

# Technical Note

## TN34: Recommendations for the pulling in of Excel Hybrid Fibre Optic cables



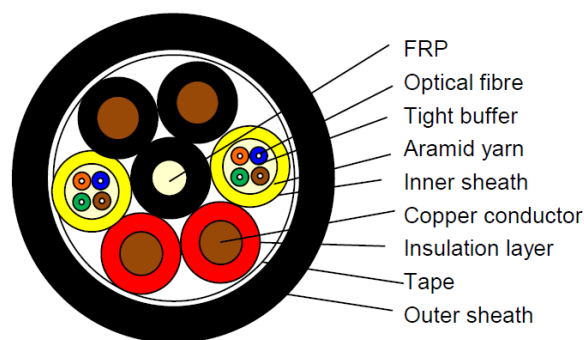
### Overview:

Installation methods for both wire and optical fibre communications cables are similar. Fibre cable is designed to be pulled with much greater force than copper wire if pulled correctly, but excess stress on the cable may harm the fibres, potentially causing eventual failure. Particular care should be taken during installation to prevent kinking the cable which can harm the fibres.

Excel Hybrid Fibre Optic cables comprise of both Solid copper and Optical fibre elements. Due to the hybrid construction of the cable as such there are a number of points to be considered before and whilst installing the cable.

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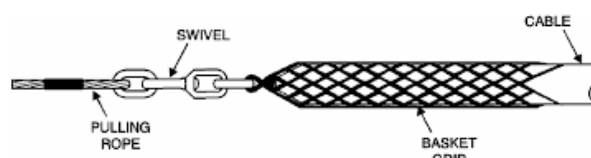
### Pulling Tension

Excel has installed a Fibreglass Reinforced Plastic strength members, for pulling. The fibre optic cable should only be pulled by these strength members. Any other method may put stress on the cable and damage the component factors.

Never exceed the maximum pulling load rating. On long runs, use proper lubricants and make sure they are compatible with the cable jacket. On really long runs, pull from the middle out to both ends. If possible, use an automated puller with tension control or at least a dedicated breakaway pulling eye. Consult the cable technical data sheet for the maximum load rating of the cable and suppliers of conduit, innerduct, and cable lubricants for guidelines on tension ratings and lubricant use.

### Cable Swivels

Swivels or breakaway fuses should be used if cables are being pulled externally regardless if the method involved is mechanical or manual (x2 adult males could generate up to 60nm [600lb load])



*This Technical Note has been produced by Ian McKiernan, Technical Pre-Sales Manager, on behalf of Excel*

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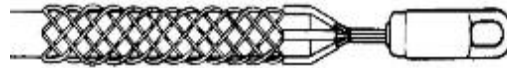
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### Cable Grip

Cables should not be pulled by the jacket unless with a cable grip, these should be fixed to the strength member also



### Pulling Rope

An 8mm polyester or polyaramid pull rope must be used for optical fibre cables that are to be pulled in by hand. When using a hauling winch, a 12,5mm or thicker polyester or polyaramid rope should be used as a hauling rope.

#### Advisory Note

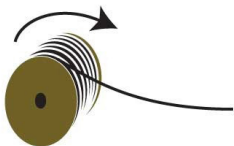
Ropes manufactured from nylon are not suitable as their stretch factor is too high and they can potentially cut into ducts. Steel hauling rope or galvanised wire must never be used as they can damage ducts and/or cables

### Bend radius

Bending of a fibre optic cable can damage the cable if the radius of the bend is too small. The normal recommendation for fibre optic cable bend radius is the minimum bend radius under tension during pulling is 20 times the diameter of the cable. When not under tension (after installation), the minimum recommended long term bend radius is 10 times the cable diameter.

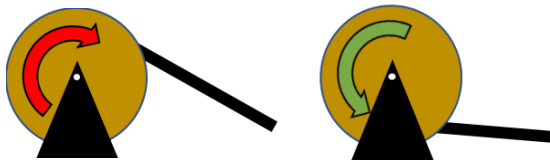
### Avoid Twisting

Always roll the cable off the spool instead of spinning it off the spool end. This will put a twist in the cable for every turn on the spool! Never twist the fibre cable. Putting a twist in the cable can stress the fibres too



#### Advisory Note

Pulling cable of the top of a reel/drum creates inertia which, if uncontrolled can cause the reel/drum to become unstable and in extreme cases unseat from its axle stands or rollers towards the operative.



Pulling off the bottom of a reel/drum the direction it travels will be away from the operative.

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