DNV·GL

Certificate No:
TAE000015M

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
FireKab BFOI FE180, FireKab BFCI FE180

Issued to
2 M Kablo Sanayi ve Ticaret A.S
Istanbul, Turkey

is found to comply with
DNV GL rules for classification – Ships and offshore units
DNV GL class programme DNVGL-CP-0399 – Type approval – Electric cables

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type	Voltage class (V)	Temp. class (°C)
FireKab BFOI FE180	**250V**	**90**
FireKab BFCI FE180	**250V**	**90**

This Certificate is valid until **2021-07-03**.
Issued at **Høvik** on **2016-07-04**

DNV GL local station: **Istanbul**

Approval Engineer: **Georgy Abramenko**

for **DNV GL**
Digitally Signed By: Sjåvåg, Trond
Location: DNV GL Høvik, Norway
Signing Date: 2016-07-05, on behalf of

Marit Laumann
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.

Job Id: **262.1-017524-2**
Certificate No: **TAE000015M**

Product description

BFOI / BFCI 250 V

Construction:

Conductors:	Plain annealed stranded copper class 2 or tinned copper class 5
Core insulation:	Mica tape + XLPE
Lay-Up	Pairs/triples/quads are stranded in layers
Inner sheath/ separator:	Halogen free filler or polyester tape
Screen/ Armour:	Copper wire braiding and drain wire
Outer sheath:	SHF1

	No of Elements:	Cross sectional area [mm^2]
Pairs	1 2 3 4 5 7 10 12 16 19 24 27 37	0,5 0,75 1 1,5 2,5
Triads	1 2 3 4 5 7 10	0,5 0,75 1 1,5 2,5
Quads	1 2 3 4 5 7	0,5 0,75 1 1,5 2,5

Application/Limitation

This cable is fire resistant according to IEC 60331.

The requirements of SOLAS Amendments 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

Data sheet: 2M Kablo datasheet ref. no. 0158-4-15, date 18.01.2016
Test reports: 2M Kablo test reports, ref. techdocs 24-32, received 03.06.2016.

Tests carried out

Standard	Issued	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
IEC 60331-21	1999-04	Fire resistance / Circuit integrity – Test for electric cables under fire conditions-Circuit integrity – Part 21	
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830ºC for cables rated up to and including 0,6/1 kV	Minimum 90 minutes flame application + 15 minutes cooling down
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A	Bunch test Category A

Standard	Issued	General description	Limitation
IEC 60332-1-2	2006-07	Tests on electric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	
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% Halogen
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: pH > 4,3 Conductivity < 10µS
IEC 61034-1/2	2013-07/09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke

Marking of product

2M Kablo IEC 60092-376 – BFOI – 150/250 V – IEC 60332-3-22 – IEC 60331 – meters – year, or:
2M Kablo IEC 60092-376 - BFCI – 150/250 V – IEC 60332-3-22 – IEC 60331 – meters – year.

Periodical assessment

The scope of the Periodical assessment 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 Periodical assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment shall be performed at least every second year.

END OF CERTIFICATE