

European Technical Assessment

ETA-08/0035
of 02.06.2023

General Part

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| Technical Assessment Body issuing the European Technical Assessment | SINTEF AS by its institute SINTEF Community |
| Trade name of the construction product | HRC 100 Series T-headed bars |
| Product family to which the construction product belongs | Headed reinforcement steel bars |
| Manufacturer | HRC Europe Lierstranda 107 NO-3412 Lierstranda Norway |
| Manufacturing plant(s) | HRC Europe manufacturing plants |
| This European Technical Assessment contains | 7 pages including 3 Annexes which form an integral part of this assessment |
| This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of | EAD 160012-00-0301 Headed reinforcement steel bars |
| This version replaces | ETA-08/0035, issued on 2022-06-07 |

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

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1. Technical description of the product

HRC 100 Series T-headed bars are steel bars for reinforcement of concrete structures. The bars have devices for mechanical anchorage attached to one or both ends. The anchorage devices (T-heads) are steel plates rigidly connected to the rebar. For HRC 110, HRC 120 and HRC 150, the T-head plates are connected to the bar by friction welding. The friction welding between the reinforcement bar and the T-head plate complies with EN ISO 15620: 2000. For HRC 170 the T-head plates are connected via threads for assembly after installation of the bar.

The reinforcement bar material complies to EN 10080: 2005 and EN 1992-1-1: 2004 with 500 MPa characteristic yield strength and ductility class B or C.

Nominal bar diameter is in the range of 16 mm to 40 mm. Nominal anchoring plate thickness is in the range of 12 mm to 25 mm. A description of the product is given in Annex A.

2. Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The performances given in Section 3 are only valid if the T-headed bar is used in compliance with the specifications and conditions given in Annex A and B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life at the T-headed bars of at least 100 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

| Essential characteristic | Performance |
|---|-------------|
| Characteristic resistance under static and quasi-static loading | See Annex C |
| Characteristic resistance under seismic loading | See Annex C |

3.2 Safety in case of fire (BWR 2)

| Essential characteristic | Performance |
|--------------------------|---|
| Reaction to fire | Class A1, acc. to EN 13501-1: 2007 + A1: 2009 |
| Resistance to fire | See Annex C |

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

In accordance with European Assessment Document EAD No. 160012-00-0301, the applicable European legal act is 96/582/EC. The system to be applied is: 1+

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at SINTEF.

Issued in Oslo on 02.06.2023

By

SINTEF

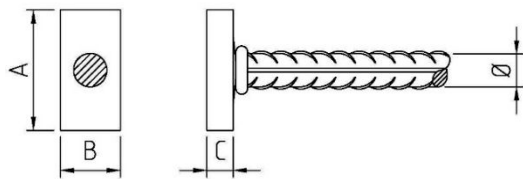


Anne-Jorunn Enstad

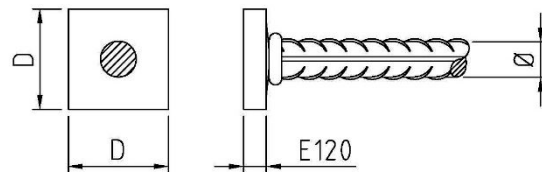
Certification manager

ANNEX A – PRODUCT DESCRIPTION

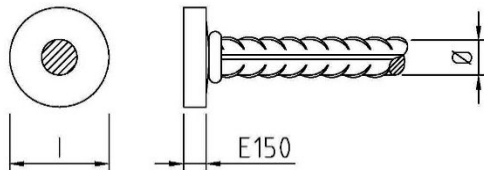
A.1 Dimensions



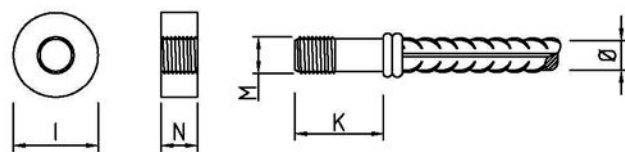
HRC 110 T-Head



HRC 120 T-Head



HRC 150 T-Head



HRC 170 T-Head

Table A.1 - Dimensions

| Nominal diameter of reinforcing bar | Head Dimensions ¹ | | | | | | | | | |
|--|------------------------------|-----------|-----------|-----------|--------------|--------------|-----------|-----------|-----------|-----------|
| | A (mm) | B (mm) | C (mm) | D (mm) | E120 (mm) | E150 (mm) | I (mm) | K (mm) | M (mm) | N (mm) |
| 12 | - | - | - | - | - | 10 | 38 | - | - | - |
| 16 | 60 | 35 | 14 | 50 | 12 | 12 | 50 | - | - | - |
| 20 | 80 | 40 | 18 | 60 | 14 | 16 | 65 | 70 | M24 | 25 |
| 25 | 100 | 50 | 20 | 70 | 16 | 20 | 80 | - | - | - |
| 32 | 120 | 65 | 25 | 90 | 20 | 25 | 100 | - | - | - |
| 40 | - | - | - | 110 | 25 | - | - | - | - | - |

¹ Given head dimensions are to be regarded as minimum sizes. The use of larger T-head plates may be preferable in special situations.

Table A.2 - Materials

| Component | Material |
|------------------------------|--|
| Rebar | Reinforcing bars of class B or C acc. to EN 1992-1-1: 2004 + AC: 2010, with $f_{yk} = 500$ MPa |
| Head plate and threaded bolt | 1.0590; 1.8901; 1.8907 |

ANNEX B – INTENDED USE

B.1 Specification of intended use

Anchorage of reinforcing steel bars for concrete structures subject to:

- Static and quasi-static loading (HRC 110, HRC 120, HRC 150 and HRC 170)
- Seismic loading (HRC 110, HRC 120 and HRC 150)

B.2 Concrete

Concrete of minimum strength class C30/37, acc. to EN 206: 2013.

B.3 Design

HRC 100 Series T-headed bars are part of the reinforcement for a concrete structure, based on the structural design for the works according to applicable design standards. Necessary bursting and spalling reinforcement, due to partially loaded areas, local crushing and transverse tension forces shall be considered.

To ensure the resistance to fire, the structure has to be designed and constructed according to the provisions of an appropriate standard for structural fire design.

B.4 Installation

HRC 100 Series T-headed bars shall be installed in accordance with detailed construction documentation, like drawings, models, specifications etc., established for the individual works.

The T-head and the head-to-bar connection shall not be machined or otherwise modified.

Bending of HRC 100 Series T-headed bars shall be carried out such that the start of the bend is at least in a distance of 2 x nominal bar diameter from the head-to-bar connection.

HRC 170 T-heads are to be installed by screwing them firmly onto the threaded bolt.

ANNEX C – PERFORMANCE

C.1 Anchorage capacity under static and quasi-static loading

Table C.1 – Capacity under static and quasi-static loading

| Product | Level of performance | Description |
|--|---------------------------------------|--|
| HRC 110 \varnothing 16 to \varnothing 32 HRC 120 \varnothing 16 to \varnothing 40 HRC 150 \varnothing 12 to \varnothing 32 HRC 170 \varnothing 20 | Category B3 acc. to ISO 15698-1: 2012 | Requirements acc. to clause 7.2.2 in ISO 15698-1: 2012 are fulfilled: <ul style="list-style-type: none">• Failure occurs in the rebar outside the affected zone.• The minimum specified elongation for the rebar is reached.• Tensile strength of at least 95% of the actual tensile strength of the rebar is reached. |

C.2 Anchorage capacity under seismic loading

Table C.2 – Capacity under seismic loading

| Product | Level of performance | Description |
|--|--------------------------------------|--|
| HRC 110 \varnothing 16 to \varnothing 32 HRC 120 \varnothing 16 to \varnothing 32 HRC 150 \varnothing 16 to \varnothing 32 | Category S acc. to ISO 15698-1: 2012 | Sustained loading program acc. to clause 7.2.4 in ISO 15698-1: 2012, without failure |

C.3 Resistance to fire

HRC 100 Series T-headed bars are part of the reinforcement for a concrete structure, based on the structural design for the works according to applicable design standards. To ensure the resistance to fire, the structure has to be designed and constructed according to the provisions of an appropriate standard for structure.