

Assembly instructions for pre-assembled cable tension members

1. Area of application:

These instructions apply to PFEIFER cable tension members in compliance with European Technical Approval ETA-11/0160.

2. Other applicable techn. documents

- European Technical Approval ETA-11/0160
- PFEIFER Catalogue "Cable Structure" (section 3)
- DIN 1076 "Engineering construction work within the scope of roads and pathways"

3. Supply and laying out of cable tension members

The cables has been stretched and marked under load in the manufactory. In this process cable creep and cone setting was considered. Therefore the cables will be "shorter" delivered on site. This can lead to a higher force during installation.

If no other agreements are made, 20°C was taken as a basis.

Cable tension members are generally supplied to the site on rings or coilers (Pfeifer Catalogue "Cablestructures", section 5).

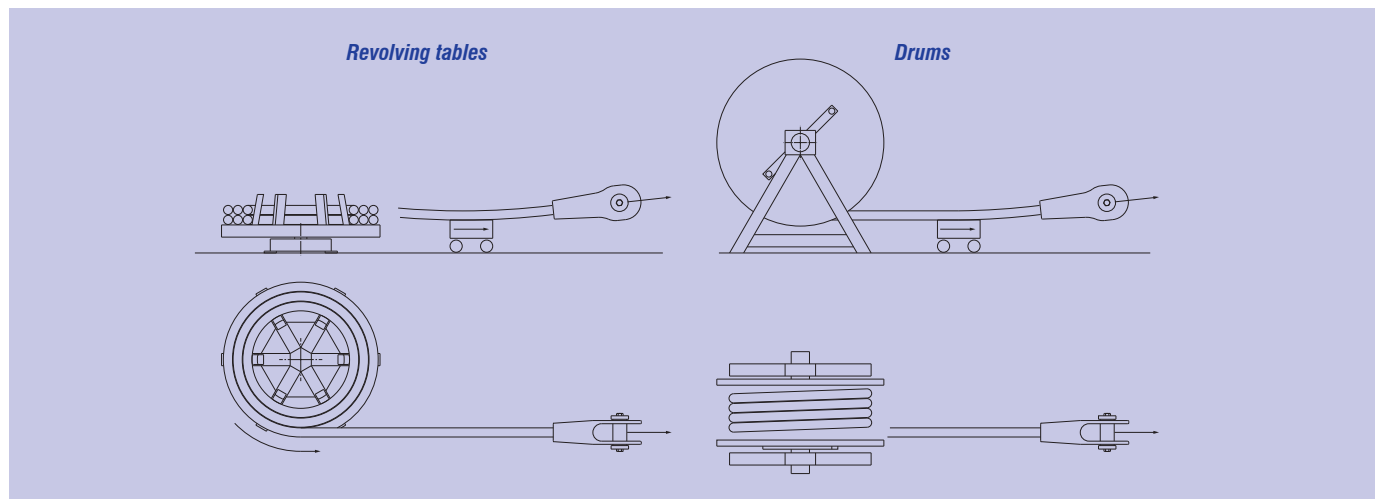
Wound cables must be kept dry after delivery on site!

An appropriate revolving table has to be used for unwinding the rings and an appropriate winding frame for unwinding the coilers.

The revolving tables or drums should be fitted with a braking device.

The following points must be observed when unwinding the cable tension members:

- Cable tension members must not be twisted (observe surface line!)
- Cable tension members must not be pulled over sharp edges.
- Cable tension members must not be buckled (cable tension members must be supported accordingly).
 Bending radius must not be less than $R = 15 \times$ rope diameter.
- Corrosion protection must not be damaged.



4. Removing packing materials

In order to avoid soiling, any provided packing materials on rope end fittings or applied clamps should only be removed just before installation.

5. Checking before installation

All cable tension members must be checked thoroughly for any transport damage before installation.

Particular attention must be paid to the following points in this respect:

- Damage to corrosion protection
- Damage to thread
- Damage to rope wires

Damaged corrosion protection has to be repaired immediately.

Damages on galvanized surfaces have to be treated with zinc dust paint (the concerning areas have to be decreased before).

If necessary an existing additional coating can be repaired afterwards.

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6. Preparation for installation

Any thread on cable connections must be cleaned thoroughly and greased prior to installation.

Damaged or dirty threads must not be assembled because this could lead to the tension member unfit for use.

In order to avoid damages on the threads, turnbuckles (for example Typ 984, 985, 864 and partly 804) will be delivered in “completely screwed in” condition (shortest length). Prior to installation these turnbuckles have to be adjusted to the “built in” length (usual middle position). The adjusting dimensions for the particular middle positions are shown in the respective catalogue sheets.

Note for cable tension members made of non-alloyed steel:

Any provided thread on hot-galvanised and spray-galvanised rope end fittings are generally untreated and only provided with temporary corrosion protection.

For this reason, any such thread must be degreased immediately after installation and provided with lasting corrosion protection.

7. Installation

Installation is generally carried out in compliance with an installation plan approved by a statics engineer / inspection engineer.

This plan must stipulate all important points for installation (e.g. installation process, order of installation, tensioning force).

Assignment to the correct installation position is to be ensured by marking all cable tension members.

Cable tension members must not be installed twisted. A surface line is generally marked on each cable tension members as a method of control. This line must not be twisted upon completion of elements.

Cable tension members are generally pulled into installation position using a suitable hoisting device (e.g. winch) or using a suitable lifting device (e.g. suspension bar, spreading bar). As described under no. 3, particular attention must be paid while doing so that there is no damage to the cable tension members. In particular, pay attention that the cable tension members is not buckled while lifting into place with suspension or spreading bars. In the case of heavy cable tension members, buckling of the cables at the suspension points can be prevented by using appropriate means; e.g. deflection saddles (deflection radius min. 15 x rope diameter).

Appropriate devices (hydraulic cylinders) must be used for the application of pre-tension force. Any provided thread may only be used for adjustments and not for the application of pre-tension forces.

Minimum screw-in depths of threads must be observed. The actual screw-in depths are to be recorded.

At screwed on nuts the minimum bolt overhangs according DIN 18800-7 / DIN EN 1090-2 have to be observed.

Threads on cable tension members must be secured against unwinding after adjustment (e.g. with locking nuts or gluing with bolt lock) unless otherwise specified. In particular bolts for security caps have to be glued. For bonding can suitable Loctite Threadlockers or similar products of other manufacturers to be used. It is essential that the processing instructions (pre-treatment of surfaces to be bonded) of the respective manufacturers are considered.

All seizing wires must be removed from the cable tension members after installation.

The seizing wires at the end of the ropes can stay in place during installation. They prevent individual wires from escaping from the rope binding if this is bent too much. The seizing wires must be removed after installation as otherwise it could have a negative effect on the corrosion protection.

Note for cables with inner filling:

Inner filling which is brought into the cables during stranding of the wires can escape to the surface when load has been handed over to the cable.

Maximum inclination of the cable connecting plates:

The maximum inclination of the cable connecting plates (deflection angle to the cable axis) must not be more than 1°.

A “bird caging” (loosening of the outer wire layer) can appear on very short and unstressed cables with swaged end terminations. Normally the outer wire layer will be closed again after stressing of the cable. A small bird caging in the unstressed cable condition has no interference of the carrying capacity of the cable tension member.

8. Supervision of rope operating equipment

Rope operating equipment must be kept under supervision and checked at regular intervals.

If no specific regulations exist for a construction, this supervision and inspection can be carried out in compliance with DIN 1076 “Engineering construction works within the scope of roads and pathways”.