2X15 Anchorage

- In service structural strengthening
- Allows a high prestressing density
- High corrosion protection
- Covered by a CE marking

Monostrand loop tendons anchorage

Technical data sheet reference: FT En R II 1 2 2

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Introduction

Freyssinet has developed a specific anchorage for the active reinforcement of circular structures, the 2X15. These anchorages use post-tensioning (PT) cable loops to apply pressure on the structure being repaired. They are suitable for large range of structures types including chimneys, pipes, masonry, etc.

Description

Loops

Loops are composed of sheathed and greased unbonded strands (called monostrands) threaded into a High-Density Polyethylene (HDPE) general duct. The annular space in the duct is cement grouted.
Characteristics of the strands that can be used are as follows:

Diameter	Type	Designation	F_{pk}
Ø 15,2	T15	Standard strand	260kN
Ø 15,7	T15S	Super strand	279kN
Ø 15,2	T15C	Compact strand	300kN

The PT strands themselves are individually protected by grease and a HDPE extruded coating; the protection allows the strand to slide freely without being bonded to the structure.
Cement grout is injected into the duct before tensioning of the tendon so that the monostrand is perfectly embedded and the pressure applied on the concrete of the structure is uniformized. The strand itself is thus perfectly protected against corrosion by two barriers:
• the individual grease protection & HDPE sheath, to prevent the circulation of humidity,
• the HDPE outer duct, filled with cement grout.
For applications in a highly aggressive environment, the loops can be protected against mechanical or thermal aggression by being embedded with shotcrete.

• Anchorage

The body of the anchorage is made of ductile cast iron that bears on the structure being reinforced. It ensures the following functions:
• Cylindrical-conical holes & conical jaws (composed of three wedges) in which the strands are anchored,
• Guiding of the monostrand from the duct to the anchorage,
• Connection between the general duct and the monostrand, using HDPE parts including fittings for the cement grout injection tube,
• Corrosion protection of the jaws and their environment by grease through a HDPE cap and a greaser screwed onto the anchorage for the operation.

Performance

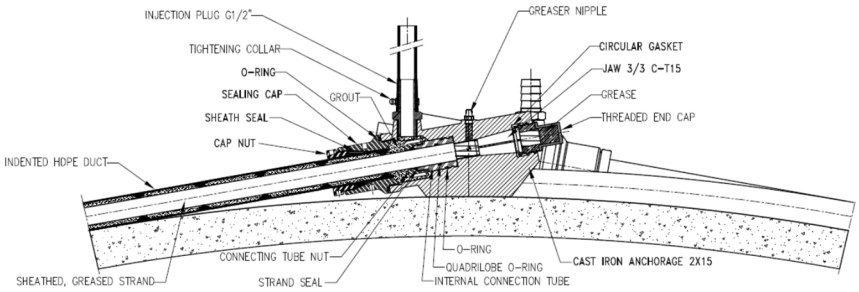
The 2X15 anchorage has successfully passed the static and dynamic tests specified by the European assessment document of the post-tensioning kits for prestressing of structures – EAD 160004-00-0031 (formally ETAG 013).
The 2X15 anchorage is covered by the European Technical Assessment ETA 06/0226 and associated CE marking.

• Diameter of the structure

The 2X15 anchorage is suitable to the diameter range comprises between 3,7m et 5,5m.

NOTA: It is also possible to use 2X15 anchorage on various other structure diameters after case study. For example, the anchorage can be used on a 7,5m diameter by positioning a 20mm thick shim under it.

• 2X15 Anchorage



2X15 Anchorage

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• If the anchorage is used in an aggressive environment and not protected by shotcrete, it is possible to protect the outside of the anchorage by means of a Rilsan coating.

The 2X15 anchorage is suitable for structures requiring a high prestressing density and loops spaced very closely.
It has a patented innovative design. Strands enter the cylindrical-conical orifices and can do each two complete loops around the structure. It provides high capacity of prestressing due to very small spacing between the cylindrical-conical holes.

The 2 X 15 anchorage can be used to anchor:
• two loops (one complete turn of each loop around the structure),
• two double loops (two complete turns of each loop around the structure). The 2X15 anchorage has two recesses located in the bearing zone, so that the anchored strand can make a complete loop around the structure, pass under the anchorage and then make a second loop before being anchored (see drawing).
This unique feature on the market makes the 2X15 anchorage exceptionally efficient and competitive.

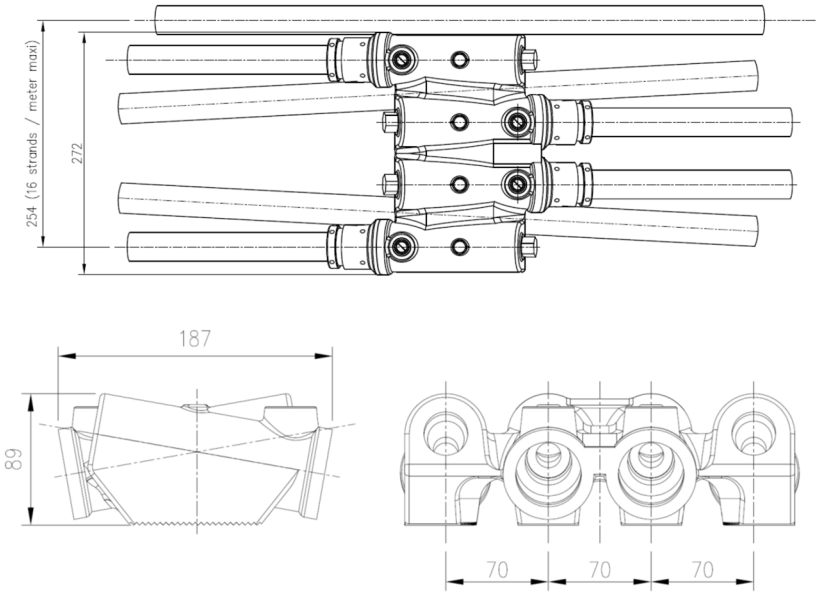
Installation

• Installation of monostrand and anchorage
The usual installation method consists in prefabricating the cables loops. The monostrands are cut to length and then inserted into the HDPE duct. The loops are then placed onto supports that have been previously fitted around the structure.
After preparation of the anchorage, the strands are inserted into the orifices and anchored using wedges. After insertion, the loop must be tightened to its final position and have perfect contact with the structure.

• Ducts injection
Injection fittings and vents are positioned onto the anchorage.
Cement grout injection is then proceeded into the annular space between the general duct and the monostrand.
Small cement grout volume is injected in each tendon. The operation can be done on several loops simultaneously.

• Tensioning
When the grout has reached the relevant compressive strength, the loops are tensioned using monostrand jacks adapted to the anchorage.

• Final protection of the anchorage zones
Anchorage zones are protected by filling the anchorage body with grease.
After cutting of the overlengths, the remaining strand ends are protected by grease and a special HDPE cap as mentioned above.
Additional protection can be provided by locating the anchorage in a recess and filling it with concrete, or embedded in a continuous rib.



Distance between strands and anchorage overall dimensions

Minimum spacing between two anchorages is of 254mm by disposing them in two rows, corresponding to 16 strands / ml.

Reinforcement of a buried pipeline

Local commercial contact