



Certificate no.:
TAE00004V0

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Category cables

with type designation(s)
RADOX MARINE CAT5e

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 **2024-01-24**

This Certificate is valid until **2029-01-23**.

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

Revision: 2023-09

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Product description

Type: RADOX MARINE CAT5e

Conductors:	Tinned stranded copper
Core insulation:	XLPE
Individual screen:	Tape + plastic laminated aluminium tape
Common screen:	Tinned copper wire braid
Inner covering:	Tape
Outer sheath:	RADOX Elastomer S FH (SHF2, SHF mud)

Number of cores: 4
Cross-section: 0,5 mm²

Electric ratings and measurements

Voltage rating:	300 Vac
Resistance at 20°C:	≤40.1 Ω/km
Impedance characteristic at 100MHz:	100 Ω ± 5 Ω

Frequency MHz	Attenuation dB/100m	PS NEXT dB	EL FEXT dB	Return Loss dB
	max	min	min	min
4	4,1	53,3	52,0	23,0
10	6,5	47,3	44,0	25,0
31,25	11,7	39,9	34,1	23,6
62,5	17,0	35,4	28,1	21,5
100	22,0	32,3	24,0	20,1

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 Bundles of Cables or Wires) are fulfilled without any additional measures.

Data communication cable. Halogen free. Low smoke. Flame retardant in bunch Cat. A.
Storage temperature -50°C to 40°C
Min. installation and handling temperature -40°C

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2020-01	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 61156-1	2009-10	Multicore and symmetrical pair/quad cables for digital communications - Part 1: Generic specification	
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 floor wiring – Sectional specification	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
EN 50289-3-9	2001-08	Communication cables - Specifications for test methods Part 3-9: Mechanical test methods - Bending tests	

Standard	Release	General description	Limitation
EN 50289-3-16	2001-08	Communication cables - Specifications for test methods Part 3-16: Mechanical test methods - Cable tensile performance	
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 60332-3-22	2018-07	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	
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	
IEC 60754-1	2019-11	Test on gases evolved during combustion of materials from cables – Part 1: Determination of the halogen acid gas content	
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	
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test	
IEC 61034-2	2019-11	Measurement of smoke density of cables burning under defined conditions – Test procedure and requirements	
NEK TS 606	2016	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	

Marking of product

HUBER+SUHNER RADOX MARINE CAT5e, 4X0.5mm², SHF2, SHF MUD, 90C, IEC 60332-1-2, IEC 60332-3-22, Item number, Production lot number, week-year, Production facility

Place of Production

HUBER+SUHNER CCM, No. 6 Xinyong road, 213164 Changzhou, China

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