



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Mr. N. Anselmann  
DG Entreprise SC 15 2/147  
Rue de la Science 15  
1040 BRUSSELS

Ref: HP/CORR/132/ADC

2004-04-29

Subject: Amended answer to Mandate M/120

Dear Mr. Anselmann,

Please find herewith an amended answer of CEN/TC 185 "Threaded and non-threaded mechanical fasteners and accessories" to the mandate M/120 "Structural metallic products", for your acceptance.

The original answer of CEN/TC 185 was sent to the Commission Services by our letter referenced EC Mandates/1876 dated 2000-07-20 and accepted by the Commission Services by letter referenced 08707 dated 13-07-01.

Due to the urgency in having the Commission Services acceptance of this amended answer, CMC had already submitted the answer by e-mail dated 23<sup>rd</sup> January 2004 (copy attached).

As agreed with the Commission Services, you will also find attached the comments of Mr. Stephen Rein, Consultant, on the answer of CEN/TC 185.

Yours sincerely,

Hugues Plissart  
Director  
Standards Development

c.c. Mr. Reinhard Klein  
Mrs. C. Vanden Schrieck

*Stephen J Rein* M.C.I.O.B., M.Inst.C.E.S.

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29 April 2004

Amilcar DaCosta  
Project Manager  
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Rue de Stassart, 36,  
B-1050 BRUXELLES  
BELGIUM

Dear Amilcar

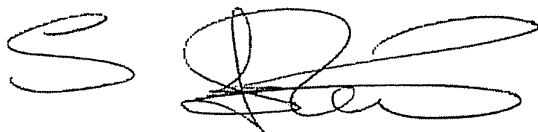
**Amended response to Mandate M/120 - CEN/TC 185 N 119**

Further to the penultimate paragraph in my letter to you dated 29<sup>th</sup> February, I can confirm that the TC has confirmed page 10 B.1.1 (iv) final indent as a typing error.

It is confirmed that it should read - *tensile strength of the bolt/nut assembly (!)*

Read in conjunction with my letter of the 29<sup>th</sup> this amended response satisfies the requirements of the mandate.

Kind regards,  
Yours sincerely

A handwritten signature in black ink, appearing to be 'S J Rein', with a large, stylized 'S' at the beginning and a complex, looping signature for 'J Rein'.

Cc Dr. Hellwig - TC 185

*Stephen J Rein M.C.I.O.B., M.Inst.C.E.S.*

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29 February 2004

Amilcar DaCosta  
Project Manager  
CEN  
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B-1050 BRUXELLES  
BELGIUM

Dear Amilcar

**Amended response to Mandate M/120 - CEN/TC 185 N 119**

I attach a copy of the above document (revised January 2004) being an amended response from TC 185 to their original dated 28<sup>th</sup> October 1999.

The amendment reflects the TC's view of an improved way to present hENs for structural bolt connectors in the light of experience gained during the development of the standards and does not substantially change the technical content of the original response. The other issue is revision of the target dates, for which the TC includes an explanation .

Comments from Dr Pinney dated 29<sup>th</sup> December 1999 concerning non-mandated characteristics remain valid but unless confirmed as acceptable these characteristics may not be part of CE marking. Urgent advice for this is requested from the Commission as the standards are now almost ready to go to FV.

I would only draw the TC's attention to page 10 B.1.1 (iv) final indent which appears to be a typing error since this standard deals with non-preloaded bolts and hence I would assume this characteristic to be not relevant in this case. If I am correct, this should be amended prior to submission as the final document.

Taking into consideration the above, this amended response satisfies the requirements of the mandate.

Kind regards,  
Yours sincerely

A handwritten signature in black ink, appearing to be 'S J Rein', with a stylized flourish at the end.

Cc Dr. Hellwig - TC 185

**Mandate M/120 Structural metallic products and ancillaries**

**Answer from CEN/TC 185 Threaded and non-threaded mechanical fasteners and accessories (Revised January 2004)**

**Introduction**

The present answer from CEN/TC 185 has been modified as against the answer which was submitted in 2000 as follows:

Originally it was proposed to elaborate 4 harmonized product standards for high strength structural bolting for preloading. Then CEN/TC 185 decided that it would be more appropriate to combine all requirements, which are essential in connection with mandate M/120, in one harmonized standard (prEN 14399-1) with the title "General requirements". In this harmonized standard reference will be taken to the four product standards (prEN 14399-3 to prEN 14399-6) which are now supporting standards and give examples of products which fulfil the requirements of the harmonized part. This solution will offer the possibility to extend the list of products for high strength structural bolting for preloading by adding further supporting product standards if required.

The supporting standard for a suitability test for preloading (prEN 14399-2) was already proposed as a supporting standard in the former answer of CEN/TC 185, see A.1.1, point (iv).

Moreover, CEN/TC 185 took notice of the fact that mandate M/120 does not only cover fasteners for high strength structural bolting for preloading but also fasteners for non-preloaded structural bolting. This was already mentioned in the answer presented in 2000, see clause 0.4, but these types of fasteners were then called "Bolts, nuts and washers for general application in steel structures".

In the present answer CEN/TC 185 proposes to elaborate also a harmonized standard for "General requirements" for fasteners for non-preloaded structural bolting, similar to prEN 14399-1, and further a supporting standard for a suitability test for these products.

All these completions are covered in the present answer of CEN/TC 185 to the mandate M/120, which is divided into the main sections

A: High strength structural bolting for preloading

and

B: Non-preloaded structural bolting.

For more information on changes made as against the former answer, see Annex.

**Further explanations concerning the revised answer from CEN/TC 185**

**Target dates**

The discussion of the harmonized standard (prEN 14399-1) was made more difficult by the fact that in the European countries different technical solutions for high-strength structural bolting for preloading exist, which are incorporated in national regulations.

Moreover, additional discussion was necessary, since the basic requirements for design and execution of steel structures, which are laid down in EN 1993-1-1 (Eurocode 3) and in ENV 1090-1 and which influences the requirements for structural bolting, are at present under revision.

For these reasons, the target dates as given in the answer of 2000 had to be changed.

### **Characteristics mentioned in the mandate which should be deleted**

The reason why CEN/TC 185 proposes to delete some of the characteristics given in the mandate were specified more clearly, see A.1.1 (iv) and B.1.1 (iv).

## **0 General comments of CEN/TC 185 as to the answer to the mandate**

### **0.1 Request for clarification on the scope of the mandate concerning the products and allocation of work:**

CEN/TC 185 deals with structural connectors excluding such for railway applications which are also mentioned in the annexes 1 and 2 of the mandate.

### **0.2 Request for clarification on the intended use:**

It should be clarified that the products in the mandate are used in general building and civil engineering structures but not for railway tracks which may be derived from the specification "railway fasteners" in annex 1 of the mandate.

### **0.3 Information on products under the scope of the mandate which are the subject of other CEN/TCs — Information on the organization of the work between TCs:**

If fasteners for railway application remain in the scope of the mandate, they should be dealt with in

CEN/TC 256 Railway application

If fasteners for weld studs are included in the scope of the mandate, they should be dealt with in

CEN/TC 121 Welding

### **0.4 Information on issues concerning the scope and intended uses included in the mandate for which no work has yet been started in the TC, or for which the TC cannot provide a standard:**

CEN/TC 185 has not yet started the elaboration of standards for

- solid rivets
- studs and stud bolts

### **0.5 Specific requests for additions to the mandate of products, materials, intended uses, essential requirements etc.:**

None.

### **0.6 Liaison with other TCs for certain horizontal tests — Information on the organization of the work between the TCs:**

Probably a liaison with

CEN/TC 135 Execution of steel structures

is required in order to elaborate a procedure for a suitability test.

## **0.7 Other issues which the TC considers necessary for the comprehension of the answer to the mandate:**

The standards will include clauses on evaluation of conformity, which will include factory production control, make reference to the Commission Decision on the system of attestation and give guidance on CE marking.

### **A: High-strength structural bolting for preloading**

#### **A.1 High-strength structural bolting for preloading — Part 1: General requirements (prEN 14399-1)**

Availability: Stage 40: 2001-12  
 Stage 49: 2004-03  
 Availability: 2005-03

##### **A.1.1 Harmonized standard**

###### **(i) Title:**

High strength structural bolting for preloading — Part 1: General requirements

###### **(ii) Scope:**

This part of this European standard (prEN 14399-1) specifies the general requirements for the components of bolt/nut/washer(s) assemblies for high-strength structural bolting, which are suitable for preloading and for the assemblies themselves.

Examples for components which fulfil the requirements of this part of this European standard are specified in the standards prEN 14399-3, prEN 14399-4, prEN 14399-5 and prEN 14399-6. Further product standards serving as supporting standards are under preparation.

For clauses of this European standard addressing the provisions of the EU Construction Products Directive, see Annex ZA of Part 1.

###### **(iii) Intended use:**

Structural metallic works

###### **(iv) The essential characteristics according to the mandate which will be dealt with in the above standard will be:**

- Tolerances on dimensions and shape (bolts, nuts, washers)
- Elongation (bolts)
- Tensile strength (bolts)
- Tensile yield strength (bolts)
- Proof load (nuts, bolts) (!)
- Strength under wedge loading (bolts) (!)
- Impact strength (bolts)

- Hardness (bolts, nuts, washers)
- Shear strength: This is indirectly determined by determination of axial tensile strength.
- Friction coefficient: The specification of the friction coefficient is covered in the supporting standards by the specification of the *k*-factor of the assembly.
- Release of cadmium and its compounds (bolts, nuts, washers)
- Suitability of assembly for preloading (assemblies of bolts, nuts, washers) (!)

Note 1 All mechanical properties, except for washers, refer to property classes of bolts and nuts which are specified in EN ISO 898-1 and EN 20898-2 respectively.

Note 2 In order to avoid release of cadmium and its compounds, cadmium will not be allowed as a surface coating for bolts, nuts and washers.

The characteristics marked like this (!) are not covered by the mandate but are critical for the function of the fasteners and the assembly. They are major characteristics defined in EN ISO 898-1 and EN 20898-2.

The following characteristics which are mentioned in the mandate are, according to the opinion of CEN/TC 185, not relevant for bolts and nuts for high strength structural bolting and should be deleted from the mandate:

- Fatigue strength: Fatigue strength is a function of the bolted connection but not of the bolts or nuts and depends on the mechanical characteristics tensile strength, yield strength, permanent elongation after fracture and the tolerances on dimensions and on form and position. There are no known national standards specifying fatigue strength of bolts or nuts for structural bolting.
- Fracture toughness/brittle strength: These characteristics are not evaluated for fasteners, see however the characteristic impact strength as alternative.
- Bonding strength: This is only relevant for some types of anchor bolts, which are not included in the mandate.
- Mechanical strength: As mechanical strength values for bolts and nuts tensile strength, yield strength and stress under proof load will be specified.
- Stiffness: Since bolts are loaded in axial direction, the stiffness of a bolted assembly is specified by the Youngs modulus and by the nominal cross section of the bolt. There is no national or international standard for measuring or testing Youngs modulus of bolts.
- Weldability: Weldability is not relevant, since it is not permitted to weld high strength bolts and nuts for preloading.
- Emission of radioactivity: Fasteners are manufactured from engineering steels which will conform to relevant EN steel specifications. Therefore, the emission of radioactivity is not relevant to the EN standards for bolts and nuts.

**(v) Durability aspects:**

The harmonized standard will contain provisions for surface coatings to improve corrosion resistance.

**(iv) Other aspects:**

None

### A.1.2 Supporting standards

The following standard are proposed as supporting standards:

#### Dimensions, tolerances, mechanical properties and testing

prEN 10204, *Metallic products — Types of inspection documents*.

prEN 14399-2, *High-strength structural bolting for preloading — Part 2: Suitability test for preloading*.

prEN 14399-3, *High-strength structural bolting for preloading — Part 3: System HR — Hexagon bolt and nut assemblies*.

prEN 14399-4, *High-strength structural bolting for preloading — Part 4: System HV — Hexagon bolt and nut assemblies*.

prEN 14399-5, *High-strength structural bolting for preloading — Part 5: Plain washers*.

prEN 14399-6, *High-strength structural bolting for preloading — Part 6: Plain chamfered washers*.

EN 20898-2, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread (ISO 898-2:1988)*.

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs (ISO 898-1:1999)*.

EN ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1: Test method (ISO 6507-1:1997)*.

The list of supporting product standards may be extended by further supporting standards for products which are used for high strength structural bolting for preloading. Such future standards will refer to the general requirements of prEN 14399-1, see also scope of A.1.1.

#### Dimensions and tolerances

As to dimensions and tolerances, the harmonized part prEN 14399-1 refers to the supporting product standards prEN 14399-3 to prEN 14399-6 which are at present under preparation.

#### Mechanical properties and testing

As to mechanical properties and testing, the harmonized part prEN 14399-1 refers to the supporting standards EN 20898-2 for nuts and EN ISO 898-1 for bolts. As to the washers, the mechanical properties are specified in the products standards prEN 14399-5 and prEN 14399-6, whereas the testing of the mechanical properties is specified in EN ISO 6507-1.

#### Functional characteristics

The harmonized standard prEN 14399-1 requires functional characteristics which are specified in the supporting standards prEN 14399-3 and prEN 14399-4 respectively and are tested according to the supporting standard prEN 14399-2, which is under preparation.

### A.1.3 Additional information, comments and remarks

#### 1 Deviations from a performance approach in the product standard

See proposal made in A.1.1 (iv) to delete some characteristics from the mandate as the product under A.1 is concerned.



**2 Request for clarification on the scope of the mandate concerning the product under A.1**

The scope of the mandate should not include connectors for railway applications and weld studs, see also comments under 0.1 and 0.3.

**3 Request for clarification on the intended uses concerning the product under A.1**

See comment under 0.2.

**4 Request for clarification on the essential characteristics for the intended uses included in the mandate concerning the products under A.1**

In A.1.1 (iv) it is explained why, according to the opinion of CEN/TC 185, the emission of radioactivity, which is required by the mandate, is not relevant. If the Commission insists on this characteristic, a justification should be given and a proposal should be made which limits should be specified and how should they controlled.

**5 Information on essential characteristics required by the mandate concerning the products under A.1, for which no work has yet been started in the TC, or for which the TC cannot provide a standard**

None.

**6 Explanation of the state of the art concerning durability issues**

A standard for the hot dip galvanizing of fasteners is in preparation, see prEN 10684:2002. Moreover, it is pointed to the standard: EN ISO 4042, *Fasteners — Electroplated coatings*.

**7 Information on other Directives under which the products under A.1 fall, and compliance conditions**

None.

**8 Specific request for additions to the mandate of materials, intended uses and essential characteristics, etc. concerning the products under A.1**

None.

**9 Other issues which the TC considers necessary for comprehension of the answer to the mandate**

The product under A.1 is an assembly consisting of a bolt and a nut. It is essential to specify the characteristics of the components of the assembly and its designation in **one** product standard (supporting standard), since there are two systems (HR and HV) where the components (bolts, nuts) are different and shall not be mixed up. The elaboration of separate standards for bolts and nuts is therefore not suitable.

**A.2 High strength structural bolting for preloading — Part 2: Suitability test for preloading (prEN 14399-2)**

Availability: Stage 40: 2001-12  
Stage 49: 2004-03  
Availability: 2005-03

**Note** The purpose of this test is to prove that the bolt/nut/washer assembly is suitable for high strength structural bolting for preloading, i.e. that the functional characteristics specified in the product standards (prEN 14399-3 and prEN 14399-4) and required in the harmonized standard (prEN 14399-1) are fulfilled.

### **A.2.1 Supporting standard**

**(i) Title:**

High strength structural bolting for preloading — Suitability test for preloading

**(ii) Scope:**

This part of this European standard specifies a tightening test to verify the suitability of high strength bolt/nut/washer assemblies for preloaded bolted connection in metallic structures.

The purpose of this test is to check the behaviour of the fastener assembly so as to ensure that the required preload can be reliably obtained by the tightening methods specified in ENV 1090-1 with sufficient margins against overtightening and against failure.

**(iii) Intended use:**

High strength structural bolting for preloading.

### **A.3 High strength structural bolting for preloading — Part 3: System HR — Hexagon bolt and nut assemblies (prEN 14399-3)**

Availability: Stage 40: 2001-12  
 Stage 49: 2004-03  
 Availability: 2005-03

#### **A.3.1 Supporting standard**

**(i) Title:**

High strength structural bolting for preloading — System HR — Hexagon bolt and nut assemblies

**(ii) Scope:**

This part of this European standard specifies, together with prEN 14399-1, the requirements for assemblies of high-strength structural bolts and nuts of system HR suitable for preloaded joints with large widths across flats, thread sizes M12 to M36 and property classes 8.8/8 and 10.9/10.

Bolt and nut assemblies to this part of this European standard have been designed to allow preloading of at least  $0,7 f_{ub} \times A_s^*)$  according to ENV 1993-1-1 (Eurocode 3) and to obtain ductility predominantly by plastic elongation of the bolt. For this purpose the components have the following characteristics:

- nut height according to style 1 (see ISO 4032)
- thread length of the bolt according to ISO 888

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\*)  $f_{ub}$  is the nominal tensile strength ( $R_m$ ) and  $A_s$  stress area of the bolt.

Bolt and nut assemblies to this part of this European standard include washers according to prEN 14399-6 or prEN 14399-5 (under the nut only).

Note Attention is drawn to the importance of ensuring that the bolts are correctly used if satisfactory result are to be obtained. For recommendations concerning proper application, reference to ENV 1090-1 is made.

The test method for suitability for preloading is specified in prEN 14399-2.

**(iii) Intended use:**

Structural metallic works.

**A.4 High strength structural bolting for preloading — Part 4: System HV — Hexagon bolt and nut assemblies (prEN 14399-4)**

Availability: Stage 40: 2001-12

Stage 49: 2004-03

Availability: 2005-03

**A.4.1 Supporting standard**

**(i) Title:**

High strength structural bolting for preloading — System HV — Hexagon bolt and nut assemblies

**(ii) Scope:**

This part of this European standard specifies, together with prEN 14399-1, the requirements for assemblies of high-strength structural bolts and nuts of system HV suitable for preloaded joints with large widths across flats, thread sizes M12 to M36 and property classes 10.9/10.

Bolt and nut assemblies to this part of this European standard have been designed to allow preloading of at least  $0,7 f_{ub} \times A_s^*)$  according to ENV 1993-1-1 (Eurocode 3) and to obtain ductility predominantly by plastic deformation of the engaged threads. For this purpose the components have the following characteristics:

- nut height approximately  $0,8 d$
- bolt with short thread length

Bolt and nut assemblies to this part of this European standard include washers according to prEN 14399-6 or prEN 14399-5 (under the nut only).

Note Attention is drawn to the importance of ensuring that the bolts are correctly used if satisfactory result are to be obtained. For recommendations concerning proper application, reference to ENV 1090-1 is made.

The test method for suitability for preloading is specified in prEN 14399-2.

Clamp lengths for the bolt/nut/washer assemblies are given in the normative Annex A.

**(iii) Intended use:**

Structural metallic works.

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\*)  $f_{ub}$  is the nominal tensile strength ( $R_m$ ) and  $A_s$  stress area of the bolt.

## **A.5 High strength structural bolting for preloading — Part 5: Plain washers (prEN 14399-5)**

Availability: Stage 40: 2001-12

Stage 49: 2004-03

Availability: 2005-03

### **A.5.1 Supporting standard**

#### **(i) Title:**

High strength structural bolting for preloading — Plain washers

#### **(ii) Scope:**

This part of this European standard specifies, together with prEN 14399-1, hardened and tempered plain washers intended for assembly with large series hexagon high-strength structural bolts and nuts with threads from M12 to M36 inclusive. Washers according to this standard can be applied under the nut only.

**Note** Attention is drawn to the importance of ensuring that the bolts are correctly used if satisfactory result are to be obtained. For recommendations concerning proper application, reference to ENV 1090-1 is made.

#### **(iii) Intended use:**

Structural metallic works.

## **A.6 High strength structural bolting for preloading — Part 6: Plain chamfered washers (prEN 14399-6)**

Availability: Stage 40: 2001-12

Stage 49: 2004-03

Availability: 2005-03

### **A.6.1 Supporting standard**

#### **(i) Title:**

High strength structural bolting for preloading — Plain chamfered washers

#### **(ii) Scope:**

This part of this European standard specifies, together with prEN 14399-1, hardened and tempered plain washers with chamfer intended for assembly with large series hexagon high-strength structural bolts and nuts with threads from M12 to M36 inclusive.

**Note** Attention is drawn to the importance of ensuring that the bolts are correctly used if satisfactory result are to be obtained. For recommendations concerning proper application, reference to ENV 1090-1 is made.

#### **(iii) Intended use:**

Structural metallic works.

## **B: Non-preloaded structural bolting**

### **B.1 Non-preloaded structural bolting — Part 1: General requirements**

Availability: Stage 40: 2004-06  
Stage 49: 2005-12  
Availability: 2006-12

#### **B.1.1 Harmonized standard**

**(i) Title:**

Non-preloaded structural bolting — Part 1: General requirements

**(ii) Scope:**

This part of this European standard specifies the general requirements for the components of bolt/nut/washer(s) assemblies for non-preloaded structural bolting and for the assemblies themselves.

For clauses of this European standard addressing the provisions of the EU Construction Products Directive, see Annex ZA.

**(iii) Intended use:**

Structural metallic works

**(iv) The essential characteristics according to the mandate which will be dealt with in the above standard will be:**

- Tolerances on dimensions and shape (bolts, nuts, washers)
- Elongation (bolts)
- Tensile strength (bolts)
- Tensile yield strength (bolts)
- Proof load (nuts, bolts) (!)
- Strength under wedge loading (bolts) (!)
- Impact strength (bolts)
- Hardness (bolts, nuts, washers)
- Shear strength: This is indirectly determined by determination of axial tensile strength.
- Release of cadmium and its compounds (bolts, nuts)
- Suitability of assembly for preloading (assemblies of bolts and nuts) (!)

Note All mechanical properties refer to property classes of bolts and nuts which are specified in EN ISO 898-1 and EN 20898-2 respectively.

The characteristics marked like this (!) are not covered by the mandate but are critical for the function of the fasteners and the assembly. They are major characteristics defined in EN ISO 898-1 and EN 20898-2.

The following characteristics which are mentioned in the mandate are, according to the opinion of CEN/TC 185, not relevant for bolts and nuts for non-preloaded structural bolting and should be deleted from the mandate:

- Fatigue strength: Fatigue strength is a function of the bolted connection but not of the bolts or nuts and depends on the mechanical characteristics tensile strength, yield strength, permanent elongation after fracture and the tolerances on dimensions and on form and position. There are no known national standards specifying fatigue strength of bolts or nuts for structural bolting.
- Fracture toughness/brittle strength: These characteristics are not evaluated for fasteners, see however the characteristic as alternative.
- Bonding strength: This is only relevant for some types of anchor bolts, which are not included in the mandate.
- Mechanical strength: As mechanical strength values for bolts and nuts tensile strength, yield strength and stress under proof load will be specified.
- Stiffness: Since bolts are loaded in axial direction, the stiffness of a bolted assembly is specified by the Youngs modulus and by the nominal cross section of the bolt. There is no national or international standard for measuring or testing Youngs modulus of bolts.
- Friction coefficient: These products are not intended or used for specific levels of preload and therefore determination of *k*-factor is not necessary.
- Weldability: These products are not designed or intended to be welded.
- Emission of radioactivity: Fasteners are manufactured from engineering steels which will conform to relevant EN steel specifications. Therefore, the emission of radioactivity is not relevant to the EN standards for bolts and nuts.

**(v) Durability aspects:**

The harmonized standard will contain provisions for hot dip galvanizing to improve corrosion resistance and for other surface coatings, including electroplated coatings.

**(iv) Other aspects:**

None

## **B.1.2 Supporting standards**

The following standard are proposed as supporting standards:

### **Dimensions, tolerances, mechanical properties and testing**

prEN 10204, *Metallic products — Types of inspection documents*.

prEN ...-2, *Non-preloaded structural bolting — Part 2: Suitability test*.

EN 20898-2, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread (ISO 898-2:1988)*.

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs (ISO 898-1:1999)*.

EN ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1: Test method (ISO 6507-1:1997)*.

## **Dimensions and tolerances**

As to tolerances for dimensions and for form and position, this harmonized standard refers to EN ISO 4759-1.

## **Mechanical properties and testing**

As to mechanical properties and testing, this harmonized standard refers to the supporting standards EN 20898-2 for nuts and EN ISO 898-1 for bolts. As to the washers, the mechanical properties are specified in this harmonized standard (see B.1.1), whereas the testing of the mechanical properties is specified in EN ISO 6507-1.

## **Functional characteristics**

This harmonized standard specifies functional characteristics of bolt/nut assemblies which are tested according to the supporting standard, which is under preparation, see B.2.

### **B.1.3 Additional information, comments and remarks**

#### **1 Deviations from a performance approach in the product standard**

See proposal made in B.1.1 (iv) to delete some characteristics from the mandate as the product under B.1 is concerned.

#### **2 Request for clarification on the scope of the mandate concerning the product under B.1**

The scope of the mandate should not include connectors for railway applications and weld studs, see also comments under 0.1 and 0.3.

#### **3 Request for clarification on the intended uses concerning the product under B.1**

See comment under 0.2.

#### **4 Request for clarification on the essential characteristics for the intended uses included in the mandate concerning the products under B.1**

In B.1.1 (iv) it is explained why, according to the opinion of CEN/TC 185, the emission of radioactivity, which is required by the mandate, is not relevant. If the Commission insists on this characteristic, a justification should be given and a proposal should be made which limits should be specified and how should they controlled.

#### **5 Information on essential characteristics required by the mandate concerning the products under B.1, for which no work has yet been started in the TC, or for which the TC cannot provide a standard**

None.

#### **6 Explanation of the state of the art concerning durability issues**

A standard for the hot dip galvanizing of fasteners is in preparation, see prEN 10684:2002. Moreover, it is pointed to the standard: EN ISO 4042, *Fasteners — Electroplated coatings*.

**7 Information on other Directives under which the products under B.1 fall, and compliance conditions**

None.

**8 Specific request for additions to the mandate of materials, intended uses and essential characteristics, etc. concerning the products under B.1**

None.

**9 Other issues which the TC considers necessary for comprehension of the answer to the mandate**

None.

**B.2 Non-preloaded structural bolting — Part 2: Suitability test**

Availability: Stage 40: 2004-06

Stage 49: 2005-12

Availability: 2006-12

Note The purpose of this test is to prove that the bolt/nut/washer assembly is suitable for non-preloaded structural bolting, i.e. that the functional characteristics required in the harmonized standard are fulfilled.

**B.2.1 Supporting standard**

**(i) Title:**

Non-preloaded structural bolting — Suitability test

**(ii) Scope:**

This part of this European standard specifies a tensile test to verify the suitability for non-preloaded bolted connection in metallic structures.

**(iii) Intended use:**

Structural metallic works.



## Annex

### List of changes in this answer from CEN/TC 185 as against the answer from 2000

#### Clause 0 General comments of CEN/TC 185 as to the answer to the mandate

#### Clause 03

A remark concerning weld nuts was added.

#### Clause 04

Studs and stud bolts were added as products where CEN/TC 185 has not yet started elaboration of standards.

#### Change in the structure of the main body of the answer

Revised answer 2004	Original answer 2000
<b>A: High-strength structural bolting for preloading</b>	<b>A: Hexagon bolt and nut assemblies for high-strength structural bolting</b>
A.1 Part 1: General requirements (harmonized standard)	A.1 Hexagon bolt and nut assemblies — System HR (harmonized standard)
A.2 Part 2: Suitability test for preloading (supporting standard)	A.2 Hexagon bolt and nut assemblies — System HV (harmonized standard)
A.3 Part 3: System HR — Hexagon bolt and nut assemblies (supporting standard)	A.3 Plain washers, chamfered for high-strength structural bolting — Systems HR and HV (harmonized standard)
A.4 Part 4: System HV — Hexagon bolt and nut assemblies (supporting standard)	A.4 Plain washers for high-strength structural bolting — System HR (harmonized standard)
A.5 Plain washers (supporting standards)	
A.6 Plain washers, chamfered (supported standard)	
<b>B: Non-preloaded structural bolting</b>	
B.1 Part 1: General requirements (harmonized standard)	
B.2 Part 2: Suitability test (supporting standard)	

#### Change of dates for availability

##### A.1 to A.6

Availability: 2005-03

##### A.1 to A.4

Availability: 2003-03

**Clause A.1.1 (iv): Essential characteristics according to the mandate which will be dealt with in the harmonized standard**

The characteristics

- Shear strength
- Friction coefficient

have been added to the essential characteristics which will be dealt with in the harmonized standard (see A.1).

The reasons why the characteristics

- Fatigue strength
- Bonding strength
- Stiffness
- Weldability

are, according to the opinion of CEN/TC 185, not relevant for bolts and nuts for high-strength structural bolting, have been revised.