DNV·GL

Certificate No:
TAE00003J7

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Category cables

with type designation(s)
CAT 5E, CAT 6, CAT 6A, CAT 7 with properties acc. to DIN EN 60079-14 appendix E

Issued to
LEONI Special Cables GmbH
Friesoythe, Niedersachsen, 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.

Issued at **Hamburg** on **2019-07-15**
This Certificate is valid until **2024-07-14**.
DNV GL local station: **Hamburg CMC**

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.

Job Id: **262.1-029383-1**
Certificate No: **TAE00003J7**

Product description

Category cable CAT 5E, CAT 6, CAT 6A, CAT 7 with properties acc. to DIN EN 60079-14 appendix E

Conductor	Solid bare copper wire
Insulation	PE foam with skin
Cabling	Twisted pairs with aluminum foil and gap filling material, stranded tinned copper drain wire as central element or strain relief or both
Metallic covering	Tinned copper wire braid (55 % coverage) covered by a plastic tape
Sheath	SHF1

List refers to specification Version 2019-06-21 / F45052-F6700:

CAT 5E / CAT 6 / CAT 6A / CAT 7 cables:

LEONI Type Designation	AWG	Conductor cross section mm²	overall diameter in mm	optional metal covering *)	sheath material
02YSFCH 4X2X0.65/1.6-100 PIMF	22	0.34	9.3	-	SHF1
02YSFCH 4X2X0.60/1.43-100 PIMF	23	0.29	8.9	-	SHF1
02YSFCH 4X2X0.5/1.2-100 PIMF	24	0.21	8.2	-	SHF1

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 5E, 6, 6A, 7, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

Horizontal cables Cat. 5E, 6, 6A, 7 (can also be used for work area wiring)
Flame retardant in bunch; cat A.
Outer sheath SHF1

Temperature window for transport and fixed installation: -40°C to +80°C

Type Approval documentation

Data sheet :	L45467-J416-C796-EN
Test reports:	Leoni (witnessed by DNV GL) dated 04.03.2019 and 18.03.2019 MPA Dresden no 20181300/01, 2012-B-5236/03/04/06/07 Currenta no 19/0037, 19/0039, 18/0901, 18/0903 VDE 111109-9020-0001/47779-a FG42/hz-di Bayer 01/125 Leoni dated 29.01.2019

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: 5E (100MHz), 6 (250MHz), 6A (500MHz), 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: 5E (100MHz), 6 (250MHz), 6A (500MHz), 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 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
DIN EN 60079-14	2014-10	Explosive atmospheres - Part 14: Electrical installations design, selection and erection	Test acc. Appendix E

Marking of product

"sequential length in meter" * LEONI L SeaLine® * Leoni part number * nomenclature (type designation) CAT5E or CAT6 or CAT6A or CAT7 IEC 60332-3-22 SHF1 * "internal order number"

Example:

00020m * LEONI L SeaLine® * L45467-J416-C796 * 02YSFCH 4X2X0.6/1.43-100 PIMF CAT7 IEC 60332-3-22 SHF1 * 130180

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