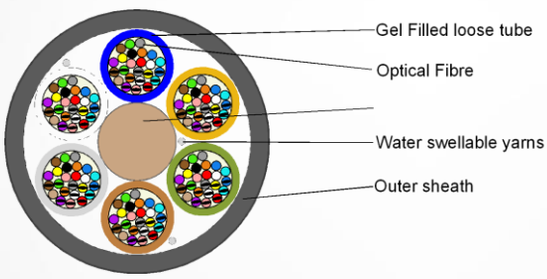
# Cable Proposal CP4111

## Preliminary Design

FibreFlow

### 144F 6x24F G657A1 Mini Cable




## Product Description

Cable consists of stranded core with central strength element (FRP) and gel filled loose tubes with optical fibers. Stranded core is fixed by water swellable yarns. Outer sheath is made of polyamide PA12. Color of outer sheath is black.

## Application

For blowing in duct or micro duct.

## Benefits

- All-dielectric design
- UV-resistant

## Optical fibres and loose tubes colour identification

| No. | Colour (fibres/tubes) | No. | Colour(Fibres) |
|---|---|---|---|
| 1 | Blue | 13 | Blue + 1 ring |
| 2 | Orange | 14 | Orange + 1 ring |
| 3 | Green | 15 | Green + 1 ring |
| 4 | Brown | 16 | Brown + 1 ring |
| 5 | Grey | 17 | Grey + 1 ring |
| 6 | White | 18 | White + 1 ring |
| 7 | Red | 19 | Red + 1 ring |
| 8 | Black | 20 | Natural |
| 9 | Yellow | 21 | Yellow + 1 ring |
| 10 | Violet | 22 | Violet + 1 ring |
| 11 | Pink | 23 | Pink + 1 ring |
| 12 | Turquoise | 24 | Turquoise + 1 ring |

Other colours upon request

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## Cable marking example

Marking is made on each meter of the cable.

Fibre optic Cable =EMTELLE= DPO PA 144U (6x24) 300N 2019 =0001m=

Marking description:
EMTELLE – company name;
DPO – type of the cable;
PA – outer sheath material (polyamide PA12);
144 – number of optical fibers in cable;
U – type of optical fibers (single-mode fiber according to G.652D+G.657.A1);
6 – number of loose tubes;
24 – number of optical fibers per loose tube;
300 N – maximum allowed tensile strength;
2019 – year of production;
0001 m – meter marking.
Additional information in cable marking upon request.

## Design Details

| | |
|---|---|
| Number of optical fibres in cable | 144 |
| Number of loose tubes | 6 |
| Number of optical fibres per loose tube | 24 |
| Diameter of CSM, mm | 1.6 |
| Loose tube diameter, mm | 1.5 |
| Outer sheath thickness, mm | 0.4 |
| Cable diameter, mm | 5.4 |
| Cable weight, kg/km | 18.7 |

## Optical Fibre

| | |
|---|---|
| Fibre type | <<U>> |
| Fibre Brand | Corning<br>SMF 28®ULTRA, SMF 28+®BB |
| ITU-T Recommendation | G.652D + G.657.A1 |
| Dimensional Specifications | |
| Core-Clad Concentricity | 0.5µm |
| Cladding Diameter | 125±0.7µm |
| Cladding Non-circularity | 0.7% |
| Coating Diameter | 200±5µm |

## Transmission specifications

| Fibre Brand | SMF 28®ULTRA | SMF 28+®BB |
|---|---|---|
| Attenuation in the cable (dB/km):<br>1310nm wavelength<br>1550nm wavelength (Typical*/Max) | <br>0.32<br>0.19/0.20 | <br>0.34<br>0.21/0.22 |

*Typical attenuation is the real level of optical attenuation of at least 90% fibres after cabling.

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## Operating parameters

| | |
|---|---|
| Operating temperature (Δα≤0.05dB/km) | -30°C…+70°C |
| Operating temperature (Δα≤0.10dB/km) | -40°C…+70°C |
| Installation temperature | -30°C…+50°C |
| Transportation and storage temperature | -60°C…+70°C |
| Minimum bending radius of the cable | 15 diameters of cable |
| Life time | 25 years |

## Cable parameters

| Parameter | Nominal Value | Evaluation |
|---|---|---|
| Tensile strength (0.2% fibre stress)<br>(IEC 60794-1-21 method E1) | 300N | -Δα≤0.05dB after test<br>-no damage |
| Crush<br>(IEC 60794-1-21 method E3) | 0.05kN/cm | -Δα*≤0.05dB<br>-no damage |
| Repeated bending<br>(IEC 60794-1-21 method E6) | 20 cycles, ±90°, bending radius 80mm | |
| Torsion<br>(IEC 60794-1-21 method E7) | -10 cycles<br>-torsion angle ±360° length 4m | |
| Impact<br>(IEC 60794-1-21 method E4) | Impact energy 5J | |
| Water penetration<br>(IEC 60794-1-22 method F5C) | Sample length: 3m<br>Testing time: 24hours | No water at end of the sample |
| Temperature cycling**<br>(IEC 60794-1-2 method F1) | -temperature range from -30 to 70°C<br>-temperature range from -40 to 70°C<br>-2 cycles<br>-cycle period ≥16 hours | Δα*≤0.05dB/km<br>Δα*≤0.10dB/km |
| Compound flow<br>(IEC 60794-1-21 method E14) | At 70°C | No dripped compound |

*attenuation increasing at standard wavelengths.
**other temperature range upon request.

## Packing and Marking

Cables are supplied on the wooden drums. Barrel diameter is not less than 40 diameters of the cable. Not less 2 m long bottom end of the cable is fixed to drum flange. The ends of the cable are closed by waterproof covers.

The label on the drum flange contains trademark, type of the cable, production date, cable length, gross weight.

Following information is printed on the drum flange: drum number, notice “do not lay flatwise”, allowed rotation direction.

Passport of the cable contains type of the cable, technical standard number, cable length, fiber type, colors of the fibers, distribution of the fibers in the loose tubes, colors of the loose tubes, attenuation for each fiber, refractive index of the fiber, fiber manufacturer and production date.
Passport in plastic bag is fixed to the inner flange.
Additional information in the passport upon request.