



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **E-13122**

This is to certify that the  
**Data transmission cables and systems**

with type designation(s)  
**MGD-1 cat 6, MGD-1 cat 6A, MGD-1 cat 7, MGD-1 cat 7A, MGD-1 1200 MHz**

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

is found to comply with  
**Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**

**Type Approval Programme No. 6-827.50-2**  
**IEC 61156-5 Ed. 2.0 (2009-02)**  
**IEC 60332-3-22 (2009-02)**  
**IEC 60332-3-24 (2009-02)**  
**IEC 60754-1 (2011-11)**  
**IEC 60754-2 (2011-11)**  
**IEC61034-1/2 (2005-04/2005-04)**

Application  
**Cable suitable for horizontal floor wiring**  
**Flame retardant in bunch; cat A or Cat C. Halogen free. Low smoke**

Type	Voltage (kV)	Temp. class (°C)
MGD-1 cat 6		
MGD-1 cat 6A		
MGD-1 cat 7		
MGD-1 cat 7A		
MGD-1 1200 MHz		

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-03-28**

for **Det Norske Veritas AS**

DNV local station: **Piraeus**

Approval Engineer: **Ivar Bull**

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**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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

Cables suitable for horizontal floor wiring

Cable types	Design standard	Cross section	Conductor type ref IEC 60228	Shielding
<b>MGD-1 cat 6</b>	IEC 61156-5	23 AWG(0,246mm <sup>2</sup> ), 22 AWG(0,324 mm <sup>2</sup> )	Solid conductor Class 1	U/UTP (not screened) U/FTP F/FTP S/FTP
<b>MGD-1 cat 6A</b>	IEC 61156-5	23 AWG(0,246mm <sup>2</sup> ), 22 AWG(0,324 mm <sup>2</sup> )	Solid conductor Class 1	U/FTP F/FTP S/FTP
<b>MGD-1 cat 7</b>	IEC 61156-5	23 AWG (0,246 mm <sup>2</sup> ), 22 AWG(0,324 mm <sup>2</sup> )	Solid conductor Class 1	S/FTP
<b>MGD-1 cat 7A</b>	IEC 61156-5	23 AWG (0,246 mm <sup>2</sup> ), 22 AWG(0,324 mm <sup>2</sup> )	Solid conductor Class 1	S/FTP
<b>MGD-1 1200 MHz</b>	IEC 61156-7	23 AWG (0,246 mm <sup>2</sup> ), 22 AWG(0,324 mm <sup>2</sup> )	Solid conductor Class 1	S/FTP

## Construction

Conductor	Bare annealed copper or tinned copper class 1
Insulation	Solid or cellular Polyolefine
Individual screen	*/FTP cables have individual foil screen
Common screen	S/*TP cables have a common braid screen F/*TP cables have a common foil screen
Outer sheath	SF/*TP cables have a common foil screen and a braid screen SHF1

Electrical data at 20°C

Category 6		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.0	75.3
4	3.8	66.3
10	6.0	60.3
16	7.6	57.2
31.25	10.7	52.9
62.5	15.4	48.4
100	19.8	45.3
150	24.7	42.7
200	29.0	40.8
250	32.8	39.3

Category 6A		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.0	75.3
4	3.8	66.3
10	5.9	60.3
16	7.5	57.2
31.25	10.5	52.9
62.5	15.0	48.4
100	19.1	45.3
150	23.7	42.7
200	27.6	40.8
250	31.1	39.3
300	34.3	38.1
400	40.1	36.3
500	45.3	34.8

Category 7		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.0	78.0
4	3.7	78.0
10	5.9	78.0
16	7.4	78.0
31.25	10.4	78.9
62.5	14.9	75.5
100	19.0	72.4
150	23.6	69.8
200	27.5	67.9
250	31.0	66.4
300	34.2	65.2
400	40.0	63.4
500	45.3	61.9
600	50.1	60.7

Category 7A		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.1	78.0
4	3.7	78.0
10	5.8	78.0
16	7.3	78.0
31.25	10.3	78.0
62.5	14.6	78.0
100	18.5	78.0
150	22.8	76.0
200	26.5	74.0
250	29.7	72.5
300	32.7	71.2
400	38.0	69.4
500	42.8	67.9
600	47.1	66.7
1000	61.9	63.4

1200 MHz		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	1.9	78.0
4	3.5	78.0
10	5.4	78.0
16	6.8	78.0
31.25	9.6	78.0
62.5	13.7	78.0
100	17.5	76.0
200	25.3	71.5
250	28.5	70.0
300	31.5	68.8
400	36.9	67.0
500	41.8	65.5
600	46.3	64.3
1000	62.0	61.0
1200	69.0	59.8

## Application/Limitation

Temperature window

Operation : -40°C to +85 °C

Installation: -15°C to +50°C

In order to achieve a transmission compliant with Category 7 and above, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bundles of Cables or Wires) are fulfilled without any additional measures.

## Type Approval documentation

**Datasheets** Data transmission cable and system type DB balanced pair non-armored copper cables, - solid conductors rev 09/12 date 2012-06-06

**Type test** DB1B04R2401 – 9DNV001108 cat 6 stranded  
DB2C04S2601 – 9DNV004108 cat 6<sub>A</sub> stranded  
DB5D04s2601 – 9dnv002108 cat7 stranded  
DB5F04S2601 – 9DNV005108 cat 7<sub>A</sub> stranded  
DB5G04B2201- 9DNV003108 1200MHz solid  
DC-W5D04B2303 cat 7 solid dated 2012-04-12  
DB-1B04B2303 cat 6 solid, dated 2012-02-05  
DB-3C04B2303 cat 6<sub>A</sub> solid dated 2012-02-05  
DB5F04B2203 cat 7A dated 2011-12-18  
Flame test report dated 23.01.2014  
Report 9MGD242XXX Category 6 SOLID 23AWG UUTP SHF1 IEC60332-3-22. Dated 6/2-2014  
BREGLOBAL Report No 287633-1 dated 28 August 2013

## Tests carried out

Standard	Release	General description	Limitation
IEC 61156-5	2009-05	Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Horizontal floor wiring – Sectional specification	Reference to requirement for category cable: 6 (250MHz), 6A (500 MHz), 7 (600MHz), 7A (1000 MHz)
IEC 61156-7	2003-05	Multicore and symmetrical pair/quad cables for digital communications - Part 7: Symmetrical pair cables with transmission characteristics up to 1 200 MHz - Sectional specification for digital and analog communication cables	
IEC 60092-359	1999-08	Sheathing materials for shipboard power 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 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
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	1999-07	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/mm
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke

## Marking of product

TELDOR MGD-1- [...] No. of Pairs, Cross-Section, Type, P/N, METER MARK – IEC 60332-3-22 or IEC 60332-3-24 – Lot No.

	Type	Transmission properties	Pair count	Solid Cond.	Awg	Color
MGD-1	1: U/UTP 2: F/UTP 3: SF/UTP 4: U/FTP 5: F/FTP 6: S/FTP 7: SF/FTP	A: Multipair B: cat 6 C: Cat 6A D: cat 7 F: cat 7A G: 1200 MHz	NN	BC: bare copper TC: tinned copper	23=23AWG 22=22AWG	XX alphabetic numeric

## Periodic 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 Routine Tests (RT) checked
- (if RT- and PST-test reports are 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

- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

Survey shall be performed at least every second year.

END OF CERTIFICATE