



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-10287

Holder of Certificate  
**NEK Kabel AS**  
LØRENSKOG, Norway

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

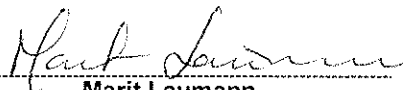
with type designation(s)  
**QFCI**

is found to comply with  
IEC 60794-1-1 (2001)  
IEC 60331-25 (1999-04)  
IEC 60332-3-24 (2000-10)  
IEC 60754-1 (1994-01)  
IEC 61034-1 (2005-04)  
IEC 61034-2 (2005-04)

Application  
**Fiber cable,  
Fire resistant,  
Flame retardant in bunch; cat. C,  
Low smoke,  
Low Halogen**


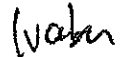
Høvik, 2010-06-28  
for Det Norske Veritas AS

This Certificate is valid until  
2014-06-30

  
Marit Laumann  
Head of Section



DNV local office:  
Milan

  
Kjersti Bakke  
Surveyor 

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.



Certificate No.: E-10287  
 File No.: 827.50  
 Job Id.: 262.1-007872-1

## Product description

Cable type: QFCI

Construction

Fiber type	See tables below
Fire resistance layer type	Mica tape
Central strength element	Loose tube
Inner sheath	Steel wire (plastic coated)
Metal covering	SHF1
Outer sheath	Steel wire braid
	SHF1

MULTIMODE FIBRES			Multimode MM62,5 62.5/125/250	Multimode MM50 50/125/250	Multimode OM3 50/125/250
ITU-T type			-	G.651	-
Core Diameter		µm	62.5 ± 2.5	50 ± 2.5	50 ± 2.5
Cladding Diameter		µm	125 ± 2	125 ± 2	125.0 ± 1.0
Coating Diameter		µm	245 ± 10	242 ± 10	242 ± 7.0
Numerical Aperture			0.275 ± 0.015	0.275 ± 0.015	0.200 ± 0.015
Attenuation	at 850 nm	dB/km (max)	≤ 3.5	≤ 2.8	≤ 2.8
	at 1300 nm	dB/km (max)	≤ 1.0	≤ 0.8	≤ 1.0
Bandwidth	at 850 nm	MHz x km	≥ 200	≥ 500	≥ 1500
	at 1300 nm	MHz x km	≥ 500	≥ 500	≥ 500

SINGLE MODE FIBRES			Single Mode SMR 9,6/125/250	Single Mode SMR LWP 9,6/125/250	Non-Zero Dispersion
ITU-T type			G652.B	G652.D	G655
Mode Field Diameter (MFD)	at 1310 nm	µm	9.2 ± 0.4	9.2 ± 0.4	-
	at 1550 nm	µm	-	-	9.2 ± 0.5
Cladding Diameter		µm	125 ± 1	125 ± 0.7	125 ± 1
Coating Diameter		µm	245 ± 10	245 ± 5	245 ± 10
Attenuation	at 1310 nm	dB/km (max)	≤ 0,38	≤ 0,35	-
	at 1383 nm		-	≤ 0,33	
	at 1550 nm	dB/km (max)	≤ 0,25	≤ 0,25	≤ 0,25
	at 1625 nm	dB/km (max)	-	≤ 0,28	≤ 0,28
Zero dispersion wavelength		λ <sub>0</sub>	1302-1322	1302-1322	-
Chromatic Dispersion	at 1285 + 1330 nm	ps/nm x km	≤ 3,5	≤ 3,5	-
	at 1550 nm	ps/nm x km	≤ 18,0	≤ 18,0	-
	at 1530 + 1565 nm	ps/nm x km	-	-	5,5 to 10,0
	at 1565 + 1625 nm	ps/nm x km	-	-	7,5 to 13,0
PDM	at 1550 nm	Ps/vkm	-	-	≤ 0,20

## Manufactured by

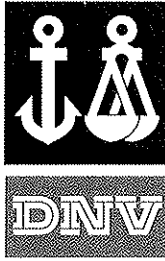
Plasticavi Italiana S. p. a., Almese, Italy

## Responsibility

NEK Kabel AS, Lørenskog, Norway

## Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331-25 and flame retardant according to IEC Publication 60332-3-24.



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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

Datasheet Fo 427 B; Nov 2009.  
Test reports No 033/FO10 12-2009  
No 565/F09  
Csi No DC01/072F08  
Imq no 01SI0069

### Tests carried out

Standard/ req. reference	Year of release	Description
DNV TAP ; 6-827.50-3	2001	Type approval of optical fibre cables
IEC 60092-359	1999	Electrical installations in ships - Part 359: Sheathing materials for shipboard power and telecommunication cables
IEC 60331-25	1999	Tests for fibre optic cables under fire conditions - Circuit integrity - Fire alone at a flame temperature of at least 750 °C
IEC 60332-3-24	2009	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
IEC60754-1	1994	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the amount of halogen acid gas
IEC 60794-1	2003	Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures, selected test E1, E4, E6, E7, E10, E11, E11B,
IEC 61034-1	2005	Measurement of smoke density of cables burning under defined conditions - Part 1: Test apparatus
IEC 61034-2	2006	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements

### Marking of product

NEK Kabel AS – Almese – QFCI – IEC 60331-25 / IEC 60332-3-24



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### **Certificate Retention Survey**

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 Routines (RT) checked (if 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
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE