



Certificate No:
TAE00004JH

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fiber optical cable

with type designation(s)
QFCI, QFCB

Issued to
Belcom Cables Ltd.
Elsenham, Essex, United Kingdom

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

Application :

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

Issued at **Høvik** on **2022-08-15**

This Certificate is valid until **2026-02-15**.

DNV local station: **UK & Ireland CMC & VMC**

Approval Engineer: **Ivar Bull**

for **DNV**

Marta Alonso Pontes
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.

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 300,000 USD.



Manufactured by :
 DNV Id: 144689

Product description

Construction:	PTB loose-tubes (up to 12 fibres per tube)
Loose Tube	Gel Filled
Fire resistant layer	Mica tape
Central strength element	Glass fibre reinforced plastic rod (FRP)
Peripheral strength element	Reinforced fibreglass yams WB (Water Blocking)
Inner Sheath	SHF1
Armour	Galvanized steel wire braiding
Outer Sheath	SHF1, LSZH-MUD (QFCB cables)

Type	Definition IEC	Definition ISO 11801	Definition ITU-T	TIA/EIA
E9/125	60793-2-50 B1.3	OS2	G.652D	
E9/125	60793-2-50 B1.2	----	G.654	
E9/125	60793-2-50 B4/B5	----	G.655/G.656	
E9/125	60793-2-50 B6.A&B	----	G.657A1/A2/B2/B3	
G50/125	60793-2-10 A1a.1	OM2	G.651.1	
G50/125	60793-2-10 A1a.2	OM3	G.651.1	492AAAC
G50/125	60793-2-10 A1a.3	OM4	G.651.1	492AAD
G50/125	60793-2-10 A1a.4	OM5	G.651.1	492AAAE
G62.5/125	60793-2-10 A1b	OM1	----	492AAAA

Application/Limitation

Temperature window

Operation: -40°C to +70°C
 Installation: -10°C to +70°C
 Storage: -40°C to +70°C

This type of cable is fire resistant in accordance with IEC Publication 60331-25. 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.

For Safe Return to Port of passenger vessels: when DNV Rules Part 6.2.11 items 3.3.4.2 and 5.3.2.1 require fire resistant cables, these have to be tested according to IEC 60331-1/2.

Type Approval documentation

Tests carried out

Standard/ req. reference	Year of release	Description	Limitation
DNV-GL CP-0402	2019-07	Type approval of fibre optical cables	
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 60331-25	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 25: Procedures and requirements – Optical fibre cables	Minimum 90 min. During the course of the test, the maximum increase in attenuation shall not exceed the value stated in the relevant specification (1,5 dB per fibre).
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.
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 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
NEK TS 606	2009-05	Cables for offshore installations (cable type F1 QFCI)	
EN 50200:2016	2016-01	Method of test for resistance to fire of unprotected small cables for use in emergency circuits	QFCB cables

Marking of product

Armada® *No of Cores* *Fibre Type* QFCI or QFCB IEC60331-25 / IEC60332-3-22 / IEC60332-3-24 SHF1 or NEK606 MUD RESISTANT DNV CERTIFIED F20 YoM + *Manufacturer Batch* + *Belcom Batch* + Metre Mark

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) checked (if not available tests according to 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 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