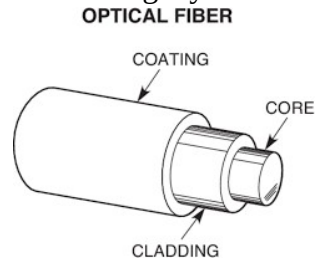


## Principle and propagation of light in optical fibres

Optical fibres are the light guides used in optical communications as wave-guides. They are thin, cylindrical, transparent flexible dielectric fibres. They are able to guide visible and infrared light over long distances. The working structure of optical fibre consists of three layers. Core- the inner cylindrical layer which is made of glass or plastic. Cladding- which envelops the inner core. It is made of the same material of the core but of lesser refractive index than core. The core and the cladding layers are enclosed in a polyurethane jacket called



sheath which safeguards the working structure of fibre against chemical reactions, mechanical abrasion and crushing etc

### Propagation mechanism in Optical fibre:

In optical fibres light waves can be guided through it, hence are called light guides. The cladding in an optical fibre always has a lower refractive index (RI) than that of the core. The light signal which enters into the core can strike the interface of the core and the cladding at angles greater than critical angle of incidence because of the ray geometry. The light signal undergoes multiple total internal reflections within the fibre core. Since each reflection is a total internal reflection, the signal sustains its strength and also confines itself completely within the core during propagation. Thus, the optical fibre functions as a wave guide.