

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Category cables**

with type designation(s)

**U-FSPO/IS/TCWB/LSZH/GSWB/LSZH - 125 V - Cat.7 S/FTP,
U-FSPO/IS/TCWB/LSZH/GSWB/LSZH - 125 V - Cat.7A S/FTP**

Issued to

**Cavicel S.p.A.
Pioltello MI, Italy**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Data communication cable, installation/horizontal cable. Armoured.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2020-09-14**for **DNV GL**This Certificate is valid until **2025-09-13**.DNV GL local station: **Italy/Malta CMC**Approval Engineer: **Ivar Bull****Marta Alonso Pontes
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

U-FSPO/IS/TCWB/LSZH/GSWB/LSZH - 125 V - Cat.7 S/FTP, U-FSPO/IS/TCWB/LSZH/GSWB/LSZH - 125 V - Cat.7A S/FTP

Construction :

Conductor	Plain annealed copper AWG 23/1 (0,26 mm ²)
Insulation	Foam-skin polyethylene
Individual screen	Al/PET, aluminium outside
Common screen	Tinned copper wire braid nom. 55% covered
Inner sheath	SHF1
Armour	Galvanized steel wire braid
Outer sheath	SHF1, SHF2 or SHF2 mud

Electrical properties :

Voltage rating	125 V
Max Conductor resistance	73.0 Ω/km
Nom. core/core capacitance	43 nF/km
Nom. impedance Characteristic Z	100 ± 20 Ω at 1 Mhz
Velocity of propagation	>70%

For further transmission properties, please refer to cable data sheets.

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.

Cables with solid conductors shall be terminated with suitable connectors in order to prevent break of conductors due to ship vibrations.

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 and 7a, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

Type Approval documentation

Datasheets:

ST/1906/08 Rev 1 Dated 10/09/2019 CAT. 7 S/FTP LAN cable - Individual and Overall screened

ST/1906/07 Rev 1 Dated 10/09/2019 CAT. 7a S/FTP LAN cable - Individual and Overall screened

Test reports:

Quality control plan S/FTP CAT 7A rev 1 including DNVGL comments dated 28.07.2020.

DNVGL Approved test and inspection program for witnessed testing in period 01.01.2020 to 29.07.2020

File with test reports Nos 37358, 37384, 37376, 37374, 37375, 37362, 37377, 37383 dated 02.03.2020 and Nos 37726, 37724 dated 28.07.2020.

File with test reports Nos 37378, 37359, 37361, 37364, 37365, 6052, 6051, 6050 dated 02.03.2020 to 05.03.2020.

Job Id: **262.1-032781-1**
 Certificate No: **TAE000041K**

Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0403	2019-07	CLASS PROGRAMME, Type approval. Data communication cables – category cables	
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 floor wiring – Sectional specification	Reference to requirement for category cable: 5e (100MHz), 6 6A 7 (600 MHz), 7A (1000MHz), 8 (2000MHz)
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.	SHF1 or SHF2 outer sheath
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	Flame retardant small scale. Distance between the lower edge of the top support and the onset of charring > 50 mm AND Charring not to extend downwards > 540 mm from the lower edge of the top support.
IEC 60332-3-22	2018-07	Tests on electric 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 +AMD1:2019 CSV	2019-11	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 +AMD1:2019 CSV	2019-11	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	2013-07 2013-09	Measurement of smoke density of cables	(Light transmittance >= 60%)

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Standard	Release	General description	Limitation
NEK TS606 Ed5	2016	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: Required Max variations ±: IRM902 & 903 100C 7d. TS & E@B, weight & vol.: ±30% Calc. Bromide 70C 56d. TS & E@B: ±25%, weight: ±15%, vol.: ±20% Oil based mud: EDC 95/11 70C 56d TS & E@B ±30%, weight & vol.: ±25%

Marking of product

CAVICEL ITALY - P/153593 - 4x2x23/1 AWG - 125 V - CAT. 7 S/FTP - SHF1 - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking OR
Customized features : Flame retardant - LSZH
CAVICEL ITALY - P/153595 - 4x2x23/1 AWG - 125 V - CAT. 7 S/FTP - SHF2 MUD - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking OR
CAVICEL ITALY - P/153594 - 4x2x23/1 AWG - 125 V - CAT. 7 S/FTP - SHF2 - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking

CAVICEL ITALY - P/153590 - 4x2x23/1 AWG - 125 V - CAT. 7A S/FTP - SHF1 - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking OR
Customized features : Flame retardant - LSZH
CAVICEL ITALY - P/153592 - 4x2x23/1 AWG - 125 V - CAT. 7A S/FTP - SHF2 MUD - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking OR
CAVICEL ITALY - P/153591 - 4x2x23/1 AWG - 125 V - CAT. 7A S/FTP - SHF2 - IEC 60332-3-22 Cat. A - BATCH *****/** + meter marking

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) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall 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