DNV·GL

Certificate No:
**TAE00001JX**

# 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**

for **DNV GL**

DNV GL local station: **Essen**

Approval Engineer: **Carsten Hunsalz**

**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.


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## 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<br>-55 to 85 °C Transport and fixed installation |
| Inner conductor: | Stranded copper wire 7x1.0 SeaTex 10<br>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 –<br>Part 0-1: Guidelines to the design of detail specifications – Coaxial cables | Partly used |
| IEC 61196-9-1 | 2014-01 | Coaxial communication cables –<br>Part 9: Sectional specification for RF flexibles cables | Partly used |
| 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. | |

| Standard | Release | General description | Limitation |
|---|---|---|---|
| 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