



Certificate No:
TAE00004FE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fiber optical cable

with type designation(s)

BELDEN Indoor/Outdoor Central Loose Tube 2-24 Fibers GUSNV

Issued to

Belden Wire & Cable B.V.
Venlo, Limburg, Netherlands

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Fiber optic cable. Loose tube.

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2022-02-23**

This Certificate is valid until **2027-02-22**.

DNV local station: **Netherlands FIS**

Approval Engineer: **Ivar Bull**

for **DNV**

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Trond Sjøvåg
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

Central Loose Tube cable.

BELDEN Indoor/Outdoor Central Loose Tube 2-24 Fibers GUSNV

Core: Central loose tube made of plastic, gel filled, containing 2-24 optical fibers selected from table below

Protection: Waterblocking glass yarns + tape

Outer sheath: SHF1

Available fiber types:

EMEA Coding pos 6	Single Mode fibers (SM)
7	9/125 G.655 C&D
8	9/125 G.652D & G.657A1 BI OS2
A	9/125 G.657A1 BI
F	9/125 G.657A2 BI
I	9/125 G.657B3 BI

EMEA Coding pos 6	Multi Mode fibers (MM)
1	62.5/125 OM1
2	50/125 OM2 BI
D	50/125 OM3 BI
E	50/125 OM4 BI
C	50/125 OM5 BI

Maximum attenuation increase [dB] depends on number of turns and radius. For details, please refer to Technical Data Sheet – Fiber properties – EMEA.

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.

Temperature ranges:

Operation: -30 °C to +70 °C

Installation: -5 °C to +50 °C

Storage: -30 °C to +70 °C

Cable minimum bending radius, operation: 76 mm

Cable maximum tensile strength operation: 500N

Type Approval documentation

Tests carried out

Standard	Year	Description	Requirement
DNVGL-CP-0402	2021-09	Class Programme DNV-CP-0402 Type approval of optical fibre cables.	Includes attenuation test, tensile strength test, crush test, impact test, torsion test, kink test and cable bend test.
IEC 60794-1-2	2021-1	Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures - General guidance, selected test E1, E3, E4, E6, E7, E10, E11, E11B,	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables	
IEC 60332-1-2:2004+AMD1:2015	2004	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame	Flame retardant small scale

Standard	Year	Description	Requirement
		propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	
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	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 >80%

Marking of product

BELDEN - GUSNV Fiber optical cable – No and types of fibers – IEC 60332-1-2 – IEC 60332-3-22 - metric marking – LOT No

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