



Certificate no.:
TAE00004V1

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Category cables

with type designation(s)
RADOX OFL CAT5e 4X(2X24AWG) BK, RADOX OFL CAT7 4X(2X23AWG) BK

issued to
Huber+Suhner AG
Pfäffikon, ZH, Switzerland

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

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2024-08-28**

This Certificate is valid until **2029-08-27**.

for **DNV**

DNV local unit: **Augsburg**

Approval Engineer: **Carsten Hunsalz**

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.



Form code: TA 251

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Product description

Type:	RADOX OFL CAT5e 4X(2X24AWG) BK and RADOX OFL CAT7 4X(2X23AWG) BK
Conductor	Tin plated copper, stranded 7x32AWG (7x0.24mm) CAT5e Bare copper, stranded 7x31AWG (7x0.23mm) CAT7
Insulation	RADOX Foam
Cabling / Individual screen	Twisted pairs with Aluminium tape
Overall screen	Tinned copper wire braid
Outer Sheath	RADOX Elastomer S FH (SHF2 MUD)

RADOX OFL CAT5e 4X(2X24AWG) BK

Number of cores x conductor cross-section	Overall diameter
4 x 2 x 24 AWG	OD:8.1±0.5mm

Frequency (MHz)	Attenuation (dB/100m)	PS NEXT (dB)	PS- EL FEXT (dB)	Return loss (dB)
	Max.	Min.	Min.	Min.
1	2.1	-	-	-
4	4.1	73.3	79	23.0
10	6.5	47.3	71	25.0
31.25	12.0	39.7	61.1	23.5
62.5	17.1	35.4	55.1	21.5
100	22.1	32.3	51	20.1
300	50	62.3	43.0	17.3
600	73.3	57.8	35.4	17.3

RADOX OFL CAT7 4X(2X23AWG) BK

Number of cores x conductor cross-section	Overall diameter
4 x 2 x 23 AWG	OD:9.8±0.5mm

Frequency (MHz)	Attenuation (dB/100m)	PS NEXT (dB)	PS- EL FEXT (dB)	Return loss (dB)
	Max.	Min.	Min.	Min.
1	2.0	-	-	-
4	4.1	75	79	23.0
10	6.5	75	71	25.0
31.25	11.8	75	60.8	23.5
62.5	17.1	72.5	55.1	21.5
100	19	69.4	51.0	20.1
300	34.2	62.2	41.5	17.3
600	50.1	57.7	35.4	17.3

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.

Due to the low cross section of these cables, extra precautions shall be made during installation. In order to achieve a transmission link compliant with Category 5e and 7, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

Horizontal and Work area wiring cables Cat. 5e and 7
Flame retardant Cat. D. Halogen free. Low smoke.

Temperature window:
Operation: -40°C to +80°C
Installation: -20°C to +60°C

Min. bending radius: 8 x cable dia.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
DNV-CP-0403	2021-09	DNV Type approval program for Data communication cables – category cables	Ref. IEC 61156-5 standard Category 5e, 7
IEC 61156-5	2020-04	Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Horizontal wiring – Sectional specification	
IEC 61156-6	2020-04	Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Work area wiring – Sectional specification	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame	
IEC 60332-3-25	2018-07	Tests on electric and optical fibre cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D	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 60684-2	2011-08	Clause 45.2 Methods of determination of low levels of fluorine	Fluorine content < 0,1%
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	2022	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification. Mud	MUD sheath SHF 2: IRM 902 / 903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95-11 base oil 70°C 56d.

Marking of product

HUBER+SUHNER RADOX OFL CAT5e 4X(2X24AWG) SHF2 MUD IEC 60332- 1- 2 85188410- [batch no]
[date of manufacture] [prod- place]

or

HUBER+SUHNER RADOX OFL CAT7 4X(2X23AWG) SHF2 MUD IEC 60332- 1- 2 85188411- [batch no]
[date of manufacture] [prod- place]

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