

Optical Glass Fibres

Multimode graded index type

Specifications

General

This document is a specification for the optical glass fibres which are used for communication purposes by ABB's protection and control products.

Glass fibre

The glass fibres to be used must comply with the specifications of this document and the international standard ISO/IEC 11801.

The glass fibre must be of the multimode graded-index type. Multimode means that there are several paths for light rays to travel. Graded-index means that the refractive index varies with the distance from the fibre axis. This means that the light ray will refract in small steps and the pulse will keep its shape better than, for example, when step index fibres are used.

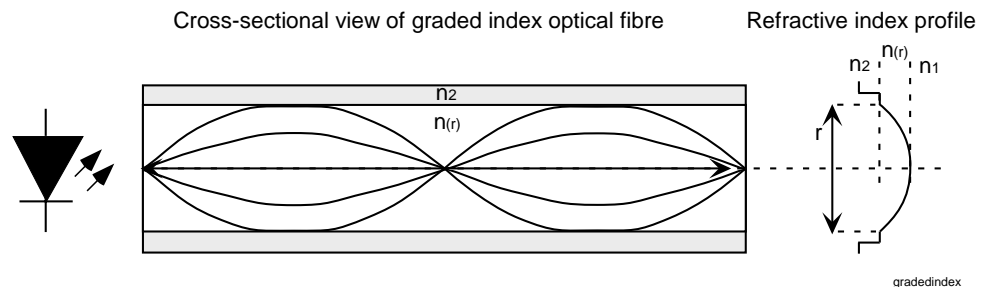


Fig. 1 The idea of graded index fibre

Polishing

There are several different forms and polishing methods for finishing the fibre tip. Polishing gives a clear window for the light to travel to and from the fibre. The function of the fibre tip form is to avoid reflections. Reflections cause problems when light is reflecting and travelling in the fibre among true data. A plane fibre tip is the most sensitive type regarding back reflection.

The tip of the glass fibre must be polished into a spherical shape, to avoid problems caused by back reflections.

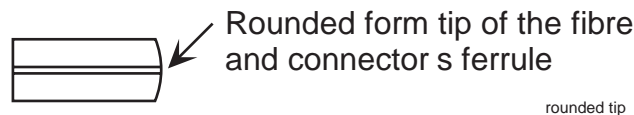


Fig. 2 Round shape tip of the fibre.

Connector

The supported connector type for glass fibres is ST which is widely used in industrial and electrical protection and control applications.

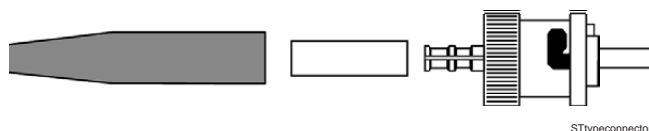


Fig. 3 ST type connector.

Specifications

Type:	Multimode graded index OM1 (ISO/IEC 11801)
Diameter:	62.5/125 µm core/cladding
Attenuation:	max 3.5dB/km at 850nm wavelength
Tip polishing shape:	rounded fibre tip, see fig. 2
Connector:	ST-type

Ordering fibres

The glass fibres, used with ABB substation automation products, must comply with the specifications of this document. The coat and protection of the fibre can be chosen according to the application requirements.

The star topology protocols, LON and IEC 60870-5-103, require duplex fibres, which means that two fibres are combined to a fibre pair for one connection. The loop topology protocols, SPA, require simplex fibres, which means that just one fibre is required to connect two devices.

You can order fibres of fixed lengths from well-known manufacturers or distributors. The design rules of different communication protocols for cable lengths and system constructions must always be followed.

Manufacturers

There are many reliable manufacturers around the world, who can deliver the specified fibres. We have successfully tested fibres from the following manufacturers:

Draka NK Cables

Brügg Kabel AG



ABB Oy
Distribution Automation
P.O. Box 699
FI-65101 Vaasa
FINLAND
Tel. +358 10 22 11
Fax. +358 10 224 1094
www.abb.com/substationautomation