



EUROPEAN ASSESSMENT DOCUMENT

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SPIRAL CABLE ANCHOR

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1. SCOPE OF THE EAD

1.1 Description of the construction product

This EAD covers spiral cable anchor (Figure 1) with single or multi sleeve tubes for anchoring structures (e.g. systems for natural hazard protection) to the subsurface is made of spiral cable. The spiral cable wires are non-ferrous metallic coated (Zn or Zn/Al alloy) according to EN 10 264-2. The connection point above the surface is additionally covered by a single (Figure 1) or multi sleeve (Figure 2) tube to protect the anchor against degradation. The bushing is a non-structural component of anchor formed from steel strip.

Single or multi sleeve tube is made of structural circular hollow section according to EN 10210-1 and -2 and hot dip galvanized according to EN ISO 1461.

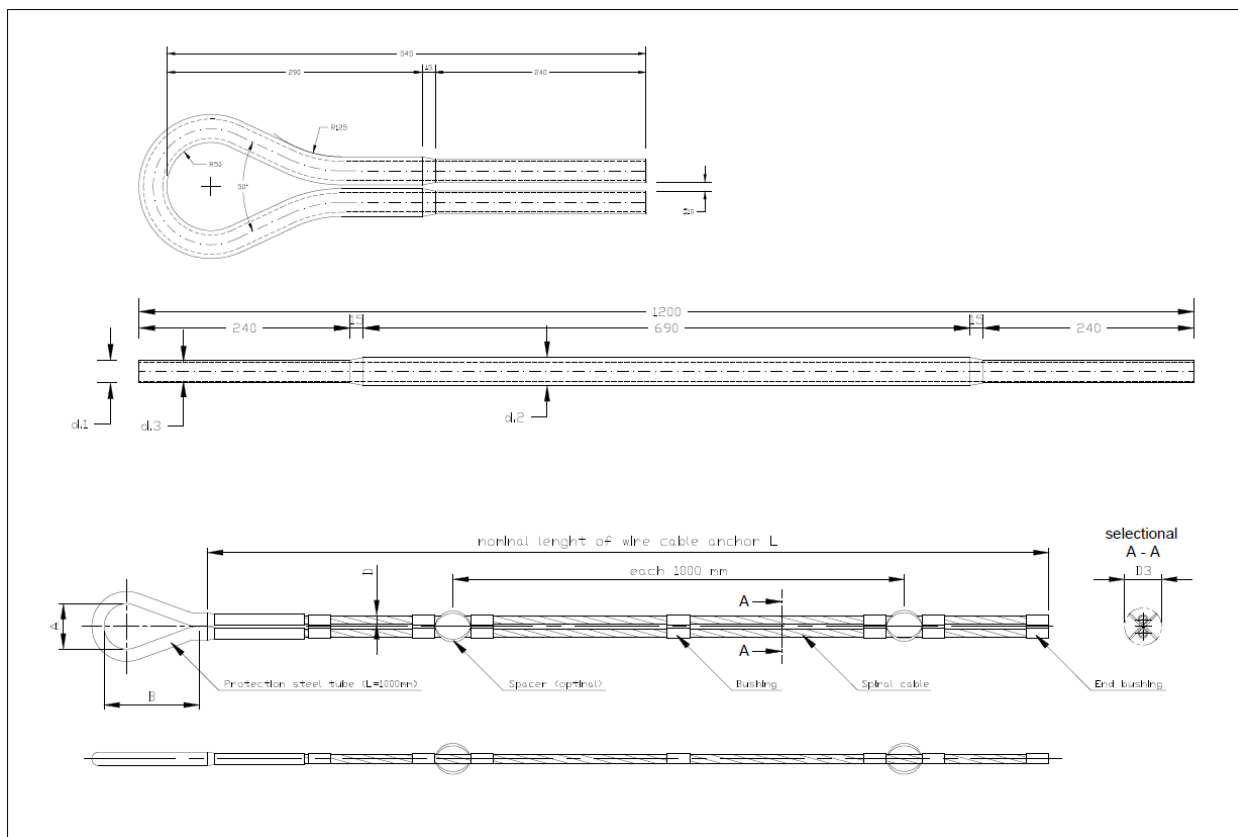


Figure 1 – Spiral cable anchor with single sleeve

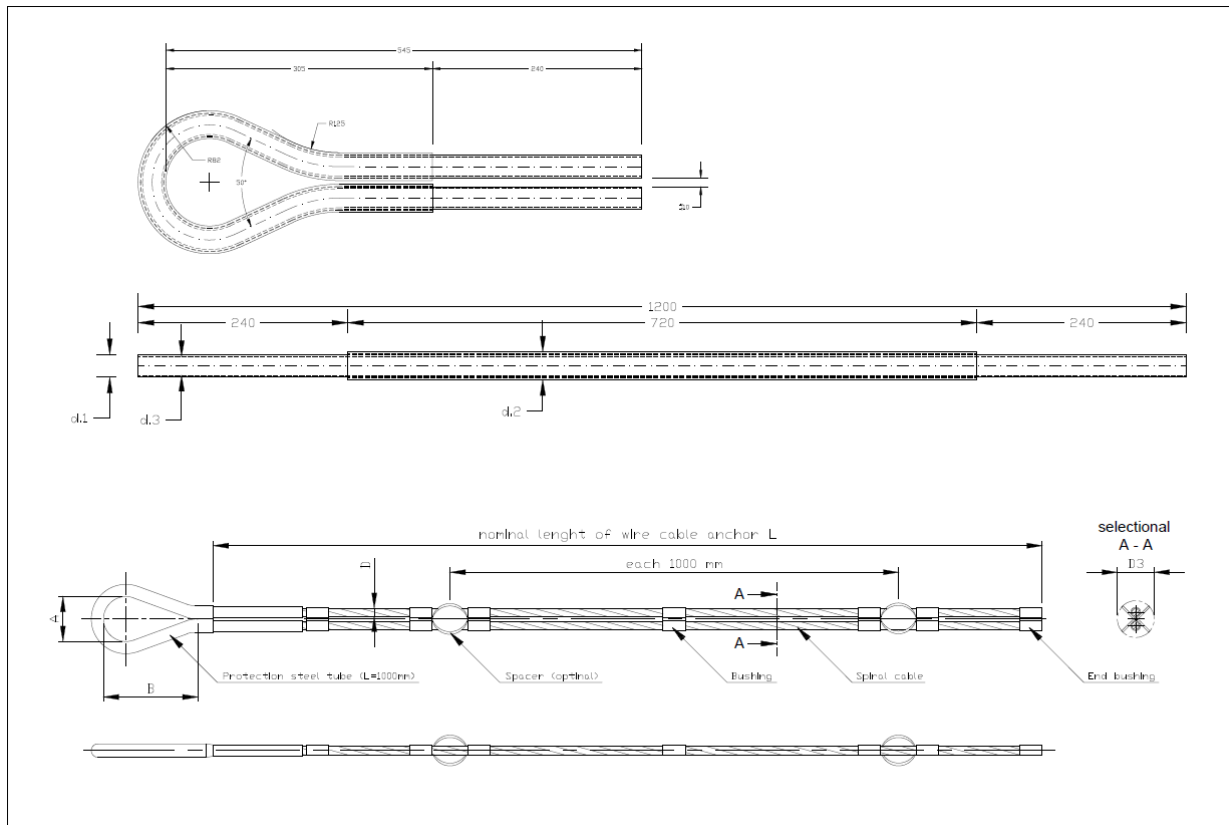


Figure 2 – Spiral cable anchor with multi sleeve

The product is not covered by a harmonised European standard (hEN).

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions. These instructions shall contain recommendation for design about appropriate use and assessment of product regarding aggressiveness of environment in which the work is to be executed.

Relevant manufacturer's stipulations having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

Spiral cable anchors with single or multi sleeve tubes are intended to be used for anchoring structures (e.g. systems for natural hazard protection) to the subsurface.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of wire ring connection components for the intended use of 25 years when installed in the works provided that the wire ring connection component is subject to appropriate installation. These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works¹.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1.3 Specific terms used in this EAD

1.3.1 Spiral cable

Cable (rope) according to standard EN 12385-10.

1.3.2 Bushing

To keep the spiral cables in position.

1.3.3 Sleeve tube

To protect the spiral cable anchor against degradation (mostly corrosion) above the ground surface.

¹ The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2. ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 1 shows how the performance of spiral cable anchor is assessed in relation to the essential characteristics.

Table 1 – Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)
Basic Works Requirement 1: Mechanical resistance and stability			
1	Tensile force of spiral cable anchor including bushing	2.2.1	F_{min} (kN)
2	Durability	2.2.2	description

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

2.2.1 Tensile force of spiral cable anchor including bushing

Tensile force of spiral cable anchor rope including bushing is defined as the minimum breaking force F_{min} (kN) from at least 3 tests according to Annex A. Force F_{min} (kN) shall be given in ETA.

2.2.2 Durability

The durability is assessed, for component thereafter according to standards relevant for given type of corrosion protection, as follows:

- Bushing: hot dip galvanized according to EN ISO 1461;
- Sleeve tube: hot dip galvanized according to EN ISO 1461;
- Ropes (cables) with Zinc and Zinc/Aluminium coated of class A or B according to EN 10264-2.

Type and thickness/mass of coating shall be expressed in ETA.

3. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is: Decision [1996/582/EC].

The system is: 1

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 2.

Table 2 – Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC)					
Manufacturer`s production					
1	Product: Tensile force of spiral cable anchor including bushing	2.2.1	F_{min} according to manufacturer`s technical file For all test results F_{FPC} $F_{min} \leq F_{FPC}$	3 samples / type	1 / year
Factory production control (FPC)					
Incoming product					
2	Bushing: Dimensions, steel grade, hot dip galvanization	Manufacturer`s technical file	Manufacturer`s technical file	Manufacturer`s technical file	Every shipment
3	Spiral cable: Designation Breaking force Coating type and mass	EN 12385-10 EN 12385-10 EN 10264-2		Inspection certificate of supplier, type 3.1 (or 2.2) EN 10204 In addition: Tests on mass of coating on cable wire 1 / diameter	Every shipment 3 / year
4	Sleeve tube: circular hollow section hot dip galvanization dimensions	EN 10210-1;-2 EN ISO 1461 Manufacturer`s technical file		Inspection certificate of supplier, type 3.1 EN 10204 1 / type	Every shipment Every shipment

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance for wire ring connection components are laid down in Table 3.

Table 3 – Control plan for the notified body; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
(1)	(2)	(3)	(4)	(5)	(6)
Initial inspection of the manufacturing plant and of factory production control					
1	Ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing of the spiral cable anchors.	-	Laid down in control plan	-	1
Continuing surveillance, assessment and evaluation of factory production control					
2	Verifying that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan.	-	Laid down in control plan	-	1/year

4. REFERENCE DOCUMENTS

As far as no edition date is given in the list of standards thereafter, the standard in its current version at the time of issuing the European Technical Assessment is of relevance.

EN 10204	Metallic products. Types of inspection documents
EN 10264-1	Steel wire and wire products - Steel wire for ropes - Part 1: General requirements
EN 10264-2	Steel wire and wire products - Steel wire for ropes - Part 2: Cold drawn non alloy steel wire for ropes for general applications
EN 12385-10	Steel wire ropes. Safety. Part 10 : Spiral ropes for general structural applications
EN 10210-1	Hot finished structural hollow sections of non-alloy and fine grain steels. Part 1: Technical delivery requirements
EN 10210-2	Hot finished structural hollow sections of non-alloy and fine grain steels. Part 2: Tolerances, dimensions and sectional properties
EN 13411-4	Terminations for steel wire ropes. Safety. Part 4: Metal and resin socketing
EN ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods
EN ISO 7500-1	Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system

ANNEX A – TENSILE FORCE OF SPIRAL CABLE ANCHOR INCLUDING BUSHING

A.1 Scope

The aim of this test is to define the tensile force of spiral cable anchor as the minimum breaking force in tension.

A.2 Test Specimen

The test specimen is the spiral cable anchor as a whole according to Figure 1. The open end has to be terminated with metal socket according to Figure 1 (adopted for two cables) in EN 13411-4+A1. The preparation of ends of two spiral cables and of socket shall be carried out according to cl. 5.2 in EN 13411-4+A1. The pouring procedure shall follow cl. 5.3.3 in EN 13411-4+A1. The termination shall be capable to transfer the breaking force of cables without any wire pulling out or cable breaking at the base of the socket.

The test has to be done in a tensile-machine with a bolt of $\varnothing 100\text{mm}$.

A.3 Test equipment

The traction machine shall be in accordance with the requirements of EN ISO 7500-1 and shall be at least of Class 1.

A.4 Test Conditions

A.4.1 Method of sample fixing

The connecting bolt to test sample shall be of diameter $\varnothing 100\text{ mm}$, see Figure A.1.

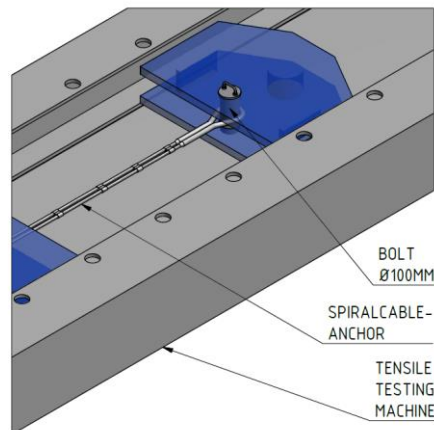


Figure A.1- Spiral cable anchor connection to tensile test machine (at termination)

A.4.2 Test procedure

The sample after placing in test equipment shall be tested according to cl. 6.4.1.2 and Annex B3.3 in EN 12385-1+A1. The testing apparatus shall be able to record the elongation – force diagram.

A.4.3 Number of samples

For determination of the characteristic resistance to opening at least 3 samples for each type of wire ring connection component shall be tested.

A.4.4 Determination of tensile force

The test shall be carried out to the rupture of sample and the elongation – force diagram shall be recorded. The tensile force is the force at rupture. The sample rupture in termination is not acceptable.

A.5 Test report

The test report shall include at least the following information:

- Name of the laboratory and the name of the operator who performed the tests;
- The characteristics of the testing machine and its calibration certificate;
- Identification of the tested sample (type of spiral anchor cable, diameter and designation of rope, breaking force of rope (according to inspection document), end termination description, etc.);
- The date of test and results (breaking forces F_i ($i = 1$ to 3), elongation – force diagrams and description of rupture with photo documentation).