

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Lightweight Electric Cable**with type designation(s)
HF-FTFT, HF-FTFT(C), HF-FTFT(I), HF-FTFT(I/C)

Issued to

Kukdong Electric Wire Co., Ltd.
Jincheon-gun Chungcheongbuk-do, Korea

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Applicable for Power & Control cables for combustion engines.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Rated voltage (kV) 0.6/1****Temp. class (°C) 90**Issued at **Busan** on **2018-01-29**This Certificate is valid until **2023-01-28**.for **DNV GL**DNV GL local station: **Seoul**Approval Engineer: **Eun Jin Lee**

Michael Jost Auf der Stroth
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Type : HF-FTFT, HF-FTFT(C), HF-FTFT(I), HF-FTFT(I/C)

Conductor : Stranded tinned copper, Class 5
Insulation : High temperature thermoplastic elastomer
Screen : Individual(I), Collective(C) :
Al/mylar tape with tinned copper drain wire
Collective braid screen : Tinned annealed copper wire braid
Outer sheath : SHF2

HF-FTFT		HF-FTFT(C)		HF-FTFT(I), HF-FTFT(I/C)	
Conductor cross section (mm ²)	No. of cores	Conductor cross section (mm ²)	No. of pairs	Conductor cross section (mm ²)	No. of pairs
0.5	2~50	0.5	1~37	0.5	2~37
0.75		0.75		0.75	
1.0		1.0		1.0	
1.5		1.5		1.5	
2.5		2.5		2.5	

Application/Limitation

Applicable for power & control cables for combustion engines.

The requirement of SOLAS Amendmenets Chapter II-1, Part D, Reg. 45, 5.2(provision to be taken to limit Fire Propagation along Bunches of cables or wires) are fulfilled without any additional measures.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0400	2015-12	DNVGL Type approval programme	Except Scrape abrasion resistance
IEC 60092-360	2014-04	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation, telecommunication cables	
IEC 60332-3-25	2009-02	Tests on electric and optical fibre cables under fire conditions	Bunch test Category D
BS 3G 230	2001-12	Fluid immersion	72hrs at 70°C -IRM902 -Diesel(F-76), 3.5% salt water
IEC 60811-404	2012-03	Fluid immersion	24hrs at 70°C -Fuel F
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the amount of halogen acid gas	Low Halogen <0,5%
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free ≥4,3pH, ≤10µS/mm

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Standard	Release	General description	Limitation
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test.	Fluorine content <0,1%
NES 713	2000-04	Determination of the toxicity index of the products of combustion from small specimens of materials	Max.5
ISO 5659-2	2006-04	Smoke emission-small scale	Ds4 150 max and Dmax 150. VOF4 max.300
IEC 61034-2	2013-06	Smoke emission – large scale	Min. 70%
IEC 60811-506	2012-03	Impact test at low temperature for insulations and sheaths	Cold impact: -35°C
CSA C22.2 No.03	2009-09	5.11 Flexibility at any specified temperature	Cold bending :-40°C

Marking of product

0.6/1kV – Type designation – Flame retardant Cat.D – Size – Kukdong – Year of manufacture – Length

Periodical assessment

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available, tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE