

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
SeaTex 10, SeaTex 15

Issued to
SSB-Electronic GmbH
Lippstadt Nordrhein-Westfalen, Germany

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.

This Certificate is valid until **2021-11-30**.

Issued at **Hamburg** on **2016-12-01**

DNV GL local station: **Essen**

Approval Engineer: **Carsten Hunsalz**

for **DNV GL**

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Duy Nam Le
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.

Job Id:
Certificate No: **TAE00001JX**

Product description

Halogen free, SHF 2 sheathed radio frequency coaxial cable.

Type: SeaTex 10 and SeaTex 15
 Temperature range: -40 to 85 °C Installation and flexible use
 -55 to 85 °C Transport and fixed installation
 Inner conductor: Stranded copper wire 7x1.0 SeaTex 10
 7x1.5 SeaTex 15
 Insulation: Foamed Polyethylene (PE) with skin
 Braid: Copper foil + bare copper wires 75% coverage
 Sheath: SHF 2

Electrical Characteristics	Capacitance (1 kHz) nF/km	Impedance Ω	Screen attenuation 1GHz dB
SeaTex 10	78	50 +- 2	>90
SeaTex 15	78	50 +- 2	>90

Attenuation dB/100m

Frequency (MHz)	10	100	500	1000	2000	2400	3000	4000	5000	6000	8000
SeaTex 10	1,2	4	9,6	14,2	21,2	23,6	26,7	31,1	35,2	39	46,4
SeaTex 15	0,86	2,81	6,7	9,8	14,6	16,2	18,3	21,6	24,6	27,5	

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.

Radio frequency coaxial cable
 Flame retardant Cat. A. Halogen free. Low smoke.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC 60096-0-1	2012-10	Radio frequency cables – Part 0-1: Guidelines to the design of detail specifications – Coaxial cables	Partly used
IEC 61196-9-1	2014-01	Coaxial communication cables – Part 9: Sectional specification for RF flexibles cables	Partly used

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Standard	Release	General description	Limitation
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.	
EC 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 60684-2	2011-08	Item 45.2 Determination of low levels of fluorine	Fluorine content, maximum 0,1 %
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

www.ssb.de - SeaTex 10 - SHF2 - 50 Ohm - LowLoss - IEC 60332-3-22 - "sequential length in meter"
"WW" "internal lot number" Made in Germany

or

www.ssb.de - SeaTex 15 - SHF2 - 50 Ohm - LowLoss - IEC 60332-3-22 - "sequential length in meter"
"WW" "internal lot number" Made in Germany

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.

Assessment to be performed at least every second year.

END OF CERTIFICATE