



TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00004FD
Revision No:
1

This is to certify:

That the Fiber optical cable

with type designation(s)

BELDEN Fire Resistant Indoor/Outdoor Central Loose Tube Corrugated Steel Tape armour 2-24 Fibers GUCNV

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. Fire Resistant with water spray. Loose tube.

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

Issued at **Høvik** on **2023-11-27**

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

for **DNV**

DNV local unit: **Netherlands FIS**

Approval Engineer: **Ivar Bull**

Frederik Tore Elter
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

Fire Resistant Central Loose Tube cable.

BELDEN Fire Resistant Indoor/Outdoor Central Loose Tube Corrugated Steel Tape armour 2-24 Fibers GUCNV

Core: Central loose tube made of plastic, gel filled, containing 2-24 optical fibers selected from table below
 Protection: Waterblocking glass yarns + tape
 Armour: Corrugated steel tape
 Outer sheath: SHF1

Available fiber types:

| EMEA Coding pos 6 | Single Mode fibers (SM) | EMEA Coding pos 6 | Multi Mode fibers (MM) |
|-------------------|-------------------------------|-------------------|------------------------|
| 7 | 9/125 G.655 C&D | 1 | 62.5/125 OM1 |
| 8 | 9/125 G.652D & G.657A1 BI OS2 | 2 | 50/125 OM2 BI |
| A | 9/125 G.657A1 BI | D | 50/125 OM3 BI |
| F | 9/125 G.657A2 BI | E | 50/125 OM4 BI |
| I | 9/125 G.657B3 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

This cable is fire resistant according to IEC 60331-25 and EN 50200 PH120 and Annex E Water spray

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: 180 mm

Cable maximum tensile strength operation: 800N

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 | |

| Standard | Year | Description | Requirement |
|------------------------------|---------|--|---|
| IEC 60331-25 | 1999-04 | Tests for electric cables under fire conditions - Circuit integrity - Part 25: Procedures and requirements - Optical fibre cables | Flame application time 120 min + 15 min cooling down. Max attenuation on During fire: 0,01 dB During cool down: 0,01 dB |
| EN 50200–PH120 | 2015-12 | Method of test for resistance to fire of unprotected small cables for use in emergency circuits – PH120 and | Flame application time 120 min. Survival time 120 min. Max attenuation in fibres during fire: 0,39 dB |
| EN 50200–Annex E | 2015-12 | Method of test for resistance to fire of unprotected small cables for use in emergency circuits – Annex E Water spray. | Flame application time 30. Water spray applied 15 min after start of test. Survival time 30 min. Max attenuation in fibres during fire: 0,325 dB |
| 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 propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame | Flame retardant small scale |
| 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 >60% |

Marking of product

BELDEN - GUCNV Fiber optical cable – No and types of fibers - IEC 60331-25 [120 min] – EN 50200 PH120 Annex E [30 min] - 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