

## European Technical Approval ETA-13/0244

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung  
*Trade name*

Schraubengarnituren mit TCB Stud  
*Bolting assemblies with TCB Stud*

Zulassungsinhaber  
*Holder of approval*

Tension Control Bolts Ltd.  
Whitchurch Business Park  
Shakespeare Way  
SHROPSHIRE SY 13 1LJ  
GROSSBRITANNIEN

Zulassungsgegenstand  
und Verwendungszweck  
*Generic type and use  
of construction product*

Schraubengarnituren mit TCB Stud  
*Bolting assemblies with TCB Stud*

Geltungsdauer:  
*Validity:* vom  
*from*  
bis  
*to*

30 May 2013  
30 May 2018

Herstellwerk  
*Manufacturing plant*

Tension Control Bolts Ltd  
Whitchurch Business Park  
Shakespeare Way  
Whitchurch  
Shropshire  
SY13 1LJ  
United Kingdom

Diese Zulassung umfasst  
*This Approval contains*

8 Seiten einschließlich 1 Anhang  
*8 pages including 1 annex*

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products<sup>1</sup>, modified by Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by Article 2 of the law of 8 November 2011<sup>5</sup>;*
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

<sup>1</sup> Official Journal of the European Communities L 40, 11 February 1989, p. 12  
<sup>2</sup> Official Journal of the European Communities L 220, 30 August 1993, p. 1  
<sup>3</sup> Official Journal of the European Union L 284, 31 October 2003, p. 25  
<sup>4</sup> *Bundesgesetzblatt Teil I* 1998, p. 812  
<sup>5</sup> *Bundesgesetzblatt Teil I* 2011, p. 2178  
<sup>6</sup> Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product/ products and intended use

#### 1.1 Definition of the construction product

The bolting assemblies with TCB studs are high-strength bolting assemblies of the nominal sizes M12 to M36 consisting of a stud with two threaded ends and a shear spline at one end, two nuts and one or two washers or one nut and one washer for the use in tapped blind holes. The thread opposite the spline is left-hand thread. The geometry of the stud is, except for the non existing head, similar to the HRC bolts according to EN 14399-10:2009. The shear wrench for the installation process is the same as for the bolting assemblies according to EN 14399-10:2009.

The left hand nut can be a nut according to EN 14399-10:2009 or a special geometry nut with a knurled collar (s. c. press-nut).

Samples for high-strength stud and nut assemblies for preloading with standard nut and press-nut are shown in Annex 1.

#### 1.2 Intended use of the construction product

The product is intended to be used for preloaded bolting connections of structural steel parts. The advantage of the studs is the use in tapped blind holes and for difficult assessable connections where bolts with heads can not be installed. The press-nut is intended to be used for preassembling. Therefore, it is pressed with the knurled collar in a tight hole in the structural part. The stud will than be screwed-in during the erection.

The provisions made in this European technical approval are based on an assumed working life of the bolting assemblies with TCB studs of 25 years when installed in the works or as long as the assumed working life of the structure where the bolting assembly is installed, a sufficient protected against corrosion provided. 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.

### 2 Characteristics of product and methods of verification

#### 2.1 Characteristics of product

The bolting assemblies with TCB studs shall correspond to the drawing given in Annex 1.

The characteristic material values, dimensions and tolerances of the bolting assemblies with TCB studs either indicated in this section or in Annex 1 shall correspond to the respective values laid down in the technical documentation<sup>7</sup> to this European technical approval.

The values of preload forces of the connections made with the bolting assemblies with TCB studs are given in section 4.2.

<sup>7</sup> The technical documentation to this European technical approval is deposited at Deutsches Institut für Bautechnik and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure is handed over to the approved bodies.

The bolting assemblies with TCB studs are considered to satisfy the requirements of performance class A1 of the characteristic reaction to fire.

## 2.2 Methods of verification

The assessment of the fitness of the bolting assemblies with TCB studs for the intended use in relation to the Essential Requirements ER 1 (Mechanical resistance and stability), ER 2 (Safety in case of fire), ER 3 (Hygiene, health and environment) and additional aspects of durability has been made in accordance with section 3.2 of the Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>.

The assessment of the resistance to fire performance is only relevant to the assembled system (Bolting assemblies with TCB studs, steel structure) which is not part of the ETA.

The bolting assemblies with TCB studs are considered to satisfy the requirements of performance class A 1 of the characteristic reaction to fire, in accordance with the provisions of the EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that decision.

Concerning Essential Requirements No. 1 (Mechanical resistance and stability) the following applies:

The values of preload forces given in Table 1 were determined by tests.

Concerning Essential Requirement No. 3 (Hygiene, health and environment) the following applies:

The bolting assemblies with TCB studs do not contain dangerous substances or radiation.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to the Decision 99/92/EC of the European Commission<sup>8</sup> system 2+ of the attestation of conformity applies.

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

- (1) initial type-testing of the product;
- (2) factory production control;
- (3) testing of samples taken at the factory in accordance with a prescribed test plan.

(b) Tasks for the approved body:

- (4) certification of factory production control on the basis of:
  - initial inspection of factory and of factory production control;
  - continuous surveillance, assessment and approval of factory production control.

<sup>8</sup>

Official Journal of the European Communities L 80 of 18.03.1998

– Note: Approved bodies are also referred to as "notified bodies".

### 3.2 Responsibilities

#### 3.2.1 Tasks for the manufacturer

##### 3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.<sup>9</sup>

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

##### 3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of mechanical connections in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

#### 3.2.2 Tasks for the approved bodies

The approved body shall perform the

- initial inspection of factory and of factory production control,
  - continuous surveillance, assessment and approval of factory production control
- in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in written reports.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

### 3.3 CE marking

The CE marking shall be affixed on the accompanying commercial documents. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate for the factory production control,

<sup>9</sup> The control plan is a confidential part of the European technical approval and only handed over to the approved bodies involved in the procedure of attestation of conformity. See section 3.2.2.

- the number of the European technical approval,
- the name of the product.

#### 4 Assumptions under which the fitness of the product for the intended use was favourably assessed

##### 4.1 Manufacturing

The bolting assemblies with TCB studs are manufactured in accordance with the provisions of the European technical approval using the manufacturing process as laid down in the technical documentation.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

##### 4.2 Design

###### 4.2.1 General

Bolting assemblies with TCB studs completely or partly exposed to external weather or similar conditions are protected sufficiently against corrosion. For the corrosion protection the rules given in EN 1090-2:2008 are taken into account.

Bolted connections in steel structure with Bolting assemblies with TCB studs are designed according to EN 1993-1-8:2005 + AC:2009 as far as no other provisions are made in the following.

###### 4.2.2 Specific

For calculation the increased design preload forces according Table 1 may be used.

**Table 1 Design preload forces**

Nominal size	Design preload force $F_{p,Cd}$ [kN]
M12	59,0
M16	110
M20	172
M22	212
M24	247
M27	321
M30	393
M36	572

#### 4.3 Installation

##### 4.3.1 General

Bolted connections in steel structure with bolting assemblies with TCB studs are executed according to EN 1090-2:2008+A1:2011, section 8.5.5 as far as no other provisions are made in the following.

##### 4.3.2 Specific

The installation of the Bolting assemblies with TCB studs is only carried out according to the provisions of the manufacturer with the appropriate shear wrench. The manufacturer hands over the assembly instruction to the executing company.

Connections with bolting assemblies with TCB studs are only executed by companies with the necessary experience unless the instruction of the assembly personnel is arranged by specialists experienced in this field.

The structural parts to be connected have direct contact. The bolt axis is rectangular to the surface of the structural part. Possible inclination is adequately adjusted by wedge washers.

#### 5 Indications to the manufacturer

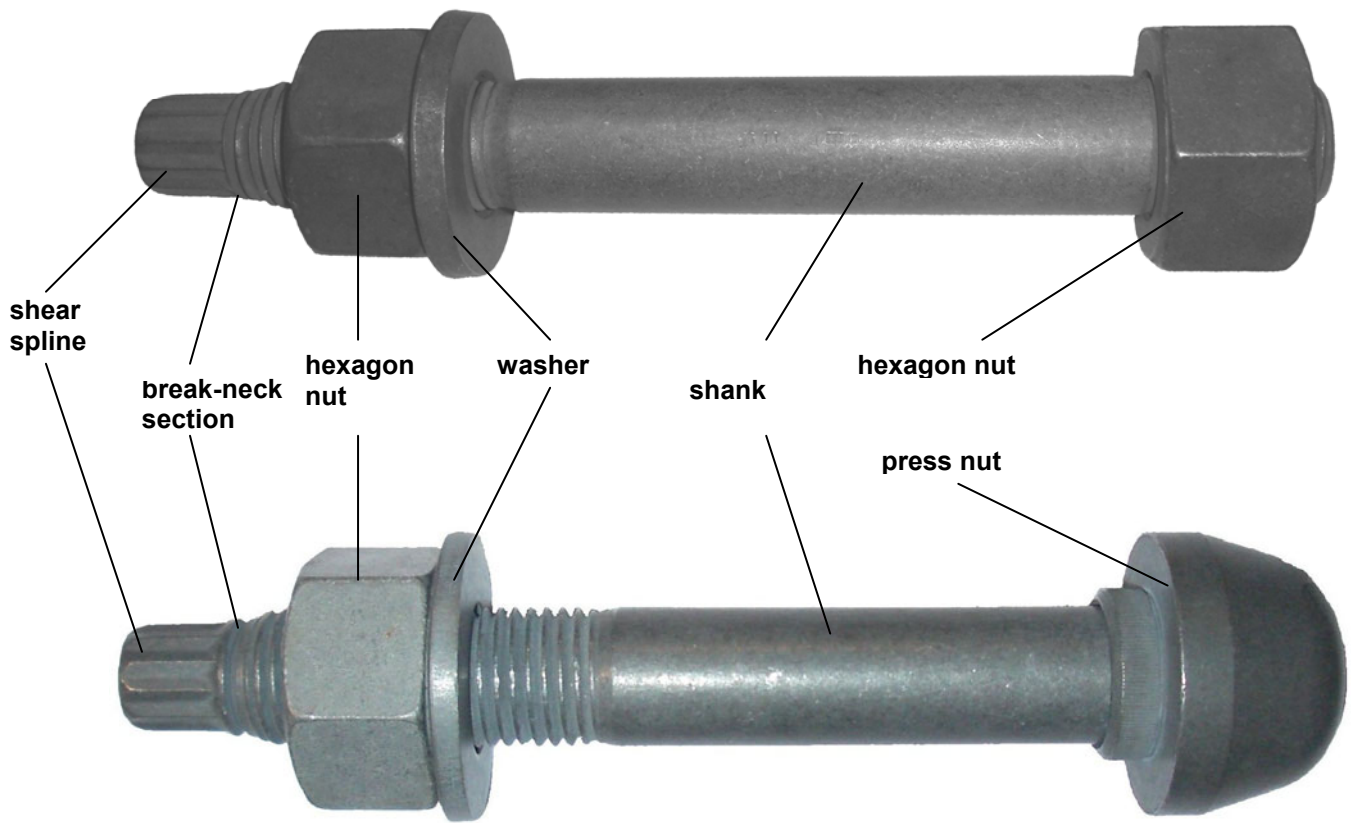
It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1, 2, 4.2 and 4.3 (including Annexes if referred to) is given to those who are concerned. This information may be given by reproduction of the respective parts of the European technical approval.

In addition all installation data (e. g. preload force) shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

Andreas Schult  
p. p. Head of Department

*beglaubigt:*  
Ulbrich

**Samples for TCB Studs**



**sheared off shear spline after installation**



Bolting assemblies with TCB Stud

Samples for Bolting assemblies with TCB Stud with hexagon nut or press nut

Annex 1