



Zarsim Marine Cables

Where do you want to go today?

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.



Cable Types

Cable Types		Designation		
Power and Control Cable	Flame Retardant	TI 0.6/1 kV	Cu/XLPE/HF	
		TFOI 0.6/1 kV	Cu/XLPE/BED/CWB/HF	
		TIOI 0.6/1 kV, TICI 0.6/1 kV	Cu/XLPE/HF/CWB or SWB/HF	
	Fire Resistant	BI 0.6/1 kV	Cu/MGT/XLPE/HF	
		BFOI 0.6/1 kV	Cu/MGT/XLPE/BED/CWB/HF	
		BIOI 0.6/1 kV, BICI 0.6/1 kV	Cu/MGT/XLPE/HF/CWB or SWB/HF	
	Instrumentation Cable	Flame Retardant	TI 250V	Cu/XLPE/HF
			TI(c) 250V	Cu/XLPE/OSCR/HF
			TI(i & c) 250V	Cu/XLPE/ISCR/OSCR/HF
			TFOI 250V	Cu/XLPE/BED/CWB/HF
TFOI(c) 250V			Cu/XLPE/OSCR/BED/CWB/HF	
TFOI(i & c) 250V			Cu/XLPE/ISCR/OSCR/BED/CWB/HF	
TIOI 250V, TICI 250V			Cu/XLPE/HF/CWB or SWB/HF	
TIOI(c) 250V, TICI(c) 250V			Cu/XLPE/OSCR/HF/CWB or SWB/HF	
TIOI(i & c) 250V, TICI(i & c) 250V		Cu/XLPE/ISCR/OSCR/HF/CWB or SWB/HF		
Fire Resistant		BI 250V	Cu/MGT/XLPE/HF	
		BI(c) 250V	Cu/MGT/XLPE/OSCR/HF	
		BI(i & c) 250V	Cu/MGT/XLPE/ISCR/OSCR/HF	
		BFOI 250V	Cu/MGT/XLPE/BED/CWB/HF	
		BFOI(c) 250V	Cu/MGT/XLPE/OSCR/BED/CWB/HF	
		BFOI(i & c) 250V	Cu/MGT/XLPE/ISCR/OSCR/BED/CWB/HF	
		BIOI 250V, BICI 250V	Cu/MGT/XLPE/HF/CWB or SWB/HF	
	BIOI(c) 250V, BICI(c) 250V	Cu/MGT/XLPE/OSCR/HF/CWB or SWB/HF		
BIOI(i & c) 250V, BICI(i & c) 250V	Cu/MGT/XLPE/ISCR/OSCR/HF/CWB or SWB/HF			

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



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

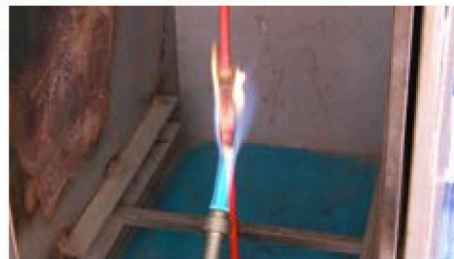
The armouring material can be plain or tinned copper wire, galvanised steel wire and phosphor bronze wire. The armour gives the cable mechanical protection. The use of copper in the armour performs a dual function as it behaves as armour but also as a screen.

▪ Quality Control

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

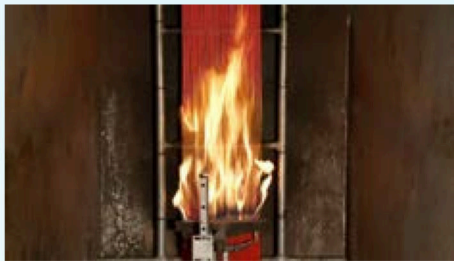
▪ ZFire Testing Methods

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.



Marine Cables

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.



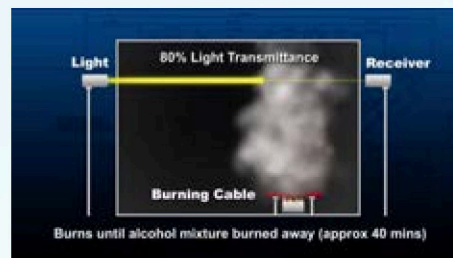
Fire resistance tests are aimed at verifying the circuit integrity behaviour of a cable under fire conditions. The main three different test methods are IEC 60331-21 or IEC 60331-1 or IEC 60331-2, used for power and control cables. Marine cable standards require the IEC 60331-21 test, where the cable 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



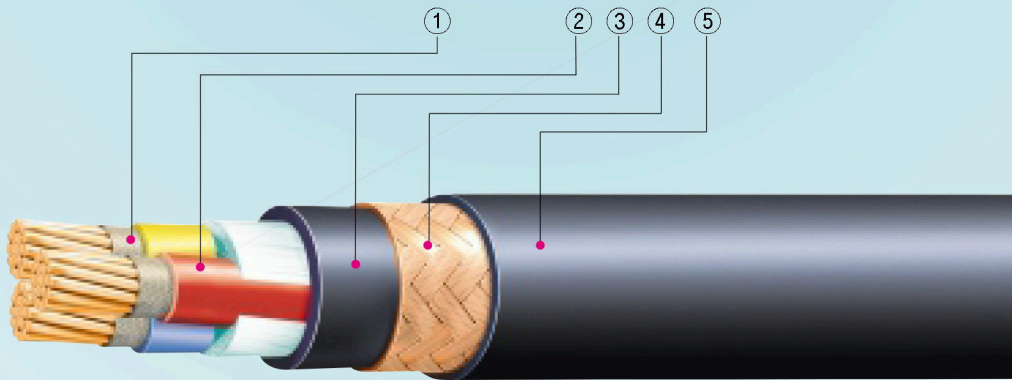
IEC 60331-1 test, or for diameter not exceeding 20 mm IEC 60331-2, in which a bent cable, affected by mechanical shock, is subjected to a 830 °C flame for minimum 90 minutes.

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" (3m x 3m x 3 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.)





	Construction	Letter	Meaning	Remarks
1 st	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
2 nd	Inner covering (Inner sheath)	F	Bedding or taping	
		I	Thermoplastic compound	IEC 60092-360 SHF1
3 rd	Armour	O	Copper wire braid	
		C	Galvanised steel wire braid	
		X	No armour	
4 th	Outer sheath	B	Mud resistant type	IEC 60092-360 SE1
		I	Thermoplastic compound	IEC 60092-360 SHF1
		U	Halogen free thermoset compound	IEC 60092-360 SHF2
5 th	Screen	(i)	Individual screen	
		(c)	Collective screen	
		(i/c)	Individual & collective screen	

Zarsim Co.

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Think Different
Make a Difference

