TYPE APPROVAL CERTIFICATE

Certificate No:
TAE000016E
Revision No:
4

This is to certify:

That the Data transmission cables and systems

with type designation(s)
QFCI F1/F101

Issued to
Prysmian Group Norge AS
DRAMMEN, **Norway**

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

Application :

Fire resistant fibre optic cable.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2022-01-27**
This Certificate is valid until **2026-06-30**.
DNV local station: **Oslo Maritime and CAP**

Approval Engineer: **Ivar Bull**

for **DNV**

Trond Sjåvåg
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.

Product description

Optical fibre cables designed according to NEK TS 606 Ed5: 2016
Type QFCI-I/O/RM-JM/-F1 or F101 *
Outer sheath: SHF1. Option: Additional SHF1 MUD sheath.

Number of tubes	1 to 6
Number of optical fibers in each tube	0 to 12

Optical fibres

Fibre type	**9/125**	**50/125-OM2**	**50/125-OM3**	**50/125-OM4**	**62.5/125-OM1**
Fiber data sheet	C03/C17**	C34	C31	C32	C02
IEC60793-2-10, 20, 50 cat.	B-G652.D/ B-657.A1	A1-OM2	A1-OM3	A1-OM4	A1-OM1
IEC11801 classification	OS2 and OS1a	OM2	OM3	OM4	OM1
ANSI/TIA/EIA-492 classification	CAAB	AAAB	AAAC	AAAD	AAAA
ITU-T type	G.652.D/ G.657.A1	G.651.1	G.651.1	G.651.1	-
Core diameter	See mode field diameter	50 ± 2 µm	50 ± 2 µm	50 ± 2 µm	62.5 ± 2.5 µm
Mode field diameter	1310 nm 9.0 ± 0.4 µm 1550 nm 10.1 ± 0.5 µm				
Cladding diameter	125 ± 0.7 µm	125 ± 1.0 µm	125 ± 1.0 µm	125 ± 1.0 µm	125 ± 1.0 µm
Primary coating diameter (nominal)	245 ± 10 µm	250 ± 15 µm	250 ± 15 µm	242 ± 5 µm	242 ± 7 µm
Attenuation (Maximum values) 850 nm 1300 nm 1310 nm 1550 nm	 ≤ 0.39 dB/km ≤ 0.25 dB/km	 ≤ 3.5 dB/km ≤ 1.0 dB/km	 ≤ 3.0 dB/km ≤ 1.0 dB/km	 ≤ 3.0 dB/km ≤ 1.0 dB/km	 ≤ 3.5 dB/km ≤ 1.5 dB/km
Bandwidth(OFL) 850 nm 1300 nm		 >500 MHz·km >500 MHz·km	 >1500 MHz·km >500 MHz·km	 >3500 MHz·km >500 MHz·km	 >200 MHz·km >600 MHz·km
Chromatic Dispersion 1285-1330 nm 1550 nm 1625 nm	 ≤ 3 ps/nm·km ≤ 18 ps/nm·km ≤ 22 ps/nm·km				
Polarization Mode Disp. Max. Individual Fibre PMD_Q Link Design Value	 ≤ 0.5 ps/√km ≤ 0.2 ps/√km				
Group index of refraction 850 nm 1300/1310 nm(MMF/SMF) 1550 nm 1625 nm	 1.467 1.467 1.468	 1.482 1.477	 1.482 1.477	 1.482 1.477	 1.496 1.491

** C17 fibres is used for 9/125 since beginning of 2020. These fibres are both G.652.D and G.657.a1 compatible

* F1 is designed according to NEK TS 606 Ed4: 2009

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 60331-25 (1000°C, 3 hours)
This type of cable is fire resistant in accordance with IEC 60331-2 (830°C, 2 hours) including water spray according to EN 50200, Annex E, Water jet according to BS 8491.

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

Tests carried out

Tested according to IEC 60794-1/-2, IEC 60331-25 (3 hours@1000C), IEC 60332-3-22, IEC 60332-3-24, IEC 60754-1/2, IEC 61034-1/2. Fire impact and water resistance test. IEC 60331-2, with additional water spray according to EN 50200Annex E, additional water Jet according to BS 8491.

Marking of product

Eg. "meter" DRAKA 01 "part no" QFCI – MUD (optional) - LSHF-FR - OPTICAL CABLE- "fibre type" – IEC 60331- 2- IEC 60331-25 - IEC 60332-3-22 BATCH NO. "Batch no.".

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