DNV·GL

Certificate No:
**TAE00003K7**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Category cables**

with type designation(s)
**50007TSF CAT 7 shielded S/FTP suitable for data communication application like CAT5E / CAT6 / CAT6A / CAT7**

Issued to
**Belden Hirschmann Industries (Suzhou) Ltd.**
**Kunshan City, Jiangsu Province, China**

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 **2019-07-16**
This Certificate is valid until **2024-07-15**.
DNV GL local station: **Shanghai**

Approval Engineer: **Carsten Hunsalz**

for **DNV GL**

**Arne Schaarmann**
**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

Category cable CAT 7

| | |
|---|---|
| Conductor | 23 AWG stranded bare copper wire |
| Insulation | PO - Polyolefin |
| Cabling | Twisted pairs with aluminum foil – polyester tape |
| Metallic covering | Tinned copper wire braid |
| Sheath | SHF1 Low Smoke Zero Halogen (LSZH) |

| Number of cores x conductor cross-section | Overall diameter nominal |
|---|---|
| 4 x 2 x 23 AWG | OD:9.0 mm |

| Frequency (MHz) | Max. Attenuation (dB/100m) | Min. NEXT (dB) | Min. PSNEXT (dB) | Min. ELFEXT (dB) | Min. PSELFEXT (dB) | Min. Return Loss (dB) | Min. TCL (dB) | Min. ELTCTL (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | / | / | / | / | / | / | 40.0 | 35.0 |
| 4 | 3.74 | 78.0 | 75.0 | 78.0 | 75.0 | 23.0 | 34.0 | 23.0 |
| 8 | 5.24 | 78.0 | 75.0 | 77.2 | 74.2 | 24.5 | 31.0 | 16.9 |
| 10 | 5.86 | 78.0 | 75.0 | 75.3 | 723 | 25.0 | 30.0 | 15.0 |
| 16 | 7.41 | 78.0 | 75.0 | 71.2 | 68.2 | 25.0 | 28.0 | 10.9 |
| 20 | 8.29 | 78.0 | 75.0 | 69.3 | 66.3 | 25.0 | 27.0 | 9.0 |
| 25 | 9.29 | 78.0 | 75.0 | 67.3 | 64.3 | 24.3 | 26.0 | 7.0 |
| 31.25 | 10.41 | 78.0 | 75.0 | 65.4 | 62.4 | 23.6 | 25.1 | / |
| 62.5 | 14.88 | 75.5 | 72.5 | 59.4 | 56.4 | 21.5 | 22.0 | / |
| 100 | 19.02 | 72.4 | 69.4 | 55.3 | 52.3 | 20.1 | 20.0 | / |
| 200 | 27.47 | 67.9 | 64.9 | 49.3 | 46.3 | 18.0 | 17.0 | / |
| 250 | 30.97 | 66.4 | 63.4 | 47.3 | 44.3 | 17.3 | 16.0 | / |
| 300 | 34.19 | 65.2 | 62.2 | 45.8 | 42.8 | 17.3 | / | / |
| 500 | 45.26 | 61.9 | 58.9 | 41.3 | 38.3 | 17.3 | / | / |
| 600 | 50.10 | 60.7 | 57.7 | 39.7 | 36.7 | 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 7, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

Horizontal cables Cat. 7 (can also be used for work area wiring)
Flame retardant in bunch; cat A + C.
Temperature window for operation: -25°C to +80°C
Temperature window for installation: -15°C to +60°C

## Type Approval documentation

Data sheet : 50007TSF-Rev5

Test reports: CT19-01034, CT17-05079, CT16-6969
BELDEN no.: 190417-01

## Tests carried out

| Standard | Release | General description | Limitation |
|---|---|---|---|
| DNVGL-CP-0403 | 2015-12 | DNV GL Type approval program for Data communication cables – category cables | Ref. IEC 61156-5 standard Category 7. |
| IEC 61156-5 | 2009-05 | 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 | Reference to requirement for category cable: 7 (600MHz), |
| IEC 61156-6 | 2010-01 | 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 | Reference to requirement for category cable: 7 (600MHz), |
| 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 | Bunch test Category A |
| IEC 60332-3-24 | 2018-07 | Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C | Bunch test Category C |
| 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 61034-1/2 | 2013-06 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements | Low smoke Light transmittance >60% |

## Marking of product

BELDEN 50007TSF INDUSTRIAL SHIPBUILDING CAT 7 S/FTP 4PR23 SUN RES LSZH - SHF1 – ZH IEC60332-3-22/24 "internal lot number"

## Place of Production

DNV GL id: 10630537

## 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