



# TYPE APPROVAL CERTIFICATE

Certificate no.:  
**TAE00000GF**  
Revision No:  
**4**

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## This is to certify:

that the **Data transmission cables and systems**

with type designation(s)

**MGD Cat 3, MGD Cat 5, Cat 5e, MGD Cat 6, Cat 6A, MGD Cat 7, Cat 7A, MGD 1200MHz, MGD Cat 8**

issued to

**TELDOR Cables & Systems Ltd.**

**Israel, Israel**

is found to comply with

**DNV rules for classification – Ships, offshore units, and high speed and light craft**

## Application:

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**Cable suitable for horizontal floor wiring. Armoured (Optional).**

**Products approved by this certificate are accepted for installation on all vessels classed by DNV.**

Issued at **Høvik** on **2024-11-14**

for **DNV**

This Certificate is valid until **2029-09-30**.

DNV local unit: **Haifa**

Approval Engineer: **Ivar Bull**

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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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

### Product description

MGD solid conductor cables.

Cables suitable for Horizontal Floor wiring between work area communication outlet and communication closet.

Cable types	Design standards	Cross section	Conductor type ref IEC 60228	Shielding
MGD cat 3, 5	IEC 61156-2	24 AWG (0.204mm <sup>2</sup> )	Solid or stranded	F/UTP, U/FTP, F/FTP, S/FTP, SF/UTP, SF/FTP
MGD cat 5e	IEC 61156-5	24 AWG (0.204 mm <sup>2</sup> ) 23 AWG (0.246 mm <sup>2</sup> ) 22 AWG (0.324 mm <sup>2</sup> )	Solid or stranded	F/UTP, U/FTP, F/FTP, S/FTP, SF/UTP, SF/FTP
MGD cat 6	IEC 61156-5	23 AWG (0.246mm <sup>2</sup> ) 22 AWG (0.324 mm <sup>2</sup> )	Solid or stranded	F/UTP, U/FTP, F/FTP, S/FTP, SF/UTP, SF/FTP
MGD cat 6A, 7, 7A	IEC 61156-5	23 AWG (0.246 mm <sup>2</sup> ) 22 AWG (0.324 mm <sup>2</sup> )	Solid or stranded	U/FTP, F/FTP, S/FTP, SF/FTP
MGD 1200MHz	IEC 61156-7	23 AWG (0.246 mm <sup>2</sup> ) 22 AWG (0.324 mm <sup>2</sup> )	Solid	F/FTP, S/FTP, SF/FTP
MGD cat 8(8.1,8.2)	IEC 61156-9	23 AWG (0.246 mm <sup>2</sup> ) 22 AWG (0.324 mm <sup>2</sup> )	Solid	F/FTP, S/FTP, SF/FTP

The cables also meet and comply with TIA 568.2-D standard

### Construction

Conductor	Bare annealed copper or tinned annealed copper class 1
Insulation	Solid /cellular Polyolefin
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 SF/*TP cables have a common foil screen and a braid screen
Inner sheath (Optional)	SHF1 or SHF2
Metallic covering (Optional)	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 or SHF2 or SHF2 MUD, single or double layer.

### Optional Constructions:

Cat3 to Cat 5e cables:

Single cables: 4-25 Pair cables

Multi cables: 2-12 cores or jacketed cables cabled together

Cat 6 to Cat 8 Cables:

Single cables: 4 Pair cables

Multi cables: 2-12 cores or jacketed cables cabled together

Electrical data at 20°C

Category 3		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.6	41
4	5.6	32
10	9.8	26
16	13.1	23

Category 5		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.1	62
4	4.3	53
10	6.6	47
16	8.2	44
20	9.2	42
31.25	11.8	40
62.50	17.1	35
100	22.0	32

Category 5e		
Frequency MHz	Attenuation dB/100m	NEXT dB
1	2.1	65
4	4.1	56
10	6.5	50
16	8.3	47
20	9.3	46
31.25	11.7	43
62.50	17.0	38
100	22.0	35

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

Cat 8		
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	75.4
200	26.5	70.9
250	29.7	69.4
300	32.7	68.2
400	38.0	66.4
500	42.8	64.9
600	47.1	63.7
1000	61.9	60.4
2000	90.5	55.9

Optional: Cold bend per CSA 22.2 @ -40°C and Cold Impact per CSA 22.2 @ -35°C.

### Application/Limitation

Temperature window

Operation : -40°C to +85 °C

Installation: -15°C to +50°C

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 Bunches of Cables or Wires) are fulfilled without any additional measures.

### Type Approval documentation

**Datasheets** Data transmission cable and system type DC balanced pair armored copper cables, rev 14/12 date 2012-06-08

**Type test** DB1B04R2401 – 9DNV001108 cat 6 stranded  
 DB2C04S2601 – 9DNV004108 cat 6A stranded  
 DB5D04s2601 – 9dnv002108 cat7 stranded  
 DB5F04S2601 – 9DNV005108 cat 7A 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 6A solid dated 2012-02-05  
 DB5F04B2203 cat 7A dated 2011-12-18  
 Flame test report Category A dated 23.01.2014  
 9MG0246 Cat 6A Solid armoured Cold bend & Cold Impact dated 18.10.2016  
 9MGC186 Cat 6 Stranded Cold bend & Cold Impact dated 15.10.2015  
 9MGC186 Cat 6 Stranded Cold bend & Cold Impact dated 09.03.2016  
 Teldor Mud and hydraulic oil resistance test NEK 606-2022 dated 24.08.2024.  
 Intertek report 103822513CRT-019b ISO/IEC 11801 - 1 for Category 8.2 dated 23-02-2023  
 Intertek report 103822513CRT-019a ANSI/TIA - 568.2 - D for Category 8.2 dated 23-02-2023

### Tests carried out

Standard	Release	General description	Limitation
DNV CP-0403	2021-09	Data communication cables - category cables	
IEC 61156-1	2023-03	Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification	
IEC 61156-2	2010-04	Multicore and symmetrical pair/quad cables for digital communications – Part 2: Symmetrical pair/quad cables with transmission characteristics up to 100 MHz - Horizontal floor wiring - Sectional specification	
IEC 61156-3	2008-11	Multicore and symmetrical pair/quad cables for digital communications – Part 3: Work area cable - Sectional specification	

Standard	Release	General description	Limitation
IEC 61156-5	2020-04	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	
IEC 61156-6	2020-04	Multicore and symmetrical pair/quad cables for digital communications - Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz - Work area wiring - Sectional specification	Reference to requirement for category cable: 6 (250MHz), 6A (500 MHz), 7 (600MHz), 7A (1000 MHz)
IEC 61156-7	2023-02	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 analogue communication cables	
IEC 61156-8	2023-02	Multicore and symmetrical pair/quad cables for digital communications – Part 8: Symmetrical pair/quad cables with transmission characteristics up to 1 200 MHz – Work area wiring – Sectional specification	
IEC 61156-9	2016-04	Multicore and symmetrical pair/quad cables for digital communications – Part 9: Symmetrical pair/quad cables with transmission characteristics up to 2000 MHz – Horizontal floor wiring – Sectional specification	
IEC 61156-10	2016-04	Multicore and symmetrical pair/quad cables for digital communications – Part 10: Cables for cords with transmission characteristics up to 2 GHz–Sectional specification	
ANSI/TIA 568.2-D	2018-09	Balanced Twisted-Pair Telecommunication Cabling and Components	
ISO/IEC 11801-1	2017-11	Generic cabling for customer premises Part 1: General requirements	Cat 8.2 cable
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2021-01	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	2018-07	Tests on electric cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically mounted bunched wires or cables - Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.

Standard	Release	General description	Limitation
IEC 60332-3-24	2018-07	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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60754-1	2019-11	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	2019-11	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	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
IEC 60332-1-1/2/3	2015-07	Tests on electric and optical fibre cables under fire conditions Test for vertical flame propagation for a single small, insulated wire or cable	
NEK 606 Ed. 5	2022-03	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: Required Max variations ±: IRM902 & 903 100°C 7d. TS & E@B, weight & vol.: ±30% Calc. Bromide 70°C 56d. TS & E@B: ±25%, weight: ±15%, vol.: ±20% Oil based mud: , EDC 95/11 (Carbo Sea) 70°C 56d TS & E@B ±30%, weight & vol.: ±25% Hydraulic/Gear 100°C 7d. TS & E@B, weight & vol.: ±30%
IEC 60092-350	2020-01	Annex E: Cold bend test and impact test for low temperature behavior	Cold bend: -40°C Cold impact: -35°C
CSA C22.2 No. 03	2009	Flexibility at any specified temp.	Cold bend: -40°C
CSA C22.2 No. 03	2009	Abnormal low temperature – impact	Cold impact: -35°C

### Marking of product

TELDOR MGD No. of cores x No. of pairs, Cross-section, Armor (Optional), Type P/N, meter mark – IEC 60332-3-22 OR IEC 60332-3-24 – LOT No.

### **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 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