6	0.7	1.7	25.0 ± 1	12.1	900
37 x 1.5	1.6	0.7	1.8	28.1 ± 1	12.1	1100

BI 0.6/1 kV

Unarmoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	Ohm/km	kg/km
5 x 2.5	2.0	0.7	1.2	13.4 ± 0.8	7.41	260
6 x 2.5	2.0	0.7	1.2	14.0 ± 0.8	7.41	350
7 x 2.5	2.0	0.7	1.3	14.7 ± 0.8	7.41	340
8 x 2.5	2.0	0.7	1.3	15.6 ± 0.8	7.41	400
10 x 2.5	2.0	0.7	1.4	18.2 ± 0.8	7.41	490
12 x 2.5	2.0	0.7	1.5	19.7 ± 0.8	7.41	600
16 x 2.5	2.0	0.7	1.6	22.1 ± 1	7.41	770
19 x 2.5	2.0	0.7	1.6	23.3 ± 1	7.41	890
24 x 2.5	2.0	0.7	1.8	27.7 ± 1	7.41	1150
27 x 2.5	2.0	0.7	1.8	28.4 ± 1	7.41	1260
37 x 2.5	2.0	0.7	1.9	32.0 ± 1	7.41	1670

BFOI 0.6/1 kV

Armoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/BED/CWB/HF

Max. conductor temperature 90°C

Application:

- Used in the ships for alarm, control, general power, emergency and critical systems, where protection is required. Also can be used for indoor and outdoor applications.

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60331-21	Fire resistant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Mica tape + halogen free cross-linked polyethylene XLPE, IEC 60092-360
Bedding	Flame retardant halogen free polyolefin compound, extruded or lapped
Armour	Plain or tinned copper wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

BFOI 0.6/1 kV

Armoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/BED/CWB/HF

Max. conductor temperature 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
3 x 1.5	1.6	0.7	0.4	0.2	1.2	11.3 ± 0.8	12.1	180
3 G 1.5	1.6	0.7	0.4	0.2	1.2	11.3 ± 0.8	12.1	180
3 x 2.5	2.0	0.7	0.4	0.2	1.2	12.4 ± 0.8	7.41	230
3 G 2.5	2.0	0.7	0.4	0.2	1.2	12.4 ± 0.8	7.41	230
3 x 4	2.5	0.7	0.4	0.3	1.3	14.0 ± 0.8	4.61	320
3 x 6	3.1	0.7	0.4	0.3	1.3	15.3 ± 0.8	3.08	400
3 x 10	4.0	0.7	0.4	0.3	1.4	17.5 ± 0.8	1.83	570
3 x 16	5.0	0.7	0.4	0.3	1.5	20.0 ± 1	1.15	800
3 x 25	6.3	0.9	0.4	0.3	1.6	23.8 ± 1	0.727	1190
3 x 35	7.5	0.9	0.4	0.3	1.7	26.4 ± 1	0.542	1540
3 x 50	8.7	1.0	0.4	0.3	1.9	30.2 ± 1	0.387	2010
3 x 16	5.0	0.7	0.4	0.3	1.5	20.0 ± 1	1.15	800
3 x 25	6.3	0.9	0.4	0.3	1.6	23.8 ± 1	0.727	1190
3 x 35	7.5	0.9	0.4	0.3	1.7	26.4 ± 1	0.542	1540
3 x 50	8.7	1.0	0.4	0.3	1.9	30.2 ± 1	0.387	2010
3 x 70	10.5	1.1	0.4	0.3	2.0	34.8 ± 1	0.268	2770
3 x 95	12.4	1.1	0.4	0.4	2.2	39.7 ± 1.2	0.193	3780
4 x 1.5	1.6	0.7	0.4	0.2	1.2	12.2 ± 0.8	12.1	210
4 G 1.5	1.6	0.7	0.4	0.2	1.2	12.2 ± 0.8	12.1	210
4 x 2.5	2.0	0.7	0.4	0.3	1.3	14.0 ± 0.8	7.41	300
4 G 2.5	2.0	0.7	0.4	0.3	1.3	14.0 ± 0.8	7.41	300
4 x 4	2.5	0.7	0.4	0.3	1.3	15.1 ± 0.8	4.61	390
4 G 4	2.5	0.7	0.4	0.3	1.3	15.1 ± 0.8	4.61	390
4 x 6	3.1	0.7	0.4	0.3	1.4	16.8 ± 0.8	3.08	500
4 G 6	3.1	0.7	0.4	0.3	1.4	16.8 ± 0.8	3.08	500
4 x 10	4.0	0.7	0.4	0.3	1.5	19.3 ± 0.8	1.83	710
4 x 16	5.0	0.7	0.4	0.3	1.5	21.7 ± 1	1.15	1000
4 x 25	6.3	0.9	0.4	0.3	1.7	26.2 ± 1	0.727	1520
4 x 35	7.5	0.9	0.4	0.3	1.8	29.1 ± 1	0.542	1980
4 x 50	8.7	1.0	0.4	0.3	2.0	33.4 ± 1	0.387	2600
4 x 70	10.5	1.1	0.4	0.4	2.2	39.1 ± 1.2	0.268	3690

BFOI 0.6/1 kV

Armoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/BED/CWB/HF

Max. conductor temperature 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	1.6	0.7	0.4	0.2	1.0	6.9 ± 0.5	12.1	75
1 x 2.5	2.0	0.7	0.4	0.2	1.0	7.4 ± 0.5	7.41	90
1 x 4	2.5	0.7	0.4	0.2	1.0	7.9 ± 0.5	4.61	115
1 x 6	3.1	0.7	0.4	0.2	1.1	8.6 ± 0.5	3.08	145
1 x 10	4.0	0.7	0.4	0.2	1.1	9.7 ± 0.5	1.83	190
1 x 16	5.0	0.7	0.4	0.2	1.1	10.7 ± 0.8	1.15	255
1 x 25	6.3	0.9	0.4	0.2	1.2	12.5 ± 0.8	0.727	390
1 x 35	7.5	0.9	0.4	0.3	1.3	14.1 ± 0.8	0.542	530
1 x 50	8.7	1.0	0.4	0.3	1.3	15.7 ± 0.8	0.387	670
1 x 70	10.5	1.1	0.4	0.3	1.4	17.8 ± 0.8	0.268	910
1 x 95	12.4	1.1	0.4	0.3	1.5	20.0 ± 1	0.193	1200
1 x 120	14.0	1.2	0.4	0.3	1.6	22.0 ± 1	0.153	1490
1 x 150	16.0	1.4	0.4	0.3	1.6	24.0 ± 1	0.124	1800
1 x 185	17.8	1.6	0.4	0.3	1.7	26.5 ± 1	0.099	2220
1 x 240	20.3	1.7	0.4	0.3	1.8	29.6 ± 1	0.075	2830
1 x 300	22.9	1.8	0.4	0.3	1.9	32.3 ± 1	0.060	3500
2 x 1.5	1.6	0.7	0.4	0.2	1.1	10.6 ± 0.8	12.1	150
2 x 2.5	2.0	0.7	0.4	0.2	1.2	11.8 ± 0.8	7.41	190
2 x 4	2.5	0.7	0.4	0.2	1.2	12.8 ± 0.8	4.61	230
2 x 6	3.1	0.7	0.4	0.3	1.3	14.5 ± 0.8	3.08	320
2 x 10	4.0	0.7	0.4	0.3	1.4	16.5 ± 0.8	1.83	450
2 x 16	5.0	0.7	0.4	0.3	1.4	18.7 ± 0.8	1.15	610
2 x 25	6.3	0.9	0.4	0.3	1.6	22.5 ± 1	0.727	900
2 x 35	7.5	0.9	0.4	0.3	1.7	24.9 ± 1	0.542	1150

BFOI 0.6/1 kV

Armoured Fire Resistant Power and Control Cable

Cu/MGT/XLPE/BED/CWB/HF

Max. conductor temperature 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
5 x 1.5	1.6	0.7	0.4	0.2	1.2	13.2 ± 0.8	12.1	250
6 x 1.5	1.6	0.7	0.4	0.3	1.2	14.0 ± 0.8	12.1	290
7 x 1.5	1.6	0.7	0.4	0.3	1.3	14.8 ± 0.8	12.1	340
8 x 1.5	1.6	0.7	0.4	0.3	1.3	15.6 ± 0.8	12.1	390
10 x 1.5	1.6	0.7	0.4	0.3	1.4	17.6 ± 0.8	12.1	450
12 x 1.5	1.6	0.7	0.4	0.3	1.4	19.0 ± 0.8	12.1	540
16 x 1.5	1.6	0.7	0.4	0.3	1.5	21.2 ± 1	12.1	680
19 x 1.5	1.6	0.7	0.4	0.3	1.6	22.3 ± 1	12.1	780
24 x 1.5	1.6	0.7	0.4	0.3	1.7	26.0 ± 1	12.1	990
27 x 1.5	1.6	0.7	0.4	0.3	1.7	26.5 ± 1	12.1	1060
37 x 1.5	1.6	0.7	0.4	0.3	1.8	29.8 ± 1	12.1	1380
5 x 2.5	2.0	0.7	0.4	0.3	1.3	15.0 ± 0.8	7.41	360
6 x 2.5	2.0	0.7	0.4	0.3	1.3	15.6 ± 0.8	7.41	400
7 x 2.5	2.0	0.7	0.4	0.3	1.3	16.3 ± 0.8	7.41	440
8 x 2.5	2.0	0.7	0.4	0.3	1.4	16.8 ± 0.8	7.41	480
10 x 2.5	2.0	0.7	0.4	0.3	1.4	17.8 ± 0.8	7.41	550
12 x 2.5	2.0	0.7	0.4	0.3	1.5	21.3 ± 1	7.41	720
16 x 2.5	2.0	0.7	0.4	0.3	1.6	23.7 ± 1	7.41	910
19 x 2.5	2.0	0.7	0.4	0.3	1.7	25.0 ± 1	7.41	1050
24 x 2.5	2.0	0.7	0.4	0.3	1.8	29.2 ± 1	7.41	1340
27 x 2.5	2.0	0.7	0.4	0.3	1.8	29.8 ± 1	7.41	1440
37 x 2.5	2.0	0.7	0.4	0.3	2.0	33.7 ± 1	7.41	1900

BIOI 0.6/1 kV, BICI 0.6/1 kV Cu/MGT/XLPE/HF/CWB or SWB/HF

Armoured Fire Resistant Power and Control Cable

Max conductor temperature: 90°C

Application:

- Used in the ships for alarm, control, general power, emergency and critical systems, where protection is required. Also can be used for indoor and outdoor applications.

Standard:

IEC 60092-353	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60331-21	Fire resistant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Mica tape + halogen free cross-linked polyethylene XLPE, IEC 60092-360
Fillers (if any)	Based on halogen free material
Inner sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360
Armour	Plain/tinned copper wire braid or galvanised steel wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Core identification:

1 core	Black
2 cores	Blue - Brown
3 cores	Black - Brown - Grey
4 cores	Black - Blue - Brown - Grey
5 cores	Black - Blue - Brown - Grey - Black
6 cores and more	White with black numbers

- with yellow/green (optional):

2 cores + earth (3G)	Yellow/green - Blue - Brown
3 cores + earth (3G)	Yellow/green - Black - Brown - Grey
4 cores + earth (3G)	Yellow/green - Black - Blue - Brown - Grey

BIOI 0.6/1 kV, BICI 0.6/1 kV Cu/MGT/XLPE/HF/CWB or SWB/HF

Armoured Fire Resistant Power and Control Cable

Max conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 1.5	1.6	0.7	0.9	0.2	0.8	8.7 ± 0.5	12.1	120
1 x 2.5	2.0	0.7	1.0	0.2	0.8	9.4 ± 0.5	7.41	150
1 x 4	2.5	0.7	1.0	0.2	0.8	9.9 ± 0.5	4.61	180
1 x 6	3.1	0.7	1.0	0.2	0.8	10.1 ± 0.8	3.08	220
1 x 10	4.0	0.7	1.0	0.2	0.8	10.4 ± 0.8	1.83	260
1 x 16	5.0	0.7	1.1	0.2	0.9	11.8 ± 0.8	1.15	340
1 x 25	6.3	0.9	1.1	0.3	0.9	14 ± 0.8	0.727	470
1 x 35	7.5	0.9	1.2	0.3	0.9	15.4 ± 0.8	0.542	570
1 x 50	8.7	1.0	1.2	0.3	1.0	17 ± 0.8	0.387	740
1 x 70	10.5	1.1	1.3	0.3	1.0	19.2 ± 0.8	0.268	990
1 x 95	12.4	1.1	1.4	0.3	1.1	21.5 ± 1	0.193	1290
1 x 120	14.0	1.2	1.5	0.3	1.1	23.5 ± 1	0.153	1585
1 x 150	16.0	1.4	1.6	0.3	1.2	26.2 ± 1	0.124	1910
1 x 185	17.8	1.6	1.7	0.3	1.3	28.9 ± 1	0.099	2360
1 x 240	20.3	1.7	1.8	0.3	1.3	32 ± 1	0.075	3000
1 x 300	22.9	1.8	1.9	0.4	1.4	35.2 ± 1.2	0.060	3740
2 x 1.5	1.6	0.7	1.1	0.2	0.9	11.8 ± 0.8	12.1	230
2 x 2.5	2.0	0.7	1.1	0.2	0.9	12.6 ± 0.8	7.41	270
2 x 4	2.5	0.7	1.1	0.3	0.9	14.1 ± 0.8	4.61	330
2 x 6	3.1	0.7	1.2	0.3	0.9	15.5 ± 0.8	3.08	390
2 x 10	4.0	0.7	1.3	0.3	1.0	17.7 ± 0.8	1.83	535
2 x 16	5.0	0.7	1.3	0.3	1.0	19.7 ± 0.8	1.15	710
2 x 25	6.3	0.9	1.5	0.3	1.1	23.7 ± 1	1.83	1020
2 x 35	7.5	0.9	1.6	0.3	1.2	26.5 ± 1	1.15	1250
3 x 1.5	1.6	0.7	1.1	0.2	0.9	12.4 ± 0.8	12.1	260
3 G 1.5	1.6	0.7	1.1	0.2	0.9	12.4 ± 0.8	12.1	260
3 x 2.5	2.0	0.7	1.1	0.3	0.9	13.8 ± 0.8	7.41	300
3 G 2.5	2.0	0.7	1.1	0.3	0.9	13.8 ± 0.8	7.41	300
3 x 4	2.5	0.7	1.2	0.3	0.9	15 ± 0.8	4.61	385
3 x 6	3.1	0.7	1.2	0.3	1.0	16.5 ± 0.8	3.08	480
3 x 10	4.0	0.7	1.3	0.3	1.0	18.7 ± 0.8	1.83	660
3 x 16	5.0	0.7	1.4	0.3	1.1	21.2 ± 1	1.15	900
3 x 25	6.3	0.9	1.5	0.3	1.2	25.3 ± 1	0.727	1320
3 x 35	7.5	0.9	1.6	0.3	1.2	28.1 ± 1	0.542	1690
3 x 50	8.7	1.0	1.8	0.3	1.3	32.4 ± 1	0.387	2160
3 x 70	10.5	1.1	2.0	0.4	1.5	37.8 ± 1.2	0.268	3050
3 x 95	12.4	1.1	2.1	0.4	1.6	42.4 ± 1.2	0.193	4010

BIOI 0.6/1 kV, BICI 0.6/1 kV Cu/MGT/XLPE/HF/CWB or SWB/HF

Armoured Fire Resistant Power and Control Cable

Max conductor temperature: 90°C

Range and dimensions

Number of cores x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering thickness	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
4 x 1.5	1.6	0.7	1.1	0.3	0.9	13.8 ± 0.8	12.1	300
4 G 1.5	1.6	0.7	1.1	0.3	0.9	13.8 ± 0.8	12.1	300
4 x 2.5	2.0	0.7	1.2	0.3	0.9	14.9 ± 0.8	7.41	375
4 G 2.5	2.0	0.7	1.2	0.3	0.9	14.9 ± 0.8	7.41	375
4 x 4	2.5	0.7	1.2	0.3	1.0	16.4 ± 0.8	4.61	470
4 x 6	3.1	0.7	1.3	0.3	1.0	18 ± 0.8	3.08	580
4 x 10	4.0	0.7	1.4	0.3	1.1	20.6 ± 1	1.83	830
4 x 16	5.0	0.7	1.5	0.3	1.1	23.2 ± 1	1.15	1110
4 x 25	6.3	0.9	1.6	0.3	1.2	27.7 ± 1	0.727	1650
4 x 35	7.5	0.9	1.8	0.3	1.3	31.5 ± 1	0.524	2145
4 x 50	8.7	1.0	1.9	0.4	1.4	36.1 ± 1.2	0.387	2860
4 x 70	10.5	1.1	2.1	0.4	1.6	41.7 ± 1.2	0.268	3910
5 x 1.5	1.6	0.7	1.2	0.3	0.9	14.9 ± 0.8	12.1	360
6 x 1.5	1.6	0.7	1.2	0.3	1.0	16.2 ± 0.8	12.1	400
7 x 1.5	1.6	0.7	1.2	0.3	1.0	16.2 ± 0.8	12.1	430
8 x 1.5	1.6	0.7	1.3	0.3	1.0	17.9 ± 0.8	12.1	490
10 x 1.5	1.6	0.7	1.3	0.3	1.0	19.8 ± 0.8	12.1	590
12 x 1.5	1.6	0.7	1.4	0.3	1.1	20.7 ± 1	12.1	680
16 x 1.5	1.6	0.7	1.5	0.3	1.1	22.6 ± 1	12.1	820
19 x 1.5	1.6	0.7	1.5	0.3	1.2	23.8 ± 1	12.1	930
27 x 1.5	1.6	0.7	1.7	0.3	1.3	25.4 ± 1	12.1	1250
37 x 1.5	1.6	0.7	1.8	0.3	1.4	33.1 ± 1	12.1	1630
5 x 2.5	2.0	0.7	1.2	0.3	1.0	16.8 ± 0.8	7.41	440
6 x 2.5	2.0	0.7	1.2	0.3	1.0	17.5 ± 0.8	7.41	490
7 x 2.5	2.0	0.7	1.3	0.3	1.0	18.2 ± 0.8	7.41	540
8 x 2.5	2.0	0.7	1.3	0.3	1.1	18.9 ± 0.8	7.41	590
10 x 2.5	2.0	0.7	1.4	0.3	1.1	21.9 ± 1	7.41	640
12 x 2.5	2.0	0.7	1.5	0.3	1.1	23.4 ± 1	7.41	850
16 x 2.5	2.0	0.7	1.6	0.3	1.2	26.0 ± 1	7.41	1070
19 x 2.5	2.0	0.7	1.6	0.3	1.2	27.5 ± 1	7.41	1200
24 x 2.5	2.0	0.7	1.8	0.3	1.3	31.7 ± 1	7.41	1540
27 x 2.5	2.0	0.7	1.8	0.3	1.3	32.3 ± 1	7.41	1660
37 x 2.5	2.0	0.7	1.9	0.4	1.4	36.6 ± 1.2	7.41	2220


We create the links

Group 3
Instrumentation Cable

TFOI 250V
Armoured Instrumentation Cable

Cu/XLPE/BED/CWB/HF
Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications.

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Laying up	Laying up of pairs/triples/quads
Bedding	Flame retardant halogen free polyolefin compound, extruded or lapped
Armour	Plain or tinned copper wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

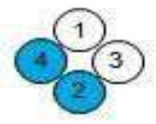
Unit	0.75 mm^2
Capacitance, nom. 800Hz nF/km	24.5
Loop Inductance, nom. mH/km	0.7
Insulation resistance at 20°C MOhm.km	≥3670

Pair identification:

- The pairs have the following number identification:

Pair no. 1	core no. 1 & 2
Pair no. 2	core no. 3 & 4
Pair no. 3	core no. 5 & 6
Pair no. 4	etc

- Triple cable is identified with no. 1, 2 and 3.
- Quad cable has the following identification.



Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	4.7	0.2	1.0	7.8 ± 0.5	24.5	85
2 x 2 x 0.75	1.1	0.5	7.8	0.2	1.2	11.3 ± 0.8	24.8	155
3 x 2 x 0.75	1.1	0.5	8.4	0.2	1.2	11.9 ± 0.8	24.8	180
4 x 2 x 0.75	1.1	0.5	9.1	0.2	1.2	12.6 ± 0.8	24.8	200
7 x 2 x 0.75	1.1	0.5	11.3	0.3	1.3	15.3 ± 0.8	24.8	320
8 x 2 x 0.75	1.1	0.5	12.2	0.3	1.3	16.2 ± 0.8	24.8	350
10 x 2 x 0.75	1.1	0.5	13.9	0.3	1.4	18.1 ± 0.8	24.8	420
12 x 2 x 0.75	1.1	0.5	14.6	0.3	1.4	18.8 ± 0.8	24.8	470
14 x 2 x 0.75	1.1	0.5	15.3	0.3	1.5	19.7 ± 0.8	24.8	530
16 x 2 x 0.75	1.1	0.5	16.6	0.3	1.5	21.0 ± 1	24.8	595
19 x 2 x 0.75	1.1	0.5	17.5	0.3	1.6	22.1 ± 1	24.8	670
24 x 2 x 0.75	1.1	0.5	20.1	0.3	1.7	24.9 ± 1	24.8	820
30 x 2 x 0.75	1.1	0.5	22.7	0.3	1.8	27.7 ± 1	24.8	990
32 x 2 x 0.75	1.1	0.5	23.2	0.3	1.8	28.2 ± 1	24.8	1040
37 x 2 x 0.75	1.1	0.5	24.5	0.3	1.8	29.5 ± 1	24.8	1160
1 x 2 x 1	1.3	0.5	5.1	0.2	1.0	8.2 ± 0.5	18.1	90
2 x 2 x 1	1.3	0.5	8.5	0.2	1.2	12.0 ± 0.8	18.3	170
3 x 2 x 1	1.3	0.5	9.2	0.2	1.2	12.7 ± 0.8	18.3	210
4 x 2 x 1	1.3	0.5	9.9	0.2	1.2	13.4 ± 0.8	18.3	240
7 x 2 x 1	1.3	0.5	12.3	0.3	1.3	16.3 ± 0.8	18.3	370
8 x 2 x 1	1.3	0.5	13.3	0.3	1.4	17.5 ± 0.8	18.3	420
10 x 2 x 1	1.3	0.5	15.2	0.3	1.5	19.6 ± 0.8	18.3	510
12 x 2 x 1	1.3	0.5	15.9	0.3	1.5	20.3 ± 1	18.3	570
14 x 2 x 1	1.3	0.5	16.6	0.3	1.5	21.0 ± 1	18.3	630
16 x 2 x 1	1.3	0.5	18.1	0.3	1.6	22.7 ± 1	18.3	710
19 x 2 x 1	1.3	0.5	19.0	0.3	1.6	23.6 ± 1	18.3	800
24 x 2 x 1	1.3	0.5	21.9	0.3	1.7	26.7 ± 1	18.3	990
30 x 2 x 1	1.3	0.5	24.8	0.3	1.8	29.8 ± 1	18.3	1200
32 x 2 x 1	1.3	0.5	25.3	0.3	1.9	30.5 ± 1	18.3	1280
37 x 2 x 1	1.3	0.5	26.7	0.3	1.9	31.9 ± 1	18.3	1420
1 x 2 x 1.5	1.6	0.6	6.1	0.2	1.1	9.4 ± 0.5	12.1	120
2 x 2 x 1.5	1.6	0.6	10.2	0.3	1.3	14.2 ± 0.8	12.2	240
3 x 2 x 1.5	1.6	0.6	11.0	0.3	1.3	15.0 ± 0.8	12.2	290
4 x 2 x 1.5	1.6	0.6	11.9	0.3	1.3	15.9 ± 0.8	12.2	340
7 x 2 x 1.5	1.6	0.6	14.8	0.3	1.4	19.0 ± 0.8	12.2	500
8 x 2 x 1.5	1.6	0.6	16.0	0.3	1.5	20.4 ± 1	12.2	570
10 x 2 x 1.5	1.6	0.6	18.3	0.3	1.6	22.9 ± 1	12.2	680
12 x 2 x 1.5	1.6	0.6	19.2	0.3	1.6	23.8 ± 1	12.2	770
14 x 2 x 1.5	1.6	0.6	20.0	0.3	1.7	24.8 ± 1	12.2	870
16 x 2 x 1.5	1.6	0.6	21.8	0.3	1.7	26.6 ± 1	12.2	970

TFOI 250V

Armoured Instrumentation Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
19 x 2 x 1.5	1.6	0.6	22.9	0.3	1.8	27.9 ± 1	12.2	1110
24 x 2 x 1.5	1.6	0.6	26.4	0.3	1.9	31.6 ± 1	12.2	1360
30 x 2 x 1.5	1.6	0.6	29.9	0.3	2.0	35.3 ± 1.2	12.2	1670
32 x 2 x 1.5	1.6	0.6	30.5	0.4	2.1	36.6 ± 1.2	12.2	1860
37 x 2 x 1.5	1.6	0.6	32.2	0.4	2.2	38.5 ± 1.2	12.2	2090
1 x 3 x 0.75	1.1	0.5	5.0	0.2	1.0	8.1 ± 0.5	24.5	95
2 x 3 x 0.75	1.1	0.5	8.6	0.2	1.2	12.1 ± 0.8	24.8	180
3 x 3 x 0.75	1.1	0.5	9.2	0.2	1.2	12.7 ± 0.8	24.8	220
4 x 3 x 0.75	1.1	0.5	10.3	0.3	1.3	14.3 ± 0.8	24.8	290
7 x 3 x 0.75	1.1	0.5	13.4	0.3	1.4	17.6 ± 0.8	24.8	430
8 x 3 x 0.75	1.1	0.5	14.5	0.3	1.4	18.7 ± 0.8	24.8	480
10 x 3 x 0.75	1.1	0.5	16.7	0.3	1.5	21.1 ± 1	24.8	580
12 x 3 x 0.75	1.1	0.5	17.7	0.3	1.6	22.3 ± 1	24.8	660
14 x 3 x 0.75	1.1	0.5	18.6	0.3	1.6	23.2 ± 1	24.8	730
16 x 3 x 0.75	1.1	0.5	19.9	0.3	1.6	24.5 ± 1	24.8	810
19 x 3 x 0.75	1.1	0.5	21.7	0.3	1.7	26.5 ± 1	24.8	950
24 x 3 x 0.75	1.1	0.5	24.3	0.3	1.8	29.3 ± 1	24.8	1150
30 x 3 x 0.75	1.1	0.5	27.1	0.3	1.9	32.3 ± 1	24.8	1390
32 x 3 x 0.75	1.1	0.5	28.2	0.3	2.0	33.6 ± 1	24.8	1490
37 x 3 x 0.75	1.1	0.5	29.7	0.3	2.0	35.1 ± 1.2	24.8	1660
1 x 3 x 1	1.3	0.5	5.5	0.2	1.1	8.8 ± 0.5	18.1	110
2 x 3 x 1	1.3	0.5	9.5	0.2	1.2	13.0 ± 0.8	18.3	210
3 x 3 x 1	1.3	0.5	10.2	0.3	1.3	14.2 ± 0.8	18.3	280
4 x 3 x 1	1.3	0.5	11.4	0.3	1.3	15.4 ± 0.8	18.3	340
7 x 3 x 1	1.3	0.5	14.8	0.3	1.4	19.0 ± 0.8	18.3	520
8 x 3 x 1	1.3	0.5	16.0	0.3	1.5	20.4 ± 1	18.3	590
10 x 3 x 1	1.3	0.5	18.4	0.3	1.6	23.0 ± 1	18.3	700
12 x 3 x 1	1.3	0.5	19.6	0.3	1.6	24.2 ± 1	18.3	800
14 x 3 x 1	1.3	0.5	20.6	0.3	1.7	25.4 ± 1	18.3	900
16 x 3 x 1	1.3	0.5	22.0	0.3	1.7	26.8 ± 1	18.3	1000
19 x 3 x 1	1.3	0.5	24.0	0.3	1.8	29.0 ± 1	18.3	1160
24 x 3 x 1	1.3	0.5	26.8	0.3	1.9	32.0 ± 1	18.3	1420
30 x 3 x 1	1.3	0.5	30.0	0.4	2.1	36.1 ± 1.2	18.3	1830
32 x 3 x 1	1.3	0.5	31.2	0.4	2.1	37.3 ± 1.2	18.3	1940
37 x 3 x 1	1.3	0.5	32.9	0.4	2.2	39.2 ± 1.2	18.3	2180

TFOI 250V
Armoured Instrumentation Cable

Cu/XLPE/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 1.5	1.6	0.6	6.5	0.2	1.1	9.8 ± 0.5	12.1	140
2 x 3 x 1.5	1.6	0.6	11.2	0.3	1.3	15.2 ± 0.8	12.2	300
3 x 3 x 1.5	1.6	0.6	12.1	0.3	1.3	16.1 ± 0.8	12.2	370
4 x 3 x 1.5	1.6	0.6	13.5	0.3	1.4	17.7 ± 0.8	12.2	450
7 x 3 x 1.5	1.6	0.6	17.6	0.3	1.6	22.2 ± 1	12.2	710
8 x 3 x 1.5	1.6	0.6	19.0	0.3	1.6	23.6 ± 1	12.2	790
10 x 3 x 1.5	1.6	0.6	21.9	0.3	1.7	26.7 ± 1	12.2	950
12 x 3 x 1.5	1.6	0.6	23.3	0.3	1.8	28.3 ± 1	12.2	1100
14 x 3 x 1.5	1.6	0.6	24.5	0.3	1.8	29.5 ± 1	12.2	1220
16 x 3 x 1.5	1.6	0.6	26.2	0.3	1.9	31.4 ± 1	12.2	1370
19 x 3 x 1.5	1.6	0.6	28.5	0.3	2.0	33.9 ± 1	12.2	1610
24 x 3 x 1.5	1.6	0.6	31.9	0.4	2.1	37.5 ± 1.2	12.2	1970
30 x 3 x 1.5	1.6	0.6	35.7	0.4	2.3	42.2 ± 1.2	12.2	2530
32 x 3 x 1.5	1.6	0.6	37.1	0.4	2.4	43.8 ± 1.2	12.2	2690
37 x 3 x 1.5	1.6	0.6	39.1	0.4	2.4	45.8 ± 1.2	12.2	3010

TFOI(c) 250V
Armoured Instrumentation Cable

Cu/XLPE/OSCR/BED/CWB/HF

Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Laying up	Laying up of pairs/triples/quads
Screen	Collective screen (Al/PET + tinned copper drain wire)
Bedding	Flame retardant halogen free polyolefin compound, extruded or lapped
Armour	Plain or tinned copper wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

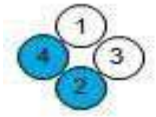
- Capacitance, nom. 800Hz
- Loop Inductance, nom.
- Insulation resistance at 20 °C

Unit	0.75 mm²
nF/km	24.5
mH/km	0.7
MOhm.km	≥3670

Pair identification:

- The pairs have the following number identification:
- Pair no. 1 core no. 1 & 2
- Pair no. 2 core no. 3 & 4
- Pair no. 3 core no. 5 & 6
- Pair no. 4 etc

- Triple cable is identified with no. 1, 2 and 3.



- Quad cable has the following identification

TFOI(c) 250V

Armoured Instrumentation Cable

Cu/XLPE/OSCR/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	4.7	0.2	1.0	7.9 ± 0.5	24.5	90
2 x 2 x 0.75	1.1	0.5	7.8	0.2	1.2	11.4 ± 0.8	24.8	160
3 x 2 x 0.75	1.1	0.5	8.4	0.2	1.2	12.0 ± 0.8	24.8	185
4 x 2 x 0.75	1.1	0.5	9.1	0.2	1.2	12.7 ± 0.8	24.8	205
7 x 2 x 0.75	1.1	0.5	11.3	0.3	1.3	15.4 ± 0.8	24.8	325
8 x 2 x 0.75	1.1	0.5	12.2	0.3	1.3	16.3 ± 0.8	24.8	355
10 x 2 x 0.75	1.1	0.5	13.9	0.3	1.4	18.2 ± 0.8	24.8	425
12 x 2 x 0.75	1.1	0.5	14.6	0.3	1.4	18.9 ± 0.8	24.8	475
14 x 2 x 0.75	1.1	0.5	15.3	0.3	1.5	19.8 ± 0.8	24.8	535
16 x 2 x 0.75	1.1	0.5	16.6	0.3	1.5	21.1 ± 1	24.8	600
19 x 2 x 0.75	1.1	0.5	17.5	0.3	1.6	22.2 ± 1	24.8	680
24 x 2 x 0.75	1.1	0.5	20.1	0.3	1.7	25.0 ± 1	24.8	830
30 x 2 x 0.75	1.1	0.5	22.7	0.3	1.8	27.8 ± 1	24.8	1000
32 x 2 x 0.75	1.1	0.5	23.2	0.3	1.8	28.3 ± 1	24.8	1050
37 x 2 x 0.75	1.1	0.5	24.5	0.3	1.8	29.6 ± 1	24.8	1170
1 x 2 x 1	1.3	0.5	5.1	0.2	1.0	8.3 ± 0.5	18.1	95
2 x 2 x 1	1.3	0.5	8.5	0.2	1.2	12.1 ± 0.8	18.3	175
3 x 2 x 1	1.3	0.5	9.2	0.2	1.2	12.8 ± 0.8	18.3	215
4 x 2 x 1	1.3	0.5	9.9	0.2	1.2	13.5 ± 0.8	18.3	245
7 x 2 x 1	1.3	0.5	12.3	0.3	1.3	16.4 ± 0.8	18.3	375
8 x 2 x 1	1.3	0.5	13.3	0.3	1.4	17.6 ± 0.8	18.3	425
10 x 2 x 1	1.3	0.5	15.2	0.3	1.5	19.7 ± 0.8	18.3	515
12 x 2 x 1	1.3	0.5	15.9	0.3	1.5	20.4 ± 1	18.3	575
14 x 2 x 1	1.3	0.5	16.6	0.3	1.5	21.1 ± 1	18.3	635
16 x 2 x 1	1.3	0.5	18.1	0.3	1.6	22.8 ± 1	18.3	715
19 x 2 x 1	1.3	0.5	19.0	0.3	1.6	23.7 ± 1	18.3	810
24 x 2 x 1	1.3	0.5	21.9	0.3	1.7	26.8 ± 1	18.3	1000
30 x 2 x 1	1.3	0.5	24.8	0.3	1.8	29.9 ± 1	18.3	1210
32 x 2 x 1	1.3	0.5	25.3	0.3	1.9	30.6 ± 1	18.3	1290
37 x 2 x 1	1.3	0.5	26.7	0.3	1.9	32.0 ± 1	18.3	1430
1 x 2 x 1.5	1.6	0.6	6.1	0.2	1.1	9.5 ± 0.5	12.1	125
2 x 2 x 1.5	1.6	0.6	10.2	0.3	1.3	14.3 ± 0.8	12.2	245
3 x 2 x 1.5	1.6	0.6	11.0	0.3	1.3	15.1 ± 0.8	12.2	295
4 x 2 x 1.5	1.6	0.6	11.9	0.3	1.3	16.0 ± 0.8	12.2	345
7 x 2 x 1.5	1.6	0.6	14.8	0.3	1.4	19.1 ± 0.8	12.2	505
8 x 2 x 1.5	1.6	0.6	16.0	0.3	1.5	20.5 ± 1	12.2	575
10 x 2 x 1.5	1.6	0.6	18.3	0.3	1.6	23.0 ± 1	12.2	685
12 x 2 x 1.5	1.6	0.6	19.2	0.3	1.6	23.9 ± 1	12.2	775
14 x 2 x 1.5	1.6	0.6	20.0	0.3	1.7	24.9 ± 1	12.2	875
16 x 2 x 1.5	1.6	0.6	21.8	0.3	1.7	26.7 ± 1	12.2	975

TFOI(c) 250V
Armoured Instrumentation Cable

Cu/XLPE/OSCR/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
19 x 2 x 1.5	1.6	0.6	22.9	0.3	1.8	28.0 ± 1	12.2	1120
24 x 2 x 1.5	1.6	0.6	26.4	0.3	1.9	31.7 ± 1	12.2	1370
30 x 2 x 1.5	1.6	0.6	29.9	0.3	2.0	35.4 ± 1.2	12.2	1680
32 x 2 x 1.5	1.6	0.6	30.5	0.4	2.1	36.7 ± 1.2	12.2	1870
37 x 2 x 1.5	1.6	0.6	32.2	0.4	2.2	38.6 ± 1.2	12.2	2100
1 x 3 x 0.75	1.1	0.5	5.0	0.2	1.0	8.2 ± 0.5	24.5	100
2 x 3 x 0.75	1.1	0.5	8.6	0.2	1.2	12.2 ± 0.8	24.8	185
3 x 3 x 0.75	1.1	0.5	9.2	0.2	1.2	12.8 ± 0.8	24.8	225
4 x 3 x 0.75	1.1	0.5	10.3	0.3	1.3	14.4 ± 0.8	24.8	295
7 x 3 x 0.75	1.1	0.5	13.4	0.3	1.4	17.7 ± 0.8	24.8	435
8 x 3 x 0.75	1.1	0.5	14.5	0.3	1.4	18.8 ± 0.8	24.8	485
10 x 3 x 0.75	1.1	0.5	16.7	0.3	1.5	21.2 ± 1	24.8	585
12 x 3 x 0.75	1.1	0.5	17.7	0.3	1.6	22.4 ± 1	24.8	665
14 x 3 x 0.75	1.1	0.5	18.6	0.3	1.6	23.3 ± 1	24.8	735
16 x 3 x 0.75	1.1	0.5	19.9	0.3	1.6	24.6 ± 1	24.8	815
19 x 3 x 0.75	1.1	0.5	21.7	0.3	1.7	26.6 ± 1	24.8	960
24 x 3 x 0.75	1.1	0.5	24.3	0.3	1.8	29.4 ± 1	24.8	1160
30 x 3 x 0.75	1.1	0.5	27.1	0.3	1.9	32.4 ± 1	24.8	1400
32 x 3 x 0.75	1.1	0.5	28.2	0.3	2.0	33.7 ± 1	24.8	1500
37 x 3 x 0.75	1.1	0.5	29.7	0.3	2.0	35.2 ± 1.2	24.8	1670
1 x 3 x 1	1.3	0.5	5.5	0.2	1.1	8.9 ± 0.5	18.1	115
2 x 3 x 1	1.3	0.5	9.5	0.2	1.2	13.1 ± 0.8	18.3	215
3 x 3 x 1	1.3	0.5	10.2	0.3	1.3	14.3 ± 0.8	18.3	285
4 x 3 x 1	1.3	0.5	11.4	0.3	1.3	15.5 ± 0.8	18.3	345
7 x 3 x 1	1.3	0.5	14.8	0.3	1.4	19.1 ± 0.8	18.3	525
8 x 3 x 1	1.3	0.5	16.0	0.3	1.5	20.5 ± 1	18.3	595
10 x 3 x 1	1.3	0.5	18.4	0.3	1.6	23.1 ± 1	18.3	705
12 x 3 x 1	1.3	0.5	19.6	0.3	1.6	24.3 ± 1	18.3	805
14 x 3 x 1	1.3	0.5	20.6	0.3	1.7	25.5 ± 1	18.3	905
16 x 3 x 1	1.3	0.5	22.0	0.3	1.7	26.9 ± 1	18.3	1005
19 x 3 x 1	1.3	0.5	24.0	0.3	1.8	29.1 ± 1	18.3	1170
24 x 3 x 1	1.3	0.5	26.8	0.3	1.9	32.1 ± 1	18.3	1430
30 x 3 x 1	1.3	0.5	30.0	0.4	2.1	36.2 ± 1.2	18.3	1840
32 x 3 x 1	1.3	0.5	31.2	0.4	2.1	37.4 ± 1.2	18.3	1950
37 x 3 x 1	1.3	0.5	32.9	0.4	2.2	39.3 ± 1.2	18.3	2190

TFOI(c) 250V

Armoured Instrumentation Cable

Cu/XLPE/OSCR/BED/CWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 1.5	1.6	0.6	6.5	0.2	1.1	9.9 ± 0.5	12.1	145
2 x 3 x 1.5	1.6	0.6	11.2	0.3	1.3	15.3 ± 0.8	12.2	305
3 x 3 x 1.5	1.6	0.6	12.1	0.3	1.3	16.2 ± 0.8	12.2	375
4 x 3 x 1.5	1.6	0.6	13.5	0.3	1.4	17.8 ± 0.8	12.2	455
7 x 3 x 1.5	1.6	0.6	17.6	0.3	1.6	22.3 ± 1	12.2	715
8 x 3 x 1.5	1.6	0.6	19.0	0.3	1.6	23.7 ± 1	12.2	795
10 x 3 x 1.5	1.6	0.6	21.9	0.3	1.7	26.8 ± 1	12.2	955
12 x 3 x 1.5	1.6	0.6	23.3	0.3	1.8	28.4 ± 1	12.2	1105
14 x 3 x 1.5	1.6	0.6	24.5	0.3	1.8	29.6 ± 1	12.2	1225
16 x 3 x 1.5	1.6	0.6	26.2	0.3	1.9	31.5 ± 1	12.2	1375
19 x 3 x 1.5	1.6	0.6	28.5	0.3	2.0	34.0 ± 1	12.2	1620
24 x 3 x 1.5	1.6	0.6	31.9	0.4	2.1	37.6 ± 1.2	12.2	1980
30 x 3 x 1.5	1.6	0.6	35.7	0.4	2.3	42.3 ± 1.2	12.2	2540
32 x 3 x 1.5	1.6	0.6	37.1	0.4	2.4	43.9 ± 1.2	12.2	2700
37 x 3 x 1.5	1.6	0.6	39.1	0.4	2.4	45.9 ± 1.2	12.2	3020

TFOI(i & c) 250V
Armoured Instrumentation Cable

Cu/XLPE/ISCR/OSCR/BED/CWB/HF

Rated voltage: 150/250V Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Screen	Individual screen (Al/PET + tinned copper drain wire)
Laying up	Laying up of pairs/triples/quads
Screen	Collective screen (Al/PET + tinned copper drain wire)
Bedding	Flame retardant halogen free polyolefin compound, extruded or lapped
Armour	Plain or tinned copper wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

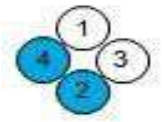
	Unit	0.75 mm²
Capacitance, nom. 800Hz	nF/km	24.5
Loop Inductance, nom.	mH/km	0.7
Insulation resistance at 20 °C	MOhm.km	≥3670

Pair identification:

- The pairs have the following number identification:

Pair no. 1	core no. 1 & 2
Pair no. 2	core no. 3 & 4
Pair no. 3	core no. 5 & 6
Pair no. 4	etc

- Triple cable is identified with no. 1, 2 and 3.



- Quad cable has the following identification

TFOI(i & c) 250V
Armoured Instrumentation Cable

Cu/XLPE/ISCR/OSCR/BED/CWB/HF

Rated voltage: 150/250V Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm ^{2}	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	4.8	0.2	1.0	7.9 ± 0.5	24.5	80
2 x 2 x 0.75	1.1	0.5	8.5	0.2	1.2	12.0 ± 0.8	24.8	170
3 x 2 x 0.75	1.1	0.5	9.1	0.2	1.2	12.6 ± 0.8	24.8	210
4 x 2 x 0.75	1.1	0.5	10.2	0.3	1.3	14.2 ± 0.8	24.8	270
7 x 2 x 0.75	1.1	0.5	12.1	0.3	1.3	16.1 ± 0.8	24.8	380
8 x 2 x 0.75	1.1	0.5	13.5	0.3	1.4	17.7 ± 0.8	24.8	440
10 x 2 x 0.75	1.1	0.5	15.6	0.3	1.5	20.0 ± 1	24.8	530
12 x 2 x 0.75	1.1	0.5	16.3	0.3	1.5	20.7 ± 1	24.8	590
14 x 2 x 0.75	1.1	0.5	17.2	0.3	1.5	21.6 ± 1	24.8	660
16 x 2 x 0.75	1.1	0.5	18.6	0.3	1.6	23.2 ± 1	24.8	750
19 x 2 x 0.75	1.1	0.5	19.1	0.3	1.6	23.7 ± 1	24.8	830
24 x 2 x 0.75	1.1	0.5	22.6	0.3	1.8	27.6 ± 1	24.8	1050
30 x 2 x 0.75	1.1	0.5	24.3	0.3	1.8	29.3 ± 1	24.8	1240
32 x 2 x 0.75	1.1	0.5	24.7	0.3	1.8	29.7 ± 1	24.8	1300
37 x 2 x 0.75	1.1	0.5	26.2	0.3	1.9	31.4 ± 1	24.8	1470
1 x 2 x 1	1.3	0.5	5.2	0.2	1.0	8.3 ± 0.5	18.1	90
2 x 2 x 1	1.3	0.5	9.2	0.2	1.2	12.7 ± 0.8	18.3	200
3 x 2 x 1	1.3	0.5	9.9	0.2	1.2	13.4 ± 0.8	18.3	240
4 x 2 x 1	1.3	0.5	11.0	0.3	1.3	15.0 ± 0.8	18.3	320
7 x 2 x 1	1.3	0.5	13.1	0.3	1.4	17.3 ± 0.8	18.3	460
8 x 2 x 1	1.3	0.5	14.6	0.3	1.4	18.8 ± 0.8	18.3	520
10 x 2 x 1	1.3	0.5	16.9	0.3	1.5	21.3 ± 1	18.3	630
12 x 2 x 1	1.3	0.5	17.6	0.3	1.6	22.2 ± 1	18.3	710
14 x 2 x 1	1.3	0.5	18.7	0.3	1.6	23.3 ± 1	18.3	800
16 x 2 x 1	1.3	0.5	20.2	0.3	1.7	25.0 ± 1	18.3	910
19 x 2 x 1	1.3	0.5	20.7	0.3	1.7	25.5 ± 1	18.3	1010
24 x 2 x 1	1.3	0.5	24.5	0.3	1.8	29.5 ± 1	18.3	1270
30 x 2 x 1	1.3	0.5	26.3	0.3	1.9	31.5 ± 1	18.3	1520
32 x 2 x 1	1.3	0.5	26.8	0.3	1.9	32.0 ± 1	18.3	1580
37 x 2 x 1	1.3	0.5	28.4	0.3	2.0	33.8 ± 1	18.3	1800
1 x 2 x 1.5	1.6	0.6	6.2	0.2	1.1	9.5 ± 0.5	12.1	120
2 x 2 x 1.5	1.6	0.6	11.0	0.3	1.3	15.0 ± 0.8	12.2	280
3 x 2 x 1.5	1.6	0.6	11.8	0.3	1.3	15.8 ± 0.8	12.2	330
4 x 2 x 1.5	1.6	0.6	13.1	0.3	1.4	17.3 ± 0.8	12.2	410
7 x 2 x 1.5	1.6	0.6	15.6	0.3	1.5	20.0 ± 1	12.2	600
8 x 2 x 1.5	1.6	0.6	17.4	0.3	1.5	21.8 ± 1	12.2	680
10 x 2 x 1.5	1.6	0.6	20.1	0.3	1.7	24.9 ± 1	12.2	830
12 x 2 x 1.5	1.6	0.6	21.0	0.3	1.7	25.8 ± 1	12.2	930
14 x 2 x 1.5	1.6	0.6	22.3	0.3	1.7	27.1 ± 1	12.2	1050
16 x 2 x 1.5	1.6	0.6	24.1	0.3	1.8	29.1 ± 1	12.2	1180

TFOI(i & c) 250V
Armoured Instrumentation Cable

Cu/XLPE/ISCR/OSCR/BED/CWB/HF

Rated voltage: 150/250V Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
19 x 2 x 1.5	1.6	0.6	24.7	0.3	1.8	29.7 ± 1	12.2	1320
24 x 2 x 1.5	1.6	0.6	29.3	0.3	2.0	34.7 ± 1	12.2	1675
30 x 2 x 1.5	1.6	0.6	31.4	0.4	2.1	37.5 ± 1.2	12.2	2105
32 x 2 x 1.5	1.6	0.6	32.0	0.4	2.2	38.3 ± 1.2	12.2	2225
37 x 2 x 1.5	1.6	0.6	33.9	0.4	2.2	40.2 ± 1.2	12.2	2500
1 x 3 x 0.75	1.1	0.5	5.1	0.2	1.0	8.2 ± 0.5	24.5	100
2 x 3 x 0.75	1.1	0.5	9.1	0.2	1.2	12.6 ± 0.8	24.8	200
3 x 3 x 0.75	1.1	0.5	9.8	0.2	1.2	13.3 ± 0.8	24.8	250
4 x 3 x 0.75	1.1	0.5	11.0	0.3	1.3	15.0 ± 0.8	24.8	330
7 x 3 x 0.75	1.1	0.5	14.2	0.3	1.4	18.4 ± 0.8	24.8	500
8 x 3 x 0.75	1.1	0.5	15.4	0.3	1.5	19.8 ± 0.8	24.8	570
10 x 3 x 0.75	1.1	0.5	17.7	0.3	1.6	22.3 ± 1	24.8	680
12 x 3 x 0.75	1.1	0.5	18.9	0.3	1.6	23.5 ± 1	24.8	770
14 x 3 x 0.75	1.1	0.5	19.8	0.3	1.6	24.4 ± 1	24.8	860
16 x 3 x 0.75	1.1	0.5	21.2	0.3	1.7	26.0 ± 1	24.8	970
19 x 3 x 0.75	1.1	0.5	23.1	0.3	1.8	28.1 ± 1	24.8	1110
24 x 3 x 0.75	1.1	0.5	25.8	0.3	1.9	31.0 ± 1	24.8	1360
30 x 3 x 0.75	1.1	0.5	28.8	0.3	2.0	34.2 ± 1	24.8	1650
32 x 3 x 0.75	1.1	0.5	30.0	0.4	2.1	36.1 ± 1.2	24.8	1870
37 x 3 x 0.75	1.1	0.5	31.6	0.4	2.1	37.7 ± 1.2	24.8	2085
1 x 3 x 1	1.3	0.5	5.6	0.2	1.1	8.9 ± 0.5	18.1	125
2 x 3 x 1	1.3	0.5	10.0	0.3	1.3	14.0 ± 0.8	18.3	260
3 x 3 x 1	1.3	0.5	10.8	0.3	1.3	14.8 ± 0.8	18.3	320
4 x 3 x 1	1.3	0.5	12.0	0.3	1.3	16.0 ± 0.8	18.3	390
7 x 3 x 1	1.3	0.5	15.6	0.3	1.5	20.0 ± 1	18.3	610
8 x 3 x 1	1.3	0.5	16.9	0.3	1.5	21.3 ± 1	18.3	680
10 x 3 x 1	1.3	0.5	19.4	0.3	1.6	24.0 ± 1	18.3	810
12 x 3 x 1	1.3	0.5	20.7	0.3	1.7	25.5 ± 1	18.3	940
14 x 3 x 1	1.3	0.5	21.7	0.3	1.7	26.5 ± 1	18.3	1050
16 x 3 x 1	1.3	0.5	23.3	0.3	1.8	28.3 ± 1	18.3	1180
19 x 3 x 1	1.3	0.5	25.3	0.3	1.9	30.5 ± 1	18.3	1370
24 x 3 x 1	1.3	0.5	28.4	0.3	2.0	33.8 ± 1	18.3	1690
30 x 3 x 1	1.3	0.5	31.7	0.4	2.1	37.8 ± 1.2	18.3	2150
32 x 3 x 1	1.3	0.5	33.0	0.4	2.2	39.3 ± 1.2	18.3	2300
37 x 3 x 1	1.3	0.5	34.8	0.4	2.3	41.3 ± 1.2	18.3	2590

TFOI(i & c) 250V
Armoured Instrumentation Cable

Cu/XLPE/ISCR/OSCR/BED/CWB/HF

Rated voltage: 150/250V Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 1.5	1.6	0.6	6.6	0.2	1.1	9.9 ± 0.5	12.1	160
2 x 3 x 1.5	1.6	0.6	11.8	0.3	1.3	15.8 ± 0.8	12.2	330
3 x 3 x 1.5	1.6	0.6	12.7	0.3	1.4	16.9 ± 0.8	12.2	410
4 x 3 x 1.5	1.6	0.6	14.2	0.3	1.4	18.4 ± 0.8	12.2	500
7 x 3 x 1.5	1.6	0.6	18.4	0.3	1.6	23.0 ± 1	12.2	790
8 x 3 x 1.5	1.6	0.6	19.9	0.3	1.6	24.5 ± 1	12.2	890
10 x 3 x 1.5	1.6	0.6	22.9	0.3	1.8	27.9 ± 1	12.2	1080
12 x 3 x 1.5	1.6	0.6	24.4	0.3	1.8	29.4 ± 1	12.2	1230
14 x 3 x 1.5	1.6	0.6	25.6	0.3	1.9	20.8 ± 1	12.2	1390
16 x 3 x 1.5	1.6	0.6	27.4	0.3	1.9	32.6 ± 1	12.2	1570
19 x 3 x 1.5	1.6	0.6	29.9	0.3	2.0	35.3 ± 1.2	12.2	1830
24 x 3 x 1.5	1.6	0.6	33.5	0.4	2.2	39.8 ± 1.2	12.2	2360
30 x 3 x 1.5	1.6	0.6	37.4	0.4	2.4	44.1 ± 1.2	12.2	2880
32 x 3 x 1.5	1.6	0.6	38.9	0.4	2.4	45.6 ± 1.2	12.2	3060
37 x 3 x 1.5	1.6	0.6	41.0	0.4	2.5	47.9 ± 1.2	12.2	3450

TIOI 250V, TICI 250V
Armoured Instrumentation Cable

Cu/XLPE/HF/CWB/CWB or SWB/HF

Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications.

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Laying up	Laying up of pairs/triples/quads
Inner sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360
Armour	Plain/tinned copper wire braid or galvanised steel wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

- Capacitance, nom. 800Hz
- Loop Inductance, nom.
- Insulation resistance at 20 °C

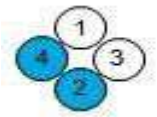
Unit	0.75 mm²
nF/km	24.5
mH/km	0.7
MOhm.km	≥3670

Pair identification:

- The pairs have the following number identification:

Pair no. 1	core no. 1 & 2
Pair no. 2	core no. 3 & 4
Pair no. 3	core no. 5 & 6
Pair no. 4	etc

- Triple cable is identified with no. 1, 2 and 3.
- Quad cable has the following identification



TIOI 250V, TICI 250V
Armoured Instrumentation Cable

Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	1.0	0.2	0.8	9.7 ± 0.5	24.5	130
2 x 2 x 0.75	1.1	0.5	1.1	0.3	0.9	13.4 ± 0.8	24.8	220
3 x 2 x 0.75	1.1	0.5	1.1	0.3	0.9	14.0 ± 0.8	24.8	250
4 x 2 x 0.75	1.1	0.5	1.2	0.3	0.9	15.0 ± 0.8	24.8	290
7 x 2 x 0.75	1.1	0.5	1.2	0.3	1.0	17.2 ± 0.8	24.8	390
8 x 2 x 0.75	1.1	0.5	1.3	0.3	1.0	18.3 ± 0.8	24.8	440
10 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	20.4 ± 1	24.8	530
12 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	21.1 ± 1	24.8	580
14 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	21.8 ± 1	24.8	630
16 x 2 x 0.75	1.1	0.5	1.5	0.3	1.1	23.3 ± 1	24.8	710
19 x 2 x 0.75	1.1	0.5	1.5	0.3	1.1	24.2 ± 1	24.8	790
24 x 2 x 0.75	1.1	0.5	1.6	0.3	1.2	27.2 ± 1	24.8	960
30 x 2 x 0.75	1.1	0.5	1.7	0.3	1.3	30.1 ± 1	24.8	1170
32 x 2 x 0.75	1.1	0.5	1.7	0.3	1.3	30.7 ± 1	24.8	1220
37 x 2 x 0.75	1.1	0.5	1.8	0.3	1.3	32.1 ± 1	24.8	1360
1 x 2 x 1	1.3	0.5	1.0	0.2	0.8	10.1 ± 0.8	18.1	150
2 x 2 x 1	1.3	0.5	1.1	0.3	0.9	14.2 ± 0.8	18.3	250
3 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.1 ± 0.8	18.3	290
4 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.8 ± 0.8	18.3	330
7 x 2 x 1	1.3	0.5	1.3	0.3	1.0	18.4 ± 0.8	18.3	460
8 x 2 x 1	1.3	0.5	1.3	0.3	1.0	19.4 ± 0.8	18.3	510
10 x 2 x 1	1.3	0.5	1.4	0.3	1.1	21.7 ± 1	18.3	610
12 x 2 x 1	1.3	0.5	1.4	0.3	1.1	22.4 ± 1	18.3	680
14 x 2 x 1	1.3	0.5	1.5	0.3	1.1	23.3 ± 1	18.3	750
16 x 2 x 1	1.3	0.5	1.5	0.3	1.2	25.0 ± 1	18.3	840
19 x 2 x 1	1.3	0.5	1.6	0.3	1.2	26.1 ± 1	18.3	950
24 x 2 x 1	1.3	0.5	1.7	0.3	1.3	29.4 ± 1	18.3	1170
30 x 2 x 1	1.3	0.5	1.8	0.3	1.3	32.5 ± 1	18.3	1410
32 x 2 x 1	1.3	0.5	1.8	0.3	1.4	33.2 ± 1	18.3	1480
37 x 2 x 1	1.3	0.5	1.9	0.4	1.4	35.2 ± 1.2	18.3	1730
1 x 2 x 1.5	1.6	0.6	1.0	0.2	0.8	11.1 ± 0.8	12.1	180
2 x 2 x 1.5	1.6	0.6	1.2	0.3	1.0	16.1 ± 0.8	12.2	310
3 x 2 x 1.5	1.6	0.6	1.2	0.3	1.0	16.9 ± 0.8	12.2	360
4 x 2 x 1.5	1.6	0.6	1.3	0.3	1.0	18.0 ± 0.8	12.2	430
7 x 2 x 1.5	1.6	0.6	1.4	0.3	1.1	21.3 ± 1	12.2	620
8 x 2 x 1.5	1.6	0.6	1.4	0.3	1.1	22.5 ± 1	12.2	680
10 x 2 x 1.5	1.6	0.6	1.5	0.3	1.2	25.2 ± 1	12.2	820
12 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	26.3 ± 1	12.2	920

TIOI 250V, TICI 250V
Armoured Instrumentation Cable

Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
14 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	27.1 ± 1	12.2	1010
16 x 2 x 1.5	1.6	0.6	1.7	0.3	1.3	29.3 ± 1	12.2	1150
19 x 2 x 1.5	1.6	0.6	1.7	0.3	1.3	30.4 ± 1	12.2	1290
24 x 2 x 1.5	1.6	0.6	1.9	0.4	1.4	34.9 ± 1	12.2	1680
30 x 2 x 1.5	1.6	0.6	2.0	0.4	1.5	38.8 ± 1.2	12.2	2030
32 x 2 x 1.5	1.6	0.6	2.0	0.4	1.5	39.4 ± 1.2	12.2	2120
37 x 2 x 1.5	1.6	0.6	2.1	0.4	1.6	41.5 ± 1.2	12.2	2390
1 x 3 x 0.75	1.1	0.5	1.0	0.2	0.8	10.0 ± 0.5	24.5	150
2 x 3 x 0.75	1.1	0.5	1.1	0.3	0.9	14.3 ± 0.8	24.8	260
3 x 3 x 0.75	1.1	0.5	1.2	0.3	0.9	15.1 ± 0.8	24.8	300
4 x 3 x 0.75	1.1	0.5	1.2	0.3	1.0	16.2 ± 0.8	24.8	360
7 x 3 x 0.75	1.1	0.5	1.3	0.3	1.0	19.5 ± 0.8	24.8	520
8 x 3 x 0.75	1.1	0.5	1.4	0.3	1.1	21.0 ± 1	24.8	590
10 x 3 x 0.75	1.1	0.5	1.5	0.3	1.1	23.4 ± 1	24.8	700
12 x 3 x 0.75	1.1	0.5	1.5	0.3	1.2	24.7 ± 1	24.8	790
14 x 3 x 0.75	1.1	0.5	1.5	0.3	1.2	25.5 ± 1	24.8	870
16 x 3 x 0.75	1.1	0.5	1.6	0.3	1.2	27.0 ± 1	24.8	970
19 x 3 x 0.75	1.1	0.5	1.7	0.3	1.3	29.2 ± 1	24.8	1130
24 x 3 x 0.75	1.1	0.5	1.8	0.3	1.3	32.0 ± 1	24.8	1350
30 x 3 x 0.75	1.1	0.5	1.9	0.4	1.4	35.6 ± 1.2	24.8	1710
32 x 3 x 0.75	1.1	0.5	1.9	0.4	1.4	36.7 ± 1.2	24.8	1800
37 x 3 x 0.75	1.1	0.5	2.0	0.4	1.5	38.6 ± 1.2	24.8	2020
1 x 3 x 1	1.3	0.5	1.0	0.2	0.8	10.5 ± 0.8	18.1	170
2 x 3 x 1	1.3	0.5	1.2	0.3	0.9	15.4 ± 0.8	18.3	300
3 x 3 x 1	1.3	0.5	1.2	0.3	1.0	16.2 ± 0.8	18.3	350
4 x 3 x 1	1.3	0.5	1.3	0.3	1.0	17.5 ± 0.8	18.3	420
7 x 3 x 1	1.3	0.5	1.4	0.3	1.1	21.3 ± 1	18.3	630
8 x 3 x 1	1.3	0.5	1.4	0.3	1.1	22.5 ± 1	18.3	690
10 x 3 x 1	1.3	0.5	1.5	0.3	1.2	25.3 ± 1	18.3	840
12 x 3 x 1	1.3	0.5	1.6	0.3	1.2	26.7 ± 1	18.3	950
14 x 3 x 1	1.3	0.5	1.6	0.3	1.2	27.7 ± 1	18.3	1050
19 x 3 x 1	1.3	0.5	1.8	0.3	1.3	31.7 ± 1	18.3	1360
24 x 3 x 1	1.3	0.5	1.9	0.4	1.4	35.3 ± 1.2	18.3	1730

TIOI 250V, TICI 250V

Armoured Instrumentation Cable

Cu/XLPE/HF/CWB or SWB/HF

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
30 x 3 x 1	1.3	0.5	2.0	0.4	1.5	38.9 ± 1.2	18.3	2080
32 x 3 x 1	1.3	0.5	2.0	0.4	1.5	40.1 ± 1.2	18.3	2190
37 x 3 x 1	1.3	0.5	2.1	0.4	1.6	42.2 ± 1.2	18.3	2470
1 x 3 x 1.5	1.6	0.6	1.1	0.2	0.9	11.7 ± 0.8	12.1	210
2 x 3 x 1.5	1.6	0.6	1.2	0.3	1.0	17.1 ± 0.8	12.2	370
3 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	18.2 ± 0.8	12.2	450
4 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	19.6 ± 0.8	12.2	540
7 x 3 x 1.5	1.6	0.6	1.5	0.3	1.2	24.5 ± 1	12.2	840
8 x 3 x 1.5	1.6	0.6	1.6	0.3	1.2	26.1 ± 1	12.2	940
10 x 3 x 1.5	1.6	0.6	1.7	0.3	1.3	29.4 ± 1	12.2	1130
12 x 3 x 1.5	1.6	0.6	1.7	0.3	1.3	30.8 ± 1	12.2	1270
14 x 3 x 1.5	1.6	0.6	1.8	0.3	1.3	32.2 ± 1	12.2	1430

TIOI(c) 250V, TICI(c) 250V Cu/XLPE/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Laying up	Laying up of pairs/triples/quads
Inner sheath	Collective screen (Al/PET + tinned copper drain wire)
Armour	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360
Bedding	Plain/tinned copper wire braid or galvanised steel wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

- Capacitance, nom. 800Hz
- Loop Inductance, nom.
- Insulation resistance at 20 °C

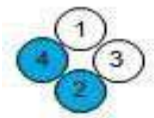
Unit	0.75 mm²
nF/km	24.5
mH/km	0.7
MOhm.km	≥3670

Pair identification:

- The pairs have the following number identification:

Pair no. 1	core no. 1 & 2
Pair no. 2	core no. 3 & 4
Pair no. 3	core no. 5 & 6
Pair no. 4	etc

- Triple cable is identified with no. 1, 2 and 3.
- Quad cable has the following identification



TIOI(c) 250V, TICI(c) 250V Cu/XLPE/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	1.0	0.2	0.8	9.8 ± 0.5	24.5	140
2 x 2 x 0.75	1.1	0.5	1.1	0.3	0.9	13.5 ± 0.8	24.8	230
3 x 2 x 0.75	1.1	0.5	1.1	0.3	0.9	14.1 ± 0.8	24.8	260
4 x 2 x 0.75	1.1	0.5	1.2	0.3	0.9	15.1 ± 0.8	24.8	300
7 x 2 x 0.75	1.1	0.5	1.2	0.3	1.0	17.3 ± 0.8	24.8	400
8 x 2 x 0.75	1.1	0.5	1.3	0.3	1.0	18.4 ± 0.8	24.8	450
10 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	20.5 ± 1	24.8	540
12 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	21.2 ± 1	24.8	590
14 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	21.9 ± 1	24.8	640
16 x 2 x 0.75	1.1	0.5	1.5	0.3	1.1	23.4 ± 1	24.8	720
19 x 2 x 0.75	1.1	0.5	1.5	0.3	1.1	24.3 ± 1	24.8	800
24 x 2 x 0.75	1.1	0.5	1.6	0.3	1.2	27.3 ± 1	24.8	970
30 x 2 x 0.75	1.1	0.5	1.7	0.3	1.3	30.2 ± 1	24.8	1180
32 x 2 x 0.75	1.1	0.5	1.7	0.3	1.3	30.8 ± 1	24.8	1230
37 x 2 x 0.75	1.1	0.5	1.8	0.3	1.3	32.2 ± 1	24.8	1370
1 x 2 x 1	1.3	0.5	1.0	0.2	0.8	10.2 ± 0.8	18.1	160
2 x 2 x 1	1.3	0.5	1.1	0.3	0.9	14.3 ± 0.8	18.3	260
3 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.2 ± 0.8	18.3	300
4 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.9 ± 0.8	18.3	340
7 x 2 x 1	1.3	0.5	1.3	0.3	1.0	18.5 ± 0.8	18.3	470
8 x 2 x 1	1.3	0.5	1.3	0.3	1.0	19.5 ± 0.8	18.3	520
10 x 2 x 1	1.3	0.5	1.4	0.3	1.1	21.8 ± 1	18.3	620
12 x 2 x 1	1.3	0.5	1.4	0.3	1.1	22.5 ± 1	18.3	690
14 x 2 x 1	1.3	0.5	1.5	0.3	1.1	23.4 ± 1	18.3	760
16 x 2 x 1	1.3	0.5	1.5	0.3	1.2	25.1 ± 1	18.3	850
19 x 2 x 1	1.3	0.5	1.6	0.3	1.2	26.2 ± 1	18.3	960
24 x 2 x 1	1.3	0.5	1.7	0.3	1.3	29.5 ± 1	18.3	1180
30 x 2 x 1	1.3	0.5	1.8	0.3	1.3	32.6 ± 1	18.3	1420
32 x 2 x 1	1.3	0.5	1.8	0.3	1.4	33.3 ± 1	18.3	1490
37 x 2 x 1	1.3	0.5	1.9	0.4	1.4	35.3 ± 1.2	18.3	1740
1 x 2 x 1.5	1.6	0.6	1.0	0.2	0.8	11.2 ± 0.8	12.1	190
2 x 2 x 1.5	1.6	0.6	1.2	0.3	1.0	16.2 ± 0.8	12.2	320
3 x 2 x 1.5	1.6	0.6	1.2	0.3	1.0	17.0 ± 0.8	12.2	370
4 x 2 x 1.5	1.6	0.6	1.3	0.3	1.0	18.1 ± 0.8	12.2	440
7 x 2 x 1.5	1.6	0.6	1.4	0.3	1.1	21.4 ± 1	12.2	630
8 x 2 x 1.5	1.6	0.6	1.4	0.3	1.1	22.6 ± 1	12.2	690
10 x 2 x 1.5	1.6	0.6	1.5	0.3	1.2	25.3 ± 1	12.2	830
12 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	26.4 ± 1	12.2	930

TIOI(c) 250V, TICI(c) 250V Cu/XLPE/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
14 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	27.2 ± 1	12.2	1020
16 x 2 x 1.5	1.6	0.6	1.7	0.3	1.3	29.4 ± 1	12.2	1160
19 x 2 x 1.5	1.6	0.6	1.7	0.3	1.3	30.5 ± 1	12.2	1300
24 x 2 x 1.5	1.6	0.6	1.9	0.4	1.4	35.0 ± 1	12.2	1690
30 x 2 x 1.5	1.6	0.6	2.0	0.4	1.5	38.9 ± 1.2	12.2	2040
32 x 2 x 1.5	1.6	0.6	2.0	0.4	1.5	39.5 ± 1.2	12.2	2130
37 x 2 x 1.5	1.6	0.6	2.1	0.4	1.6	41.6 ± 1.2	12.2	2400
1 x 3 x 0.75	1.1	0.5	1.0	0.2	0.8	10.1 ± 0.8	24.5	160
2 x 3 x 0.75	1.1	0.5	1.1	0.3	0.9	14.4 ± 0.8	24.8	270
3 x 3 x 0.75	1.1	0.5	1.2	0.3	0.9	15.2 ± 0.8	24.8	310
4 x 3 x 0.75	1.1	0.5	1.2	0.3	1.0	16.3 ± 0.8	24.8	370
7 x 3 x 0.75	1.1	0.5	1.3	0.3	1.0	19.6 ± 0.8	24.8	530
8 x 3 x 0.75	1.1	0.5	1.4	0.3	1.1	21.1 ± 1	24.8	600
10 x 3 x 0.75	1.1	0.5	1.5	0.3	1.1	23.5 ± 1	24.8	710
12 x 3 x 0.75	1.1	0.5	1.5	0.3	1.2	24.8 ± 1	24.8	800
14 x 3 x 0.75	1.1	0.5	1.5	0.3	1.2	25.6 ± 1	24.8	880
16 x 3 x 0.75	1.1	0.5	1.6	0.3	1.2	27.1 ± 1	24.8	980
19 x 3 x 0.75	1.1	0.5	1.7	0.3	1.3	29.3 ± 1	24.8	1140
24 x 3 x 0.75	1.1	0.5	1.8	0.3	1.3	32.1 ± 1	24.8	1360
30 x 3 x 0.75	1.1	0.5	1.9	0.4	1.4	35.7 ± 1.2	24.8	1720
32 x 3 x 0.75	1.1	0.5	1.9	0.4	1.4	36.8 ± 1.2	24.8	1810
37 x 3 x 0.75	1.1	0.5	2.0	0.4	1.5	38.7 ± 1.2	24.8	2030
1 x 3 x 1	1.3	0.5	1.0	0.2	0.8	10.6 ± 0.8	18.1	180
2 x 3 x 1	1.3	0.5	1.2	0.3	0.9	15.5 ± 0.8	18.3	310
3 x 3 x 1	1.3	0.5	1.2	0.3	1.0	16.3 ± 0.8	18.3	360
4 x 3 x 1	1.3	0.5	1.3	0.3	1.0	17.6 ± 0.8	18.3	430
7 x 3 x 1	1.3	0.5	1.4	0.3	1.1	21.4 ± 1	18.3	640
8 x 3 x 1	1.3	0.5	1.4	0.3	1.1	22.6 ± 1	18.3	700
10 x 3 x 1	1.3	0.5	1.5	0.3	1.2	25.4 ± 1	18.3	850
12 x 3 x 1	1.3	0.5	1.6	0.3	1.2	26.8 ± 1	18.3	960
14 x 3 x 1	1.3	0.5	1.6	0.3	1.2	27.8 ± 1	18.3	1060
16 x 3 x 1	1.3	0.5	1.7	0.3	1.3	29.6 ± 1	18.3	1190
19 x 3 x 1	1.3	0.5	1.8	0.3	1.3	31.8 ± 1	18.3	1370
24 x 3 x 1	1.3	0.5	1.9	0.4	1.4	35.4 ± 1.2	18.3	1740
30 x 3 x 1	1.3	0.5	2.0	0.4	1.5	39.0 ± 1.2	18.3	2090
32 x 3 x 1	1.3	0.5	2.0	0.4	1.5	40.2 ± 1.2	18.3	2200
37 x 3 x 1	1.3	0.5	2.1	0.4	1.6	42.3 ± 1.2	18.3	2480

TIOI(c) 250V, TICI(c) 250V Cu/XLPE/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20° C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 1.5	1.6	0.6	1.1	0.2	0.9	11.8 ± 0.8	12.1	220
2 x 3 x 1.5	1.6	0.6	1.2	0.3	1.0	17.2 ± 0.8	12.2	380
3 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	18.3 ± 0.8	12.2	460
4 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	19.7 ± 0.8	12.2	550
7 x 3 x 1.5	1.6	0.6	1.5	0.3	1.2	24.6 ± 1	12.2	850
8 x 3 x 1.5	1.6	0.6	1.6	0.3	1.2	26.2 ± 1	12.2	950
10 x 3 x 1.5	1.6	0.6	1.7	0.3	1.3	29.5 ± 1	12.2	1140
12 x 3 x 1.5	1.6	0.6	1.7	0.3	1.3	30.9 ± 1	12.2	1280
14 x 3 x 1.5	1.6	0.6	1.8	0.3	1.3	32.3 ± 1	12.2	1440
16 x 3 x 1.5	1.6	0.6	1.8	0.3	1.4	34.2 ± 1	12.2	1610
19 x 3 x 1.5	1.6	0.6	1.9	0.4	1.5	37.3 ± 1.2	12.2	1940
24 x 3 x 1.5	1.6	0.6	2.1	0.4	1.5	41.1 ± 1.2	12.2	2360
30 x 3 x 1.5	1.6	0.6	2.2	0.4	1.6	45.3 ± 1.2	12.2	2850
32 x 3 x 1.5	1.6	0.6	2.3	0.4	1.7	47.1 ± 1.2	12.2	3050
37 x 3 x 1.5	1.6	0.6	2.4	0.4	1.7	49.3 ± 1.2	12.2	3410

TIOI(i & c) 250V, TICI(i & c) 250V Cu/XLPE/ISCR/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Application:

- Used in the ships for instrumentation and communication. Also can be used for other indoor and outdoor applications

Standard:

IEC 60092-376	Design guidelines
IEC 60228	Conductor
IEC 60092-360	Insulation & sheath
IEC 60332-1-2	Flame retardant properties
IEC 60332-3-22	Flame retardant properties
IEC 60754-1,2	Halogen free properties
IEC 61034-1,2	Smoke emission properties

Construction:

Conductor	Plain or tinned annealed copper, IEC 60228 class 2 or class 5
Insulation	Halogen free cross-linked polyethylene XLPE, IEC 60092-360
Screen	Individual screen (Al/PET + tinned copper drain wire)
Laying up	Laying up of pairs/triples/quads
Screen	Collective screen (Al/PET + tinned copper drain wire)
Bedding	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360
Armour	Plain/tinned copper wire braid or galvanised steel wire braid
Outer sheath	Flame retardant halogen free polyolefin compound, SHF1, IEC 60092-360

Electrical characteristics:

Unit	0.75mm^2
nF/km	24.5
mH/km	0.7
MOhm.km	≥3670

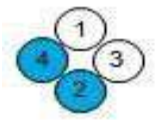
- Capacitance, nom. 800Hz
- Loop Inductance, nom.
- Insulation resistance at 20 °C

Pair identification:

- The pairs have the following number identification:

Pair no. 1	core no. 1 & 2
Pair no. 2	core no. 3 & 4
Pair no. 3	core no. 5 & 6
Pair no. 4	etc

- Triple cable is identified with no. 1, 2 and 3.



- Quad cable has the following identification

TIOI(i & c) 250V, TICI(i & c) 250V Cu/XLPE/ISCR/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 2 x 0.75	1.1	0.5	1.0	0.2	0.8	10.1 ± 0.8	24.5	155
2 x 2 x 0.75	1.1	0.5	1.1	0.3	0.9	14.1 ± 0.8	24.8	260
3 x 2 x 0.75	1.1	0.5	1.2	0.3	0.9	15.0 ± 0.8	24.8	300
4 x 2 x 0.75	1.1	0.5	1.2	0.3	1.0	16.1 ± 0.8	24.8	350
7 x 2 x 0.75	1.1	0.5	1.3	0.3	1.0	18.2 ± 0.8	24.8	480
8 x 2 x 0.75	1.1	0.5	1.3	0.3	1.0	19.6 ± 0.8	24.8	540
10 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	22.1 ± 1	24.8	650
12 x 2 x 0.75	1.1	0.5	1.4	0.3	1.1	22.8 ± 1	24.8	710
14 x 2 x 0.75	1.1	0.5	1.5	0.3	1.1	23.9 ± 1	24.8	790
16 x 2 x 0.75	1.1	0.5	1.5	0.3	1.2	25.5 ± 1	24.8	890
19 x 2 x 0.75	1.1	0.5	1.6	0.3	1.2	26.2 ± 1	24.8	990
24 x 2 x 0.75	1.1	0.5	1.7	0.3	1.3	30.1 ± 1	24.8	1240
30 x 2 x 0.75	1.1	0.5	1.8	0.3	1.3	32.0 ± 1	24.8	1450
32 x 2 x 0.75	1.1	0.5	1.8	0.3	1.3	32.4 ± 1	24.8	1510
37 x 2 x 0.75	1.1	0.5	1.8	0.3	1.4	34.1 ± 1	24.8	1690
1 x 2 x 1	1.3	0.5	1.0	0.2	0.8	10.5 ± 0.8	18.1	160
2 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.1 ± 0.8	18.3	300
3 x 2 x 1	1.3	0.5	1.2	0.3	0.9	15.8 ± 0.8	18.3	340
4 x 2 x 1	1.3	0.5	1.2	0.3	1.0	16.9 ± 0.8	18.3	400
7 x 2 x 1	1.3	0.5	1.3	0.3	1.0	19.2 ± 0.8	18.3	550
8 x 2 x 1	1.3	0.5	1.4	0.3	1.1	21.1 ± 1	18.3	640
10 x 2 x 1	1.3	0.5	1.5	0.3	1.1	23.6 ± 1	18.3	760
12 x 2 x 1	1.3	0.5	1.5	0.3	1.2	24.5 ± 1	18.3	850
14 x 2 x 1	1.3	0.5	1.5	0.3	1.2	25.6 ± 1	18.3	950
16 x 2 x 1	1.3	0.5	1.6	0.3	1.2	27.3 ± 1	18.3	1060
19 x 2 x 1	1.3	0.5	1.6	0.3	1.2	27.8 ± 1	18.3	1160
24 x 2 x 1	1.3	0.5	1.8	0.3	1.3	32.2 ± 1	18.3	1470
30 x 2 x 1	1.3	0.5	1.8	0.3	1.4	34.2 ± 1	18.3	1740
32 x 2 x 1	1.3	0.5	1.9	0.4	1.4	35.3 ± 1.2	18.3	1910
37 x 2 x 1	1.3	0.5	1.9	0.4	1.5	37.1 ± 1.2	18.3	2140
1 x 2 x 1.5	1.6	0.6	1.0	0.2	0.8	11.5 ± 0.8	12.1	190
2 x 2 x 1.5	1.6	0.6	1.2	0.3	1.0	16.9 ± 0.8	12.2	360
3 x 2 x 1.5	1.6	0.6	1.3	0.3	1.0	17.9 ± 0.8	12.2	430
4 x 2 x 1.5	1.6	0.6	1.3	0.3	1.0	19.2 ± 0.8	12.2	500
7 x 2 x 1.5	1.6	0.6	1.4	0.3	1.1	22.1 ± 1	12.2	710
8 x 2 x 1.5	1.6	0.6	1.5	0.3	1.1	24.1 ± 1	12.2	810
10 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	27.2 ± 1	12.2	980
12 x 2 x 1.5	1.6	0.6	1.6	0.3	1.2	28.1 ± 1	12.2	1090
14 x 2 x 1.5	1.6	0.6	1.7	0.3	1.3	29.8 ± 1	12.2	1240
16 x 2 x 1.5	1.6	0.6	1.8	0.3	1.3	31.8 ± 1	12.2	1390
19 x 2 x 1.5	1.6	0.6	1.8	0.3	1.3	32.4 ± 1	12.2	1540
24 x 2 x 1.5	1.6	0.6	2.0	0.4	1.5	38.2 ± 1.2	12.2	2040
30 x 2 x 1.5	1.6	0.6	2.1	0.4	1.5	40.5 ± 1.2	12.2	2400
32 x 2 x 1.5	1.6	0.6	2.1	0.4	1.6	41.3 ± 1.2	12.2	2520
37 x 2 x 1.5	1.6	0.6	2.2	0.4	1.6	43.4 ± 1.2	12.2	2820

TIOI(i & c) 250V, TICI(i & c) 250V Cu/XLPE/ISCR/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 0.75	1.1	0.5	1.0	0.2	0.8	10.4 ± 0.8	24.5	170
2 x 3 x 0.75	1.1	0.5	1.2	0.3	0.9	15.0 ± 0.8	24.8	300
3 x 3 x 0.75	1.1	0.5	1.2	0.3	0.9	15.7 ± 0.8	24.8	350
4 x 3 x 0.75	1.1	0.5	1.2	0.3	1.0	16.9 ± 0.8	24.8	410
7 x 3 x 0.75	1.1	0.5	1.4	0.3	1.1	20.7 ± 1	24.8	620
8 x 3 x 0.75	1.1	0.5	1.4	0.3	1.1	21.9 ± 1	24.8	680
10 x 3 x 0.75	1.1	0.5	1.5	0.3	1.2	24.6 ± 1	24.8	820
12 x 3 x 0.75	1.1	0.5	1.6	0.3	1.2	26.0 ± 1	24.8	930
14 x 3 x 0.75	1.1	0.5	1.6	0.3	1.2	26.9 ± 1	24.8	1020
16 x 3 x 0.75	1.1	0.5	1.6	0.3	1.2	28.3 ± 1	24.8	1130
19 x 3 x 0.75	1.1	0.5	1.7	0.3	1.3	30.6 ± 1	24.8	1310
24 x 3 x 0.75	1.1	0.5	1.8	0.3	1.4	33.7 ± 1	24.8	1590
30 x 3 x 0.75	1.1	0.5	1.9	0.4	1.5	37.5 ± 1.2	24.8	2000
32 x 3 x 0.75	1.1	0.5	2.0	0.4	1.5	38.9 ± 1.2	24.8	2130
37 x 3 x 0.75	1.1	0.5	2.1	0.4	1.5	40.7 ± 1.2	24.8	2370
1 x 3 x 1	1.3	0.5	1.0	0.2	0.8	10.9 ± 0.8	18.1	190
2 x 3 x 1	1.3	0.5	1.2	0.3	0.9	15.9 ± 0.8	18.3	340
3 x 3 x 1	1.3	0.5	1.2	0.3	1.0	16.7 ± 0.8	18.3	400
4 x 3 x 1	1.3	0.5	1.3	0.3	1.0	18.1 ± 0.8	18.3	480
7 x 3 x 1	1.3	0.5	1.4	0.3	1.1	22.1 ± 1	18.3	720
8 x 3 x 1	1.3	0.5	1.5	0.3	1.1	23.6 ± 1	18.3	810
10 x 3 x 1	1.3	0.5	1.6	0.3	1.2	26.5 ± 1	18.3	970
12 x 3 x 1	1.3	0.5	1.6	0.3	1.2	27.8 ± 1	18.3	1100
14 x 3 x 1	1.3	0.5	1.7	0.3	1.3	29.2 ± 1	18.3	1240
16 x 3 x 1	1.3	0.5	1.7	0.3	1.3	30.8 ± 1	18.3	1360
19 x 3 x 1	1.3	0.5	1.8	0.3	1.4	33.2 ± 1	18.3	1600
24 x 3 x 1	1.3	0.5	1.9	0.4	1.5	37.1 ± 1.2	18.3	2010
30 x 3 x 1	1.3	0.5	2.1	0.4	1.5	40.8 ± 1.2	18.3	2430
32 x 3 x 1	1.3	0.5	2.1	0.4	1.6	42.3 ± 1.2	18.3	2600
37 x 3 x 1	1.3	0.5	2.2	0.4	1.6	44.3 ± 1.2	18.3	2900

TIOI(i & c) 250V, TICI(i & c) 250V Cu/XLPE/ISCR/OSCR/HF/CWB or SWB/HF

Armoured Instrumentation Cable

Max. conductor temperature: 90°C

Range and dimensions

Number of pairs x conductor cross-section	Conductor diameter	Insulation thickness	Inner covering diameter	Armour wire diameter	Outer sheath thickness	Outer sheath diameter	Resistance at 20°C Max.	Weight Approx.
mm^2	mm	mm	mm	mm	mm	mm	Ohm/km	kg/km
1 x 3 x 1.5	1.6	0.6	1.1	0.3	0.9	12.3 ± 0.8	12.1	220
2 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	17.9 ± 0.8	12.2	410
3 x 3 x 1.5	1.6	0.6	1.3	0.3	1.0	18.8 ± 0.8	12.2	500
4 x 3 x 1.5	1.6	0.6	1.4	0.3	1.1	20.7 ± 1	12.2	610
7 x 3 x 1.5	1.6	0.6	1.5	0.3	1.2	25.3 ± 1	12.2	940
8 x 3 x 1.5	1.6	0.6	1.6	0.3	1.2	27.0 ± 1	12.2	1040
10 x 3 x 1.5	1.6	0.6	1.7	0.3	1.3	30.4 ± 1	12.2	1260
12 x 3 x 1.5	1.6	0.6	1.8	0.3	1.3	32.1 ± 1	12.2	1440
14 x 3 x 1.5	1.6	0.6	1.8	0.3	1.4	33.5 ± 1	12.2	1620
16 x 3 x 1.5	1.6	0.6	1.9	0.4	1.4	35.9 ± 1.2	12.2	1890
19 x 3 x 1.5	1.6	0.6	2.0	0.4	1.5	38.8 ± 1.2	12.2	2170
24 x 3 x 1.5	1.6	0.6	2.1	0.4	1.6	42.8 ± 1.2	12.2	2660
30 x 3 x 1.5	1.6	0.6	2.3	0.4	1.7	47.3 ± 1.2	12.2	3240
32 x 3 x 1.5	1.6	0.6	2.4	0.4	1.7	49.0 ± 1.2	12.2	3440
37 x 3 x 1.5	1.6	0.6	2.4	0.4	1.8	51.3 ± 1.2	12.2	3850

Zarsim Co.

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