

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
AICI, AIAI

Issued to
AP Solutions Oy
Rovaniemi, Finland

is found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
Type Approval Programme No. 6-827.50-1

Application :

AICI Fiber optic cable according to NEK606.

This Certificate is valid until **2017-12-31**.

Issued at **Høvik** on **2015-12-16**

DNV GL local station: **Milan**

Approval Engineer: **Ivar Bull**

for **DNV GL**

.....
Marit Laumann
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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **TAE00000UF**
 File No: **827.50**
 Job Id: **262.1-020772-1**

Product description

NEK606 Type F6 AICI (steel wire braid)

AIAI (Strength member of yarn)
 AIOI (Tinned copper wire braid)

Braid may also be made of Bronze Wire.

Optical fibres

TYPE OF FIBRES	Single Mode 9/125	Multimode 50/125	Multimode 50/125	Multimode 62.5/125
IEC 60793-2-50 Cat:	B.1.3	A.1a	A1a.2	A.1b
IEC 11801 Class	OS1 and OS2	OM2	OM3	OM1
ITU-T type	G.652D	G.651	G.651	G.651
Mode Field Diameter (MFD)	at 1310 nm μm	9.2 ± 0.4	-	-
	at 1550 nm μm	10.3 ± 0.5	-	-
Core Diameter	μm	See mode field diameter	50 ± 2.5	62.5 ± 2.5
Cladding Diameter, loose tube	μm	125.0 ± 0,7	125.0 ± 2.0	125.0 ± 2.0
Cladding Diameter, tight buffer	μm	125.0 ± 0,7	125.0 ± 2.0	125.0 ± 2.0
Primary Coating Diameter	μm	242 ± 2.0	250	250
Numerical Aperture		0.14	0.275 ± 0.015	0.275 ± 0.015
Attenuation	at 850 nm dB/km (max)	-	≤ 3.5	≤ 2.8
	at 1300 nm dB/km (max)	-	≤ 1.0	≤ 1.0
	at 1310 nm dB/km (max)	≤ 0.40	-	-
	at 1550 nm dB/km (max)	≤ 0.22	-	-
	at 1625 nm dB/km (max)	-	-	-
Bandwidth	at 850 nm MHz x km	-	160 to > 300	400 to > 1000
	at 1300 nm MHz x km	-	500 to > 1000	400 to > 1500
Chromatic Dispersion	at 1285 ÷ 1330 nm ps/nm x km	≤ 3.0 x km	-	-
	at 1550 nm ps/nm x km	≤ 18 x km	-	-
	at 1530 ÷ 1565 nm ps/nm x km	-	-	-
	at 1565 ÷ 1625 nm ps/nm x km	-	-	-

Crush acc IEC 60794-1-2 E3:	2000 (N/10cm)
Impact acc IEC 60794-1-2 E4:	1 impacts 25J
Torsion acc IEC 60794-1-2 E7:	±1 turns/1m
Minimum bending radius of cable(Static) :	15 x outer diameter
Cable bend acc IEC 60794-1-2 E11:	<0,5dB/±5 turn
Flexibility IEC60794-1-2E8:	1000 cycles
Water tightness acc IEC 60794-1-2 F5B: in water.	<3m/24 hours. Not to be continuously submerged

Certificate No: **TAE00000UF**
 File No: **827.50**
 Job Id: **262.1-020772-1**

TYPE OF FIBRES (continued)			Multimode 62.5/125	Multimode 50/125
IEC 60793-2-50 Cat:				
IEC 11801 Class			OM1+	OM4+
ITU-T type				
Mode Field Diameter (MFD)	at 1310 nm	µm		-
	at 1550 nm	µm		-
Core Diameter		µm	62.5 ± 2.5	50 ± 2.5
Cladding Diameter, loose tube		µm	125 ± 1	125 ± 1
Cladding Diameter, tight buffer		µm	125 ± 1	125 ± 1
Primary Coating Diameter		µm	242±7	242 ± 7.0
Numerical Aperture			0.275 ± 0.015	0.200 ± 0.015
Attenuation	at 850 nm	dB/km (max)	≤ 2.8	≤ 2.4
	at 1300 nm	dB/km (max)	≤ 0,7	≤ 0,6
	at 1310 nm	dB/km (max)	-	-
	at 1550 nm	dB/km (max)	-	-
	at 1625 nm	dB/km (max)	-	-
Bandwidth	at 850 nm	MHz x km	≥250	≥ 3500
	at 1300 nm	MHz x km	≥ 1000	≥ 500

Manufactured by
 TECNIKABEL S.p.A.
 10088 - VOLPIANO (TO)
 ITALY

Application/Limitation

Temperature window
 Operation: -40°C to +70°C
 Installation: -10°C to +70°C

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: AICI SHF1 dated 15.05.2015
 AIAI dated Feb 07 2013

Test reports: AICI: FO 2013-081 dated 27/Jun/2013
 AIAI: FO 2013-080 dated 27/Jun/2013
 2015 Type test report OM1+
 Technicabel 229577 OM4

Tests carried out

Tested according to IEC 60794-1/-2, IEC 60332-3-22, IEC 60332-3-24, IEC 60754-1/2 and IEC 61034-1/2.

Marking of product

AP Solutions - AICI or AIAI - FIBER OPTIC CABLE - No of fibres - Type of fibres - Lot No.

Certificate No: **TAE00000UF**
File No: **827.50**
Job Id: **262.1-020772-1**

Periodical assessment

The scope of the Periodical assessment 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 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 marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE