DNV·GL

Certificate No:
TAE00002G1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
RADOX MARINE CAT5e

Issued to
Huber+Suhner AG
Pfäffikon ZH, Switzerland

is found to comply with
DNV GL 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 GL.

Issued at **Hamburg** on **2017-12-04**

This Certificate is valid until **2022-12-03**.
DNV GL local station: **Augsburg**

Approval Engineer: **Holger Jansen**

Digitally Signed By: Rinkel, Marco
for **DNV GL**
Location: Hamburg - On behalf of

Joannis Papanuskas
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.

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 Bunches 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

Test Report: Test result summary Doc no. RM-11, 2017-06-19
VDE No. 235302-CC4-1, 2017-06-08
VDE No. 608700-9021-0001/174239-1en CC4/hz, 2013-09-19
VDE No. 608700-9021-0001/174239-1b-en CC4/hz, 2014-01-16
DELTA No. T724247, 2017-04-28
MPA Dresden No. 20170318/01, 2017-03-29
MPA Dresden No. 20170318/02, 2017-03-29
MPA Dresden No. 20170318/04, 2017-03-29
MPA Dresden No. 20170318/05, 2017-03-29
Documentation: Technical Datasheet 85066809J(e), 2017-11-29
Type Approval Assessment Report 2017-11-17

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 61156-1	2015-06	Multicore and symmetrical pair/quad cables for digital communications - Part 1: Generic specification	
IEC 61156-5	2012-12	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	2014-04	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	
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	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	
IEC 60332-3-25	2009-02	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	2011-11	Test on gases evolved during combustion of materials from cables – Part 1: Determination of the halogen acid gas content	
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	
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test	
IEC 61034-2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test procedure and requirements	

Standard	Release	General description	Limitation
NEK TS 606	2016	Cables for offshore installations. Halogen-free low smoke and flame-retardant / fire resistant (HFFR-LS) 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

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