

CORNING

Cable Systems

**SPECIFICATION REFERENCE : MFN01 - 02
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***SPECIFICATION FOR 216 and 432 FIBRE
UNARMoured CABLE FOR***

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Signed :

Date :

This specification has been produced by :

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OPTICAL CABLE SPECIFICATION

1. Scope

- 1.1 This document details external cables generally for installation in an underground duct environment.
- 1.2 The cable shall contain 216 or 432 optical fibres and one copper pair.

2. Fibres

- 2.1 Fibres supplied against this specification must meet the requirements of Corning LEAF⁹⁰⁰ Fibre as documented in PI1107. The fibre shall also meet the requirements of ITU-T recommendation G655.

2.2 Attenuation of Cabled Fibres

Attenuation at 1550nm	Typical	0.22 dB/Km
	Maximum	0.26 dB/Km

3. Design and construction

A typical cable construction can be seen in Appendix 1 for the 216 fibre cable and Appendix 2 for the 432 fibre cable.

3.1 Strength Member

3.1.1 A strength member shall be incorporated in the cable. The cable strength member is to be manufactured from a non-metallic material and is to be located centrally within the core. Peripheral strength members may also be used, if required.

- 3.1.2 The diameter of the strength member shall be at the discretion of the manufacturer to allow best fit with the fibre units and such that performance requirements against this specification are met.

3.2 Loose Tubes

- 3.2.1 Each fibre unit (loose tube) shall contain 12 fibres, and shall include a suitable filling compound to prevent the ingress of moisture.
- 3.2.2 Individual fibres within each unit shall be coloured in accordance with Table 1.
- 3.2.3 The diameter of the loose tube units shall be between 2.3 and 2.7mm diameter.

Table 1 : Colour of fibres in tubes

Fibre	Colour	Fibre	Colour
1	Blue	7	Red
2	Orange	8	Black
3	Green	9	Yellow
4	Brown	10	Violet
5	Grey	11	Pink
6	White	12	Turquoise

3.3 Cable core

Tubes shall be S-Z stranded around the central strength member. Up to three layers of tubes may be used as necessary in order to provide the necessary fibre count. The cable core shall be dry and fully water blocked with water swellable materials.

One copper pair shall be included in the cable construction.

On the 216 fibre cable, reference marker units shall be used on the inner layer. These shall be permanently coloured red and green respectively and the remainder shall be natural. All tubes on the outer layer shall be natural. Tube identification on the outer layer is by virtue of the relative positions on the filler and copper pair.

On the 432 fibre cable, each layer shall contain red and green reference marker tubes and the remainder shall be natural.

3.4 Core Binding

Where required, the completed cable core shall be bound helically or longitudinally using either tapes or yarns.

3.5 Ripcord

One non-metallic ripcord shall be laid longitudinally under the sheath to facilitate cable preparation.

3.6 Polyethylene Sheath

A polyethylene sheath with a minimum thickness of 1.4mm, and nominal thickness of 1.5mm is to be applied over the cable core. The sheath shall contain 2.5% Carbon black suitably blended to prevent any deterioration due to UV radiation. The sheath shall be free from pin holes, joints and any other defects, shall be reasonably circular and the outer surface shall not be concave at any point.

The colour of the sheath shall be black.

3.7 Cable sheath marking

Each cable is to have the following information clearly marked on the sheath at intervals which do not exceed 1m :

“ CORNING MMFN XXX NZ-DSF month / year “

where XXX represents the fibre count of the cable, 216 or 432

The cable is length marked every metre.

The marking is to be white.

4. Performance requirements

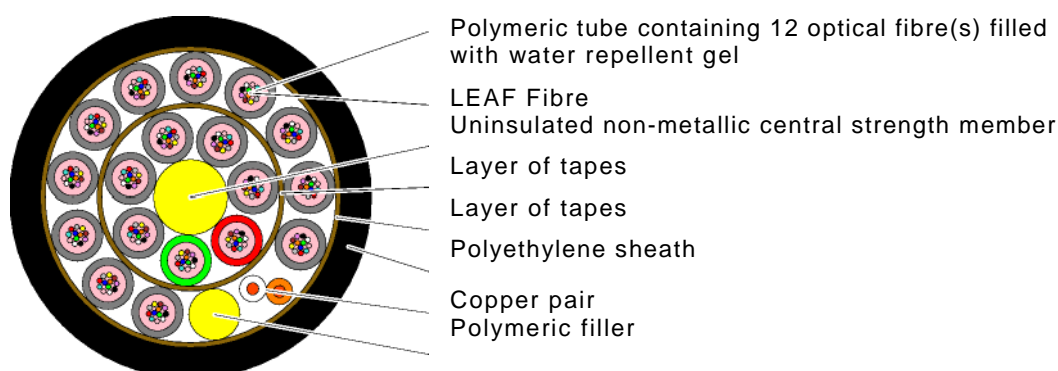
Mechanical and Environmental Characteristics

All tests are to be carried out to the relevant IEC 60794-1-2 specification.

Test	Specified Value	Acceptance Criteria
Tensile Performance	216 fibre - 2460 N 432 fibre – 5500 N	Da reversible, no residual fibre strain
Crush	2.0 kN /100mm, 15 min	Da £ 0.05 dB
Impact	15 Nm, r=300mm, 3 impacts	Da £ 0.05 dB
Repeat Bending	20 x cable outer diameter 35 times	No damage
Torsion	2m ± 360°, 100N	Da £ 0.05 dB/fibre
Cable Bend	10 x cable outer diameter, 5 turns	Da £ 0.05 dB
Temperature Cycling	-25°C - +60°C	Da £ 0.1 dB/km
Storage & Transport Temperature Range	-40°C - +70°C	No damage
Water Penetration	3m cable, 1m water, 72h	No water leakage
Polarisation Mode Dispersion		£ 0.12 psec/±km LDV

Appendix 1

Drawing 0097DJW2 - 216 fibre loose tube cable.



Cable Dimensions:

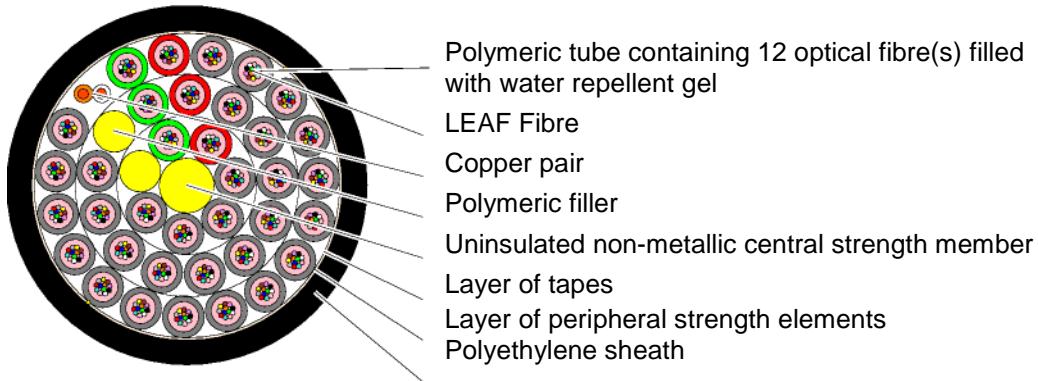
Central strength member 3.60 mm
Tube dimensions 2.5 mm diameter 1.80 mm bore
Diameter over loose tubes 14.1 mm
Diameter over outer sheath..... 17.5 mm
The cable core is water blocked with swellable materials.

Mechanical and Environmental Characteristics:

Cable weight 209 kg/km
Maximum pulling tension. .. 2466 N Operating-25 to 60°C temperature
Minimum bend radius..... 175 mm
Maximum crush 2,000N/100m
resistance m

Appendix 2

Drawing 0116cjp1 - 432 fibre loose tube cable.



Cable Dimensions:

Central strength member	3.3	mm	
Tube dimensions	2.5	mm diameter	1. 80 mm bore
Diameter over loose tubes	18.5	mm	
Diameter over outer sheath.....	21.9	mm	

The cable core is water blocked with swellable materials.

Mechanical and Environmental Characteristics:

Cable weight	332	kg/km	
Maximum pulling tension. ..	5500	N	Operating temperature
Minimum bend radius.....	219	mm	-25 to 60°C
Maximum crush resistance	2,000	N/100m	
		m	