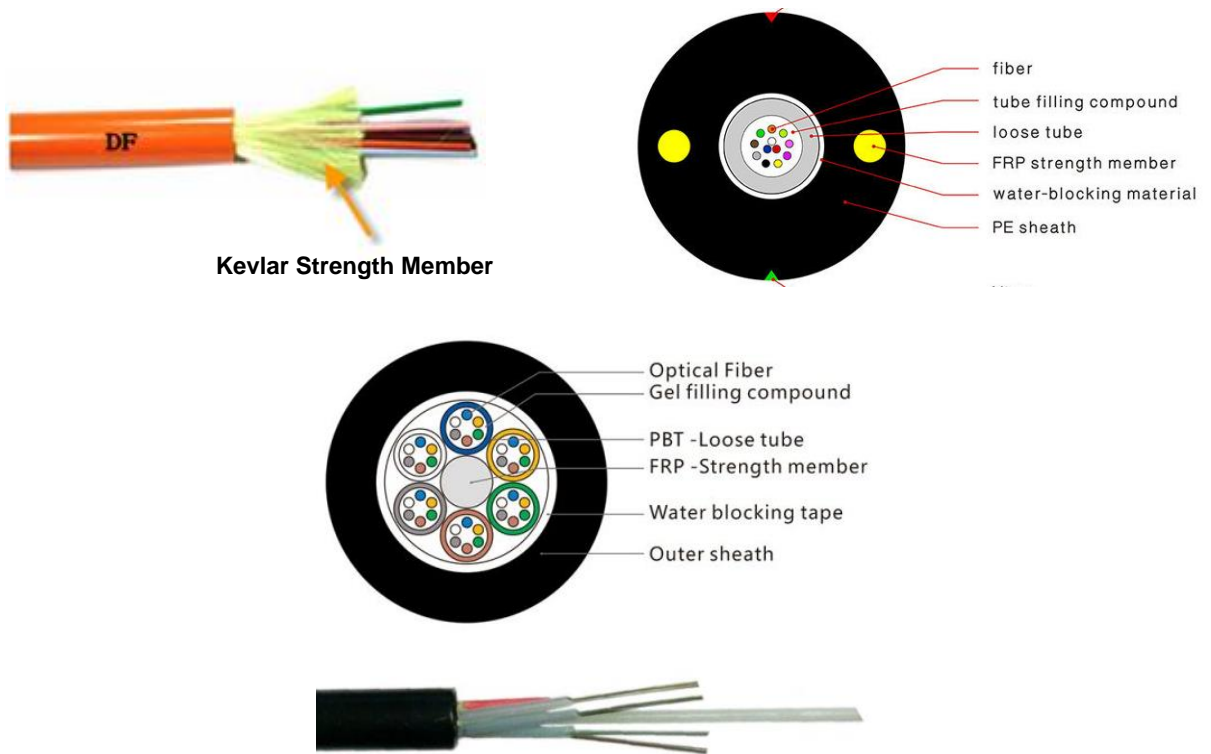


The Basics of Fibre Cable Installation

- Check continuity and attenuation of the cable before installation.
- The cable should never be directly pulled on the sheath itself.

With Tight Buffer cables strip off 500 to 800mm of sheath to expose the Kevlar strength member and use the Kevlar to pull the cable in.

With Loose Tube, remove the sheath and pull on the central or side strength member/members.



Kevlar Strength Member

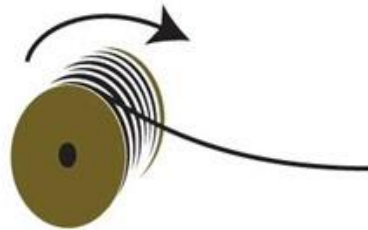
Optionally on Military or TPU Tight Buffer cables, the jacket can be tied into a tight knot and the pulling done on the cable end, (past the knot) and after pulling in the cable, the knot should be cut off.



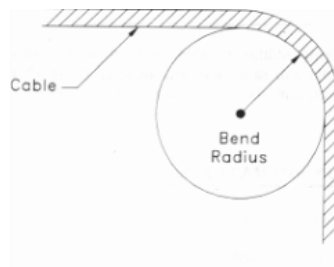
Pre-terminated cables should be requested with pulling socks to protect the pre-terminated ends during the pull.



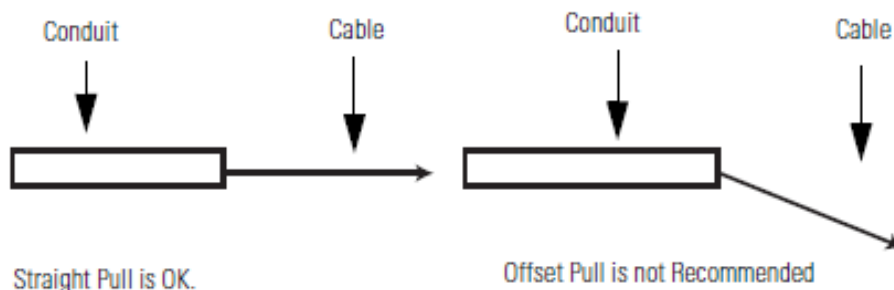
- Roll the cable off the spool, don't put the drum on its side and spin/flick it off the end. This will put a twist in the cable and can stress the fibres.



- Never exceed the maximum pull Tension, this can stress/break the fibre and damage the cables construction and strength.
- Pull, do not push Tight buffer cables. Pushing can result in exceeding the bend radius of the fibre/cable.
- Never exceed the cable bend radius. Exceeding this will harm the fibre but the issues may not show up for a number of years. The Bend radius will be stated in the cable specification. Should there be no cable information available, the common rule of thumb is, under tension during pulling, 20 times the diameter of the cable and when not under tension (after installation), the minimum recommended long term bend radius is 10 times the cable diameter.

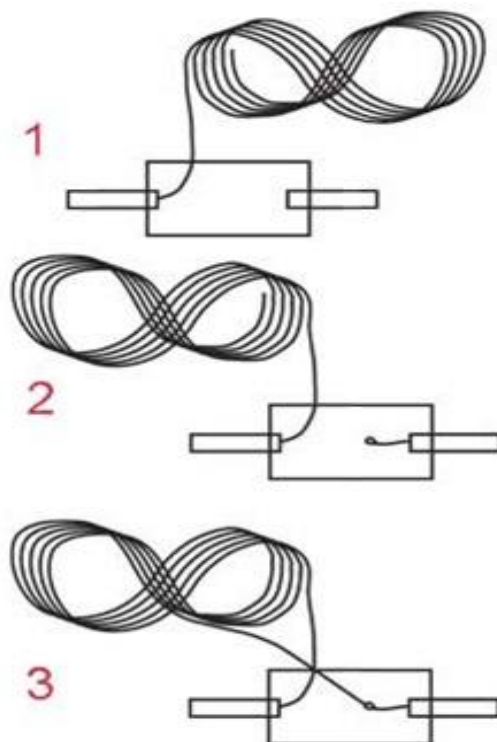


- When pulling cable from a conduit make the pull as straight an angle as possible. Pulling on an angle can cause damage to the cable.



- Avoid placing cable reels on their sides or subjecting them to shock from dropping, as the coils of fibre inside the drum can slip down inside each other and tangle.

- Midspan access of fibres in buffer tubes: To minimize fibre damage, use a Midspan Access Tool to open the buffer tube such as the tools **sold by atg technology**.
- Comply with vertical rise limits of the cable. Exceeding this limit can result in fibre breakage, or excess attenuation, ensure the cables are tied off at distances less than this limit. In Loose Tube cables, fibres and Gel can migrate from cables, to prevent this loop the cable about every 3-5m in the riser.
- Attach cables with ties having large surface areas. Avoid pinching or squeezing cable. Ties should be installed manually with gentle pressure.
- On long runs, use proper lubricants but make sure they are compatible with the cable jacket.
- On really long runs, pull from the middle of the network out to both ends. If possible, use an automated winch with tension control or a breakaway pulling eye rated to the cable maximum pull tension. Also, a swivel pulling eye is helpful because pulling tension will cause twisting forces on the cable.
- Figure 8 technique. Divide long pulls into several shorter pulls, using the figure 8 technique for storing cable at the intermediate locations. This pattern is large, at least 3-6m from top to bottom of the pattern. When all the cable is placed in this pattern, the pattern is lifted and flipped over, so that the loose end is on top. This loose end is pulling into the next section of conduit or duct. This pattern minimizes the accumulation of cable twist



- Leave service loops. These will allow you to pull excess cable into a location where you have experienced a problem or if there is a future expansion of the network or a future cable cut that needs some fibre pulled back to repair it. It is much cheaper to pull in a service loop than to replace an entire run of fibre cable.
- With aerial cable allow for thermal expansion and contraction. Manufactures will supply Sag tables but a good rule of thumb is about 500mm of sag for every 500m. Failure to allow for thermal expansion can result in increased attenuation and breakage of fibres.
- When catenary wire is used for aerial installation, avoid zigzagging the messenger wire from one pole side to the other. Instead, make sure it is kept on one side as much as possible.
- Try to design the conduit run with as few bends as possible. If there are too many bends in the run then you may consider installing junction boxes in lieu of bends. A common rule of thumb in duct/network design is the number of 90 degree turns on a pull shall not exceed 6 for aerial cables and 4 for underground cable-in-conduit.
- Ducts should be sized to meet present and future cable installation requirements. A maximum 40% fill ratio is a good rule of thumb to follow for duct size.
- After duct installation you should consider sealing the ends of the ducts to provide an effective water seal and keep rodents and debris from the ducts, which will make future installation easier.
- Follow local Building and Fire Codes: Be sure to "firestop" all cables that penetrate a firewall.



See atg web site www.atgltd.co.nz
Under Clean Inspect and Hand tools for greater detail on
these tools.

