DNV·GL

Certificate No:
TAE00003F3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
Profibus Marin DP,
Profibus Marine PA,
Industrial bus RS 485

Issued to
NEK Kabel AS
LØRENSKOG, Norway

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

Application :

Fieldbus Data communication cables. Armoured.

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

Issued at **Høvik** on **2019-03-22**
This Certificate is valid until **2024-03-21**.
DNV GL local station: **Oslo Maritime and CAP**

Approval Engineer: **Ivar Bull**

for **DNV GL**

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.

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Job Id: **262.1-028429-1**
Certificate No: **TAE00003F3**

Product description

Armoured fieldbus cables for marine and offshore automation solutions.
Cables for interconnection of process controllers, drives, actuators and sensors.
Fieldbus cables represent physical layer (layer 1) in ISO Open Systems Interconnection Model (OSI model).

Profibus Marin DP,
Profibus Marine PA,
Industrial bus RS 485

IEC 61158-2	Type A	Type B		
Bus Type	Profibus Marin DP	Profibus Marine PA	Industrial bus RS 485	Units
Impedance	150±15@ 3-20MHz	100±20	120±15 @ 1MHz	[Ω]
Capacitance (f=800Hz)	30 @ 800 - 1000 Hz	50@	42@800 Hz	pF/m
DC Resistance	≤55	44	≤55	[Ω/km]
Attenuation	≤22,0 @ 4MHz	≤12 @ 1MHz	≤20,0 @ 1MHz	[dB/km]
Operating Voltage	100	125	100	[V]
Conductor area	0,327	1,00	0,327	mm2
	22	17	22	AWG
Number of pairs	1	1	1,2 or 4	-
Individual shield	Al Mylar tape	-	Al Mylar tape	-
Overall shield	Tinned cu braid	Tinned cu braid	Tinned cu braid	-
Wire Colors	Red, green	Red, green	White, yellow, blue, orange	-
Extra wire(s)	-	2x1,0	-	-
Standard	IEC 61158 IEC 61784	IEC 61158 IEC 61784		-
User organisation	www. Profibus.com	www. Profibus.com		-

Construction:

Conductor	Stranded bare or tinned copper
Insulation material	Foamed PE
Individual Shield	Al Mylar tape
Overall Shield	Tinned Cu braid
Inner sheath material	SHF1
Armour	Galvanised steel wire braid (GSWB)
Outer sheath	SHF1 or SHF2

Manufactured by:

DNV GL Id: 10630537

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.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC 61158-2 ed. 6	2014-07	Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition	Cable specifications as per item 22.1.2.2 and table 113.
IEC 61784-1 Ed.3.0	2010-07	Industrial communication networks - Profiles - Part 1: Fieldbus profiles	
IEC 61784-2 Ed.2.0	2010-07	Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3	
IEC 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	Outer sheath material according to IEC 60092-360
IEC 60332-1	2004-07	Tests on electric and optical fibre cables under fire conditions – Part 1-1:Test for vertical flame propagation for a single insulated wire or cable – Apparatus	Flame retardant small scale
IEC 60332-3-22	2009-02	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	2011-11	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	2011-11	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	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%

Marking of product

NEK Kabel – Profibus Marin DP or Profibus Marine PA or Industrial bus RS 485 - Number & Type of conductors, shield type, - IEC 60332-3-22 - Lot number, METER 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) 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