



# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAE00000U1**  
Revision No:  
**3**

## This is to certify:

**That the Data transmission cables and systems**

with type designation(s)  
**S/FTP CAT. 7 LSZH Cable 4 pair,**  
**S/FTP CAT. 7A LSZH Cable 4 pair**

Issued to  
**Cavice S.p.A.**  
**Pioltello MI, Italy**

is found to comply with  
**DNV rules for classification – Ships, offshore units, and high speed and light craft**

## Application :

**Data communication cable.**  
**Products approved by this certificate are accepted for installation on all vessels classed by DNV.**

Issued at **Høvik** on **2021-08-27**

for **DNV**

This Certificate is valid until **2026-06-30**.

DNV 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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

Type(s):	S/FTP CAT. 7 LSZH Cable 4 pair, S/FTP CAT. 7A LSZH Cable 4 pair
Standards	Cat. 7 and Cat. 7A - Installation cable according to IEC 61156-5
Construction:	
Conductors:	Stranded plain annealed copper wire, 23/7 AWG (7x0.22 mm)
Core insulation:	Foam-skin polyolefine, nom. diameter 1.55 mm
Individual screen:	Aluminium/polyester tape, aluminium outside
Metal covering:	Tinned, Copper wire braid
Outer sheath:	SHF1 or SHF2 or SHF2 MUD

### Electrical characteristics:

Max operating voltage	125 V
Dielectric test (cond.-cond.)	700 V r.m.s. for 1'
(cond.-shield)	700 V r.m.s. for 1'
Conductors resistance (@ 20°C in d.c.)	max 72.0 Ω/km
DC-loop resistance:	≤ 150 Ω/km
Insulation resistance	min. 5.0 G Ω x km
Capacitance	nom. 42 pF/m
Capacitance unbalance	max. 1600 pF/km
Propagation velocity (@ 100 MHz)	75 %
Propagation delay (@ 100 MHz)	nom. 470 nsec/100m (max 520 nsec/100 m)
Delay skew (4÷1000 MHz)	nom. 15 nsec/100m (max 25 nsec/100 m)
Characteristic impedance	100 Ω (± 15%) 1-600MHz , 100 Ω (± 25%) 600-1000 MHz
Transfer impedance @ 1 MHz	10 mΩ/m
@ 10 MHz	10 mΩ/m
@ 30 MHz	30 mΩ/m
@ 100 MHz	100 mΩ/m

### Electrical data at 20°C

Frequency MHz	Attenuation, nom [dB/100m]	PS NEXT [dB]
1	2.0	> 95
4	3.6	> 95
10	5.6	> 95
16	7.2	> 95
20	8.3	95
31,25	10.2	92
62,5	14.6	90
100	19.0	88
125	21.2	87
155,52	24.0	86

Frequency MHz	Attenuation, nom [dB/100m]	PS NEXT [dB]
200	27.5	85
250	30.7	83
350	36.5	81
500	44.6	80
600	49.3	78
700	79,6	74
800	84,5	72
900	87,8	70
1000	92,9	65

## Application/Limitation

Operation: - 20°C to +75°C  
 Installation: - 5°C to +50°C  
 Minimum bending radius after installation: 8 x OD  
 Minimum bending radius during installation: 12 x OD

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.

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

- Data sheet: ST/1209/22 Rev. 4 dated 11/06/2021
- Test report: Test report No 28760/13 dated 04/12/13
- Quality control plan rev. 0 dated 25/09/2013. 28760/13, 28764/13, 28774/13, 28766/13, 28765/13, 28767/13, 28771/13, 28772/13, 28773/13, 4579/13, 4578/13, 4580/13.
- Technical report dated 03-05-2012. Outer sheath. Mud compound.
- IMQ test report CN15S0447511-01 dated 2015/07/14. Test for Oil based drilling fluid EDC 95/11
- IMQ test report CN15S0523325-01/1 dated 2015/10/08. Test for IRM902 and IRM903.
- IMQ test report CN15S0523325-01/2 dated 2015/11/13. Test for CALCIUM BROMIDE BRINE.
- Cavical test report No 28764/13 witnessed by DNV GL 2013-12-06.

### Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0403	2019-07	DNVGL CLASS PROGRAMME Data communication cables – category cables	
IEC 61156-5	2020-04	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	Cat. 7 – 600MHz Cat. 7A – 1000MHz
ISO/IEC 11801	2017-11	Information technology - Generic cabling for customer premises - Part 1: General requirements	Reference to requirement for category cable: 7 (600MHz). 7A ( 1000 MHz )
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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60754-1	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	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%
NEK TS606 Ed5	2016-05	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Oil based mud must be added to IEC requirement: EDC 95/11 70°C 56d

### Marking of product

CAVICEL ITALY – P/102397 – CAT.7 – 600 MHz – ISO/IEC 11801 – IEC 61156-5 – 4x2x23 AWG – LSZH – IEC 60332-3-24 cat.C – Batch no. – Meter marking ( SHF1 or SHF2 )

CAVICEL ITALY – P/100679 – CAT.7 – 600 MHz – ISO/IEC 11801 – IEC 61156-5 – 4x2x23 AWG – LSZH – IEC 60332-3-24 cat.C – Batch no. – Meter marking ( SHF2 MUD )

CAVICEL ITALY – P/102397 – CAT.7A – 1000 MHz – ISO/IEC 11801 – IEC 61156-5 – 4x2x23 AWG – LSZH – IEC 60332-3-24 cat.C – Batch no. – Meter marking ( SHF1 or SHF2 )

CAVICEL ITALY – P/100697 – CAT.7A – 1000 MHz – ISO/IEC 11801 – IEC 61156-5 – 4x2x23 AWG – LSZH – IEC 60332-3-24 cat.C – Batch no. – Meter marking ( SHF2 MUD )

### 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