DNV·GL

Certificate No:
TAE00000NJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
MG - Fire resistant. Flame retardant Halogen free Low smoke 0,6/1kV

Issued to
TELDOR Cables & Systems Ltd.
Israel, Israel

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

Control and Instrumentation.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.
Voltage class (V) 600/1000
Temp. class (°C) 90

This Certificate is valid until **2020-11-29**.
Issued at **Høvik** on **2015-12-21**
DNV GL local station: **Haifa** for **DNV GL**

Approval Engineer: **Ivar Bull**

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.

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Job Id: **262.1-020617-1**
Certificate No: **TAE00000NJ**

Product description

Type: MG - Fire resistant. Flame retardant Halogen free Low smoke 0,6/1kV

Construction:

Conductor:	Plain or tinned copper Class 2 or Class 5
Insulation:	HF90
Inner covering:	Lapped
Individual screen:	Aluminium/polyester tape with tinned copper drain wire
Collective screen:	Aluminium/polyester tape with tinned copper drain wire
Outer sheath:	SHF1 or SHF2 or SHF2 MUD

No of cores:	Cross sectional area [mm^{2}]
1-37	1 1,5 2,5

No of Pairs:	Cross sectional area [mm^{2}]
2-27	1
2-23	1,5
2-19	2,5

No of Triads:	Cross sectional area [mm^{2}]
1-27	1
1-21	1,5
1-16	2,5

Cables may also include combinations of above elements.
Fictitious calculations shall be performed as if all elements were of the larger size.

Application/Limitation

This cable type 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

Tests carried out

Standard	Release	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)	Increased insulation thickness and voltage level 0,6/1kV
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 120 min with mechanical shock

Standard	Release	General description	Limitation
IEC 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	
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
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
NEK 606 Ed. 4	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Oil based mud: Carbo Sea 70°C 56d or EDC 95/11 70°C 56d

Marking of product

TELDOR EC-[...] MG - Number & Type of units 0.6/1 (1.2) kV, P/N, B/N, METER MARK - IEC 60092-376-IEC 60331-1/21 - IEC 60332-3-22

Periodical assessment

The scope of the periodical assessment 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 periodical assessment 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 to be performed at least every second year.

END OF CERTIFICATE