

Cable Selection Guide for Optical Fibre Cables

Optical Fibre cables manufactured by CBI Electric Telecom cover a variety of applications and are suitable for installation indoor and outdoor, ducts, trays, direct buried, aerial routes and in mine shafts. Generally all cables can be supplied with either single mode or multimode fibres.

In selecting a cable for a particular application a number of factors have to be considered, some of which are discussed below.

- Network in which the cable will be installed
- Environmental conditions

Networks

Essentially the network system will determine what the fibre and cable type will be. In designing or selecting cables for a network the following criteria must be addressed;

- What signals need to be transceived?
 - This will determine the bit rate on the cable.
- What types of fibre are available/required?
 - By rule of thumb networks such as in small buildings and data centres will require multimode fibres whereas the larger networks such as FTTx, townhouse complexes and long distance will utilise singlemode fibres.
- How many fibres are available/required?
 - For existing networks and where there is a shortage of fibres multiplexing may have to be employed which is expensive. With new networks on the other hand it is best to make allowance for future expansion by providing extra fibres.
- What is the power budget or allowed power loss of the system?
 - Power losses occur in cables, patch panels, connectors and splices. All of these have to be considered if compliance with the power budget is to be achieved.
- What is the dispersion limit of the system?
 - Whilst dispersion can be more of a problem with single mode fibres, if exceeded it could cause bit errors which in turn could result in data errors.
- What is the cable route?
 - Methods of laying the cable along the route include aerial, direct burial or in microducts. The first two methods are straight forward however where microducts are used then “microduct cables” must be used. Our Microduct products are available in Single Microducts (32 & 40mm) and Bundled Microducts (5mm – 18mm).

Environmental Conditions

- maximum operating conditions
- presence of chemicals/moisture
- abrasion and/or cut through resistance
- fire retardancy
- installation route ie; duct, tray, aerial etc.

Outer sheath material must be compatible with environment conditions.

Containment	PE
Acids – diluted	E
Acids – Concentrated	G
Alcohols – aliphatic	E
Aldehydes	G
Bases/Alkali	E
Esters	G
Hydrocarbons – aliphatic	F
Hydrocarbons – aromatic	N
Hydrocarbons – halogenated	N
Ketones – aromatic	N
Oxidizing Agents - strong	F

Standard Cable Range

Cable Design

CBI Telecom offers a range of Optical Fibre cables suitable for both indoor and outdoor installations. These products are available in a number of configurations each dependent upon the required application.

All cables are reviewed frequently to take advantage of developments in material technology.

Two fibre types are available, namely;

- Singlemode
- Multimode

Fibre containment is achieved by means of either Tight Buffer, Loose Tube gel filled/unfilled or Micro Modules all of which to varying degrees provide a measure of protection against extreme elements.

Certain cables will require a bedding sheath and include long span aerial and armoured constructions. Depending upon cable type the material shall be polyethylene of low smoke zero halogen for example in the case of mines.

Cable tensile strength is provided mainly through the central strength member, Aramid yarns, glass yarns or steel wire or corrugated steel tape armouring

Armouring shall be either steel wire or corrugated steel tape or a combination of both as for mine shaft cables.

Selection of sheath material is dependent upon the area where the cable will be installed. The sheath shall be either black UV resistant, Polyethylene or LSZH. The choice of black is for cables exposed to direct sunlight. Fire retardancy of the LSZH sheathed cables shall comply with IEC60332-1 and are suitable for indoors, mine shaft and overhead rack and tray installations.

Packaging

All cables are supplied on sturdy non-returnable wooden cable drums constructed from timber which has been treated with a preservative. Both ends of the cable fitted with end caps to prevent moisture ingress to the cable. The free end of the cable is fastened to a drum flange to prevent uncoiling during transportation. Wooden lags are nailed side by side over the rims of the drum flanges to protect the cable. Steel strapping is then applied around the lags to keep them in place.

Transport

Drums must be transported in accordance with all the requirements of SANS 10198 as applicable.

Drums must only be rolled in the direction indicated by the arrow painted on the flange. Preferably, drums must be moved by forklift or crane using a suitable steel shaft and slings with spreader to prevent damage to the flanges.

On no account should drums be laid flat on their flanges. Drums shall be secured to the truck with either suitable wooden chocks or slings or chains fed through the spindle holes in the drum flanges. Use must be made of a fork lift or crane to offload the drums from the truck. Drums should never be rolled off the truck onto the ground.

Storage

Always store drums with their flanges in a vertical position and adjacent drums with their flange(s) touching. If drums are stacked on top of one another, make sure that each end drum of the bottom row are suitably chocked. The storage surface should be hard and well drained. If a length of cable is cut from a drum, the end on the drum should be sealed again with an end cap to prevent moisture ingress.

Installation

All cables must be installed in accordance with international standards eg. IEC60794-1-21. Failure to do this will invalidate CBI Telecom Cables' product warranty.