

# TYPE APPROVAL CERTIFICATE

Certificate no.:  
**TAE0000182**  
Revision No:  
**3**

## This is to certify:

that the **Fiber optical cable**

with type designation(s)  
**MG Fiber Optic cable. Armoured (optional)**

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:

**Fiber Optic cable. Armoured (optional).**  
**Products approved by this certificate are accepted for installation on all vessels classed by DNV.**

Issued at **Høvik** on **2026-02-25**

This Certificate is valid until **2027-02-24**.

DNV local unit: **Haifa**

Approval Engineer: **Ivar Bull**



for **DNV**

This document has been digitally signed and will  
therefore not have handwritten signature

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

MG Fiber Optic cable, flame retardant, low smoke, halogen free

Multi loose tube or single loose tube or multi tight buffered and combination.

Construction	Tight buffered dry core or loose tubes [max 36 fibers per tube]
Central strength member	Dielectric or steel
Peripheral strength member	Aramid or glass yarn
Inner sheath	SHF1 or SHF2 or SHF2 MUD
Metallic covering (optional)	Braided galvanized steel wire
	Corrugated steel tape
	Served (Galvanized) steel wire
	Bronze wire braid
	Copper wire braid
Outer sheath (optional)	Tinned copper wire braid
	SHF1 or SHF2 or SHF MUD, single or double layer

### Approved fiber types:

Fiber code	Units	3	4	5	6	7	8	9	10
Standard designation		Multimode				Singlemode			
ISO/IEC 11801		OM4	OM3	OM2	OM1	-	-	OS2	-
ANSI TIA/EIA		AAAD	AAAC	AAAB	AAAA	-	-	-	-
IEC 60793-2-10		A1a.3	A1a.2	A1a.1	A1b	-	-	-	-
ITU-T		-	-	-	-	G657.A2	G655	G652.D	G657.A1
IEC 60793-2-50		-	-	-	-	B6_a2	B4	B1.3	B6_a1
Operating wavelength	nm	850 1300				1310 1550 1625	1550 1625	1310 1550 1625	
Core diameter	µm	50±2,5	50±2,5	50±2,5	62,5±3				
MFD @1310 nm	µm	-	-	-	-	8,6±0,4	-	9,2±0,4	8,6±0,4
MFD @1550 nm	µm	-	-	-	-	9,6±0,6	9,6±0,6	10,4±0,6	9,8±0,5
Cladding	µm	125±1			125±2	125±0,7			
Coating	µm	245±10				245±5			
Max attenuation Tight buffer	dB/km	3,5 @ 850 nm 1,2@1300 nm			3,5 @ 850 nm 1,5@1300 nm	0,4 @ 1310 nm 0,3 @ 1550 nm	-	0,4 @ 1310 nm 0,3 @ 1550 nm	
Max attenuation Loose tube	dB/km	2,8 @ 850 nm 0,9 @1300 nm			3,2 @ 850 nm 1,0@1300 nm	0,37 @ 1310 nm 0,22 @ 1550 nm 0,25 @ 1625 nm	0,22 @ 1550 nm 0,26 @ 1625 nm	0,37 @ 1310 nm 0,22 @ 1550 nm 0,25 @ 1625 nm	

For more details, please see datasheet.

### 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 :  
 Min. Installation temperature : -30°C  
 Operation temperature: -55°C to + 85°C  
 Storage temperature: -55°C to + 85°C

### Type Approval documentation

Datasheet See approval letter

Type tests Test Report NEK 606 dated 15/07/2019  
 F60040477S dated 26/06/2016  
 F20020206B dated 27/03/2017  
 TT\_F909608V7B\_2017\_04\_04 V02 dated 04/04/2017  
 0093\_19\_1 dated 31/01/2019  
 0094\_19\_1 dated 31/01/2019  
 0095\_19\_1 dated 31/01/2019  
 0096\_19\_1 dated 31/01/2019  
 0968\_19\_1 dated 09/10/2019  
 0969\_19\_1 dated 09/10/2019  
 1351\_18-1 dated 11/108/2018  
 CEL-0710\_19-1 dated 05/08/2019  
 Bre global test report ; DA-6MT002EDK1W01 report no 277021-1  
 Bre global test report ; DA-MLD144DDJ1R01 report no 277021-5  
 DA6MT002EDK1W01; dated 2012-01-02  
 DA-MLD144DDJ1R01 ; dated 2012-01-02  
 Test report dated 2016-06-21  
 BRE test report No. P100530-1 Issue:1 dated 1 July 2015

### Tests carried out

Standard	Release	General description	Limitation
DNVV-CP-0402	2021-09	DNV Class programme Optical fibre cables	
IEC 60793-2-10	2019-05	Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres	
IEC 60793-2-50	2018-12	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	
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 60332-1-2	2025-06	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	Flame retardant small scale. Distance between the lower edge of the top support and the onset of charring > 50 mm and charring not to extend downwards > 540 mm from the lower edge of the top support.
IEC 60332-3-22	2018-07	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	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 - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%
NEK TS606 Ed7	2025-03	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). 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 70°C 56d TS & E@B ±30%, Weight & vol.: ±25%
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 P/N, Fiber type, No. of tubes/tights, No. of fibers in tube, Armor type (if any), jacket type(s), Water blocking type, Certification No., meter marking, Batch/Lot, IEC 60332-3-22/24.

### 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