



Proximus's Reference ULLOffer

Annex Jg

Characteristics of Cabling

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1. Transmission properties of the access network

1.1 Generalities

- 1 A subscriber loop consists of sections of twisted pairs cables of different gauges. All the sections are buried and connected together by means of electrical joints, called splices, directly placed in the ground or sometimes in a manhole.
- 2 In the ideal situation, the Access Network has a star configuration with the feeder cable bundles going from the main distribution frame to the street cabinet. From the street cabinet, via distribution cables and drop wires, the wire pairs are terminated at the NTP (Network Termination Point) in the individual customer sites. The reality shows that cable arrangements leads sometimes to a meshed structure in the feeding network.
- 3 Each telecom cable consists of a number of copper conductors grouped in quads; these quads can be arranged in bundles or in layers, depending on the type of cable.

1.2 Physical characteristics of the cables

- 4 A conductor can be isolated by a layer of paper (in the old generation cables) or synthetic material, usually polyethylene.
- 5 Most of the conductors have a 0.5 mm or 0.6 mm diameter; distant customers however needs to be connected via conductors of 0.8 and 1.0 mm; 2000 pairs cables going out of the central office are sometimes made of 0.4 mm conductors.
- 6 In paper insulated cables, the conductors are surrounded by a lead sheath, generally protected by armouring and polyethylene sheath.
- 7 In plastic insulated cables used in the distribution network, the conductors are surrounded by a polyethylene sheath.
- 8 In plastic insulated cables used in the feeding network, the conductors are surrounded by an aluminium screen, a polyethylene internal sheath, an armouring and a polyethylene external sheath.
- 9 The plastic cables are in the majority of the cases longitudinally waterproof.

1.3 Electrical characteristics of the cables

- 10 The table below gives some typical characteristics of the access network cables [figures given by the cable manufacturers or by measurements in the field]

Diameter	LR	KC	A800	A40.000	A150.000	A300.000
0.4 mm	275	55	2.0	7.5	11.5	14.5
0.5 mm	180	50-55	1.3	6	9	11
0.6 mm	123	38.5-46	1.0	4	6	8
0.8 mm	69	38.5	0.7	2.5	4	5.5

LR = Loop Resistance in ohm/km

KC = average Kilometric Capacity in nF/km (it depends on the type of cable)

A800 = Attenuation measured at 800 Hz in dB/km

A40.000 = Attenuation measured at 40.000 Hz in dB/km

A150.000 = Attenuation measured at 150.000 Hz in dB/km

A300.000 = Attenuation measured at 300.000 Hz in dB/km

- 11 NB: the attenuation values are conditional. The reader must note that these figures are given for cable. A loop is made of several pieces of cables and then additional attenuation and reflections due to the splices and the different cable gauges will occur.
- 12 For the insulation resistance between the 'a' and 'b' wires of a pair (without terminal equipment) or between wire and earth, reference is made to Annex C : Technical Specifications.