DNV·GL

Certificate No:
TAE00003VK

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
Cat 5e Cable, F/UTP, LSZH, 4 Pair, AWG 24, Indoor,
Cat 6 Cable, F/UTP, LSZH, 4 Pair bonded, AWG 23, Indoor,
10GX Cat 6A+ Cable, U/FTP, LSZH, 4 Pair, AWG 23, Indoor,
10GX Cat 6A+ Cable, F/FTP, LSZH, 4 Pair, AWG 23, Indoor,
10GX Cat 6A+ Cable, S/FTP, LSZH, 4 Pair, AWG 23, Indoor

Issued to
Belden Inc.
Richmond, IN, USA

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

Application :

Data communication cables for indoor use. Cat Cable Installation / Horizontal cable. Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2020-02-12**
This Certificate is valid until **2025-02-11**.
DNV GL local station: **Houston, Approval CMC**

Approval Engineer: **Ivar Bull**

for **DNV GL**

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.

Job Id: **262.1-032398-1**
Certificate No: **TAE00003VK**

Product description

Type(s): **Cat 5e Cable, F/UTP, LSZH, 4 Pair, AWG 24, Indoor,**
Cat 6 Cable, F/UTP, LSZH, 4 Pair bonded, AWG 23, Indoor,
10GX Cat 6A+ Cable, U/FTP, LSZH, 4 Pair, AWG 23, Indoor,
10GX Cat 6A+ Cable, F/FTP, LSZH, 4 Pair, AWG 23, Indoor,
10GX Cat 6A+ Cable, S/FTP, LSZH, 4 Pair, AWG 23, Indoor

Conductors:	Solid Copper (Class 1)
Core insulation:	FPE foamed Polyethylene or PE Polyethylene (F/UTP types)
Individual screen (if any):	Al/PE tape, Aluminum facing outside (FTP)
Common Screen (if any):	Tinned copper braid min coverage 30% (S) or Al/PE tape with tinned copper drain wire (F)
Outer sheath:	SHF1

Electrical data at 20°C

Max DC Resistance:	95 Ohm/km
Max DCR unbalance between pairs:	4%
Max. DCR Unbalanced Within Pair:	2%
Max. Capacitance Unbalance :	1,600 pF/m
Max. Mutual Capacitance :	56 pF/m

Please refer to technical data sheet for detailed transmisson properties.

Application/Limitation

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

Temperature window

Operation:	- 40°C to +85°C
Installation:	- 15°C to +50°C

Place of manufacture :

DNV GL id: 10652058

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0403	2019-07	Data communication cables - category Cables.	
IEC 61156-5	2013-01	Symmetrical pair/quad cables for digital communications – Symmetrical pair/quad cables with transmission characteristics up to 1000MHz horizontal floor wiring.	Cat. 7 – 600MHz
IEC 60332-1-2	2004-07	Tests on electric and optical fibre cables	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 60754-1	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS
IEC 61034-1/2	2013-07/09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
ISO/IEC 11801	2010-04	Information technology – Generic cabling for customer premises, incl. Amd 1 and 2.	Ref. to requirements for category cable: 7 (600MHz)
EN 50173-1	2011-06	Information technology – Generic cabling systems – Part 1. General requirements.	
EN 50288-4-1	2013-06	Multi-element metallic cables used in analogue and digital communication and control - Part 4-1: Sectional specification for screened cables characterised up to 600MHz – Horizontal and building backbone cables	

Marking of product

BELDEN 1633VNH – 4PR24 SHIELDED LSZH – F/UTP CAT 5E IEC 60332-1-2 "manufacturing traceability" "meter marking" or

BELDEN 7860VNH – 4PR23 SHIELDED LSZH – U/FTP CAT 6 IEC 60332-1-2 "manufacturing traceability" "meter marking" or

BELDEN 10GXV03 – 4PR23 SHIELDED LSZH – U/FTP CAT 6A IEC 60332-1-2 "manufacturing traceability" "meter marking" or

BELDEN 10GXV01 – 4PR23 SHIELDED LSZH – F/FTP CAT 6A IEC 60332-1-2 "manufacturing traceability" "meter marking" or

BELDEN 10GXV02 – 4PR23 SHIELDED LSZH – S/FTP CAT 6A IEC 60332-1-2 "manufacturing traceability" "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