DNV·GL

Certificate No:
**TAE000020S**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Data transmission cables and systems**

with type designation(s)
**Armoured coaxial cables MG RG58, MG RG59, MG RG213, MG RG214, MG RG11, MG RG6**

Issued to
## TELDOR Cables & Systems Ltd.
**Israel**, **Israel**

is found to comply with
**DNV GL rules for classification – Ships, offshore units, and high speed and light craft**

## Application :

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

Issued at **Høvik** on **2017-07-12**
This Certificate is valid until **2022-06-11**.
DNV GL local station: **Haifa**

Approval Engineer: **Ivar Bull**

for **DNV GL**

**Andreas Kristoffersen**
**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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## Product description

Coaxial cables.

| Construction / Characteristics | RG58 | RG59 | RG213 | RG214 | RG6 | RG11 |
|---|---|---|---|---|---|---|
| **Impedance (nominal)** | 50 Ohm | 75 Ohm | 50 Ohm | 50 Ohm | 75 Ohm | 75 Ohm |
| **Inner Conductor type** | Annealed tinned / Bare Copper | Annealed tinned / Bare Copper | Annealed tinned / Bare Copper | Silver plated Copper | Copper Clad | Annealed tinned / Bare Copper |
| **Conductor construction** | 19x0.18mm / solid 0.9mm | Stranded or Solid 0.57mm | 7x0.75mm | 7x0.75mm | 0.72+0.025 mm Solid | 7x0.4mm |
| **Insulation material** | PE | PE | PE | PE | PE | PE |
| **Insulation diameter (nominal)** | 2.95mm | 3.71mm | 7.24mm | 7.24mm | 4.57mm | 7.24mm |
| **Shield** | Braided annealed tinned / bare copper | Braided annealed tinned / bare copper | Braided annealed tinned / bare copper | Silver plated Copper / Braided annealed tinned / bare copper | Aluminum Braid + Al/PE/Al tape | Braided annealed tinned / bare copper |
| **Shield/Braid conductor** | 0.127mm | 0.160mm | 0.18mm | 0.16mm | -- | 0.16mm |
| **Jacket / sheath material** | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD |
| **Jacket/sheath diameter (nominal)** | 4.95mm | 6.15mm | 10.3mm | 10.8mm | 7.0mm | 10.3mm |
| **Armor (See below)** | Braiding / Wires / Tape | Braiding / Wires / Tape | Braiding / Wires / Tape | Braiding / Wires / Tape | Braiding / Wires / Tape | Braiding / Wires / Tape |
| **Jacket/sheath material** | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD | SHF1/SHF2/SHF2-MUD |
| **Outer Jacket diameter (nominal)** | 6.7mm | 10.3mm | 14mm | 14.5mm | 10.5mm | 15.5mm |

Armor options:

B: braided galvanized steel wire
R: corrugated steel tape
W: served steel wire
P: Bronze wire braid
C: Copper wire braid
T: Tinned copper wire braid

Outer sheath: SHF1, SHF2 or SHF2 MUD, single or double layer

## Application/Limitation

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.

Temperature window:
Operation : -40°C to +85 °C
Installation: -15°C to +50°C

## Type Approval documentation

### Tests carried out

| Standard | Release | General description | Limitation |
|---|---|---|---|
| IEC 60096-0-1 | 2012 | Radio frequency cables part 0-1: Guide to design of detail specifications – Coaxial cables | |
| 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 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<br>Category A |
| IEC 60332-3-24 | 2009-02 | Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C | Bunch test<br>Category C |
| 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: |
| 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:<br>pH > 4,3<br>Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2005-04 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements | Low smoke |
| NEK 606 Ed. 4 | 2009-05 | Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification. | Mud resistance test:<br>IRM903 100°C 7d.<br>Calcium Bromide 70°C 56d or<br>Carbo Sea 70°C 56d. |

## Marking of product

TELDOR MG RG type, Impedance, Type P/N, Armor, Jacket type, meter mark – IEC 60332-22 OR IEC 60332-2-24 – LOT No.

| Family | **TYPE** | **Armor** | **Flame Rating** | **Options** |
|---|---|---|---|---|
| MG | RG58<br>RG59<br>RG213<br>RG214<br>RG11<br>RG6 | B =Galvanized Braided Steel Wire<br>R=Corrugated Steel Tape<br>W =Galvanized Served Steel Wire<br>P =Bronze wire braid<br>C =Copper wire braid<br>T =Tin Copper wire braid | A=IEC60332-3-22 (Cat.A)<br>C=IEC60332-3-24 (Cat.C) | XX<br>Alpha numeric |

## Periodical assessment

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

The main elements of the 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
- 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