BRITISH STANDARD

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1090-1:2009
+A1:2011

Execution of steel structures and aluminium structures

Part 1: Requirements for conformity assessment of structural components

ICS 91.080.10

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 1090-1:2009+A1:2011. It supersedes BS EN 1090-1:2009, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by ▌A1⟩ ⟨A1▐.

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A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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Foreword

This document (EN 1090-1:2009+A1:2011) has been prepared by Technical Committee CEN/TC 135 “Execution of steel and aluminium structures”, the secretariat of which is held by SN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

This document includes Corrigendum 1[1] issued by CEN on 2010-11-17 and Amendment 1, approved by CEN on 2011-10-03.

This document supersedes EN 1090-1:2009.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1〉 〈A1▌.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[1] This corrigendum has been superseded by the changes of EN 1090-1:2009/FprA1:2011.

Introduction

This harmonised European Standard is a part of a group of European standards dealing with design and manufacturing of load bearing components and structures made of steel or aluminium.

This harmonised European Standard deals with provisions for conformity assessment of components which imply conformity to performance characteristics declared by the manufacturer of the components.

The components have structural characteristics which make them fit for their particular use and function.

The structural characteristics are governed by the design and the manufacture of the components.

This harmonised European Standard does not contain rules for structural design and manufacture. Such rules are called up from the relevant parts of Eurocode for design requirements and from EN 1090-2 (steel) and EN 1090-3 (aluminium) for execution requirements.

To use this harmonised European Standard for assessment and declaration of conformity of structural steel or aluminium components all relevant design and execution standards within the group need to be available.

This harmonised European Standard has been prepared to satisfy Mandate M 120 – Structural metallic products and ancillaries (2/4) – issued by the European Commission.

1 Scope

This European Standard specifies requirements for conformity assessment of performance characteristics for structural steel and aluminium components as well as for kits placed on the market as construction products. The conformity assessment covers the manufacturing characteristics, and where appropriate the structural design characteristics.

This European Standard covers also the conformity assessment of steel components used in composite steel and concrete structures.

The components can be used directly or in construction works or as structural components in the form of kits.

This European Standard applies to series and non-series structural components including kits.

The components can be made of hot rolled or cold formed constituent products or constituent products produced with other technologies. They may be produced of sections/profiles with various shapes, flat products (plates, sheet, strip), bars, castings, forgings made of steel and aluminium materials, unprotected or protected against corrosion by coating or other surface treatment, e.g. anodising of aluminium.

This European Standard covers structural cold formed members and sheeting as defined in EN 1993-1-3 and EN 1999-1-4.

This European Standard does not cover conformity assessment of components for suspended ceilings, rails or sleepers for use in railway systems.

NOTE For certain steel and aluminium components, particular specifications for performance and other requirements have been developed. The particular specifications may be issued as an EN or as Clauses within an EN. An example is given in EN 13084-7 for single wall steel chimneys and steel liners. Such particular specifications will take precedence in case of non-compliance with the requirements of this European Standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1090-2	*Execution of steel structures and aluminium structures — Part 2: Technical requirements for steel structures*
EN 1090-3	*Execution of steel structures and aluminium structures — Part 3: Technical requirements for aluminium structures*
EN 1990:2002	*Eurocode*: *Basis of structural design*
EN 1991 (all parts)	*Eurocode 1*: *Actions on structures*
EN 1993 (all parts)	*Eurocode 3*: *Design of steel structures*
EN 1994 (all parts)	*Eurocode 4*: *Design of composite steel and concrete structures*
EN 1998 (all parts)	*Eurocode 8*: *Design of structures for earthquake resistance*
EN 1999 (all parts)	*Eurocode 9*: *Design of aluminium structures*
EN 10045-1	*Metallic materials — Charpy impact test — Part 1: Test method*

EN 10164	*Steel products with improved deformation properties perpendicular to the surface of the product — Technical delivery conditions*
EN 13501-1	*Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
EN 13501-2	*Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*
EN ISO 9001	*Quality management systems — Requirements (ISO 9001:2000)*
EN ISO 14731	*Welding coordination — Tasks and responsibilities (ISO 14731:2006)*
ISO 7976-1	*Tolerances for building — Methods of measurement of buildings and building products — Part 1: Methods and instruments*
ISO 7976-2	*Tolerances for building — Methods of measurement of buildings and building products — Part 2: Position of measuring points*
ISO 17123-1	*Optics and optical instruments — Field procedures for testing geodetic and surveying instruments — Part 1: Theory*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
component specification
document or documents giving all necessary information and technical requirements for manufacturing the structural component

3.1.2
constituent products
materials or products used in manufacturing with properties which enter into structural calculations or otherwise relate to the mechanical resistance and stability of works and parts thereof, and/or their fire resistance, including aspects of durability and serviceability

3.1.3
design brief
documents containing all information necessary to perform a structural design of the component, considering its intended use

3.1.4
European technical specifications
European Standards and European Technical Approvals for construction products

3.1.5
evaluation method
means to check that the performance characteristics of the component comply with the values to be declared and any other required values which are used for evaluation of conformity for characteristics such as material properties, geometry and structural characteristics

NOTE 1 Where physical tests are carried out as the basis for the evaluation, the term test method is used.

NOTE 2 Where structural calculations are used to evaluate the load bearing capacity and/or the fatigue strength, the term initial type calculation (ITC) is used.

3.1.6
load bearing capacity
value or set of values for the loads that can be carried by the component referring respectively to either a single type and direction of loading or to a set of loads in various directions and referring to a defined level of resistance in accordance with EN 1990 and the relevant parts of EN 1993, EN 1994 or EN 1999. For kits the load bearing capacity refers to loads and load combinations the kit can carry that are relevant to the structure for its intended purpose.

NOTE The term load bearing capacity in this European Standard refers to situations for which the loads are predominantly static such that the influence of repetitive loads with a potential for fatigue need not be considered. The criteria for where fatigue needs to be considered are given in EN 1993 for steel components and in EN 1999 for aluminium components.

3.1.7
manufacturing
those work operations required to produce the component, which may encompass fabrication, welding, mechanical fastenings, assembly, testing and documentation of the performance characteristics declared

3.1.8
structural characteristics
properties of the component connected with its ability to function satisfactorily under the influence of the actions it is subject to

NOTE In this European Standard the performance characteristics, load bearing capacity, fatigue strength and resistance to fire are defined as structural characteristics together with the manufacturing characteristics that influence the structural behaviour of the component. Manufacturing characteristics are e.g. the execution classes, the welding quality, the geometrical accuracy (tolerances) or the surface properties, i.e. all properties that have influence on the structural behaviour.

3.1.9
structural components
components to be used as load-bearing parts of works designed to provide mechanical resistance and stability to the works and/or fire resistance, including aspects of durability and serviceability which can be used directly as delivered or can be incorporated into a construction work

3.1.10
structural kit
set of structural components to be assembled and installed on site

NOTE The assembled system of the structural components is a “structure”.

3.1.11
weldability
quality of a steel or aluminium material for which a qualified welding procedure can be developed

NOTE See EN ISO 15607.

3.2 Abbreviations

The following abbreviations are used in this European Standard:

FPC factory production control

ITC initial type calculation

ITT initial type testing

MPCS manufacturer provided component specification

NDP nationally determined parameter, a term used in the Eurocodes where a national provision is allowed

NPD no performance determined, a term used if the actual characteristic has not been tested

NOTE This can be the case if e.g. the actual characteristic is not regulated in the member state where the component is to be used.

PPCS purchaser provided component specification

R, E, I M performance characteristics related to testing of fire resistance in accordance with EN 13501-2 with the following meaning for the individual characteristics:

R fire resistance in minutes under a given set of actions on the component

E integrity (maintaining the integrity as a separating element)

I insulation (ability as a separating element to keep the temperature increase on the none fire exposed side below a set limit)

M mechanical action (resistance to withstand dynamic impact by testing – after completed fire heating)

4 Requirements

4.1 Constituent products

4.1.1 General

Structural components of steel and aluminium shall be made of constituent products as given in 4.1.2 and 4.1.3, respectively.

4.1.2 Constituent products for steel components

Constituent products for steel components shall be in accordance with the European Standards referred to in the relevant Clauses of EN 1090-2.

NOTE The standards referred to in EN 1090-2 give information about the strength properties, weldability and fracture toughness of the steels.

4.1.3 Constituent products for aluminium components

Constituent products for aluminium components shall be in accordance with the European Standards referred to in the relevant Clauses of EN 1090-3.

NOTE The standards referred to in EN 1090-3 give information about the strength properties of the aluminium alloys.

4.2 Tolerances on dimensions and shape

The geometrical tolerances specified in EN 1090-2 and EN 1090-3 for the essential tolerances shall apply to all components. If any special tolerances apply these shall be stated in the component specification.

NOTE According to EN 1090-2 and EN 1090-3 the requirements for functional tolerances apply to all components.

4.3 Weldability

If steel and aluminium structural components are to be declared as weldable they shall be made of weldable constituent products according to EN 1090-2 or EN 1999-1-1 as appropriate. If relevant to the performance of a steel product the through-thickness properties shall be declared.

4.4 Fracture toughness

Steel components shall be manufactured from constituent products that meet the fracture toughness properties required. The constituent products specified in the component specification shall be used.

NOTE 1 The fracture toughness properties of the steel are given in relation to the Charpy impact test using the reference temperature and the material thickness.

Fracture toughness is not tested or specified for aluminium materials.

NOTE 2 The material properties for aluminium alloys improve for decreasing temperatures.

4.5 Structural characteristics

4.5.1 General

Structural characteristics of a component covered in this European Standard refer to its ⟦A1⟩ load bearing capacity, deformation at serviceability limit state, ⟨A1⟧ fatigue strength and resistance to fire.

⟦A1⟩ *deleted text* ⟨A1⟧

The required structural characteristics shall be achieved by:

— an adequate structural design, if and as required for the component, and

— manufacturing the component according to the component specification developed in accordance with EN 1090-2 or EN 1090-3.

4.5.2 Load bearing capacity

Declaration of the load bearing capacity may refer to the resistance of the cross sections of the component, expressed as a characteristic value or as a design value. Alternatively the load bearing capacity may be expressed in terms of the loads the component can carry according to the applied design provisions, expressed as a characteristic value or as a design value.

4.5.3 Fatigue strength

Declaration of the fatigue strength of a structural component shall be specific to fatigue actions against which the fatigue strength has been assessed.

Fatigue strength in this standard refers to situations for which the loads are such that the influence of repetitive loads needs to be considered to assess the structural characteristics of the component.

NOTE 1 Requirements for fatigue strength are needed for certain component applications where the specific requirements should be given in the design brief in terms of stress range(s), number of cycles, etc, and where the requirements are formulated according to the provisions in the relevant Eurocode.

NOTE 2 Fatigue strengths are related to cross sectional resistance or resistance of a given structural detail and are usually expressed by reference to S-N diagrams.The conceptual strategy for determination of fatigue strength should be based on the approaches given in the relevant Eurocode. Information on the strategy should be given in the design brief.

4.5.4 Resistance to fire

Declaration of the fire resistance of a structural member may refer to the fire exposure represented by the standard temperature-time relationship to be used for assessment of the performance characteristics R, E, I and M in the classification according to EN 13501-2.

Combinations of these designatory letters, as appropriate, are to be supplemented by a number which in elapsed completed minutes of the nearest lower class during which the functional requirements are satisfied, to provide the classification of performance.

The classification periods against any of the characteristics shall be declared in minutes, using one of the periods: 15, 20, 30, 45, 60, 90, 120, 180, 240 or 360.

Alternatively a declaration of fire resistance under a given set of actions on the component during a fire exposure may be referenced to other specified fire exposures than the standard temperature-time relationship such as the parametric temperature-time curves according to Annex A of EN 1991-1-2.

The requirements to resistance to fire of a component is under the responsibility of each Member State and is generally dependent on the type of structure/building it will be in, where in the structure/building and finally its function in the structural system. This shall appear from the design brief.

NOTE The requirements of a component can include requirements to more than one performance characteristic.

〈A1〉

4.5.5 Deformation at serviceability limit state

The deformations at serviceability limit state determined by using the appropriate combination of actions shall be within the required limits for vertical and horizontal deformations specified in the design assumptions and/or European Standards (e.g. National Determined Parameters, NDP, of the National Annex of EN 1990, EN 1993, EN 1994 and/or EN 1999). 〈A1〉

4.6 Reaction to fire

Declaration of the reaction to fire shall be in accordance with the classes and test requirements given in EN 13501-1.

4.7 Dangerous substances

Dangerous substances in this standard refer to the material properties with regard to emission of radioactivity or release of cadmium. Only constituent products shall be used for which any emission of radioactivity and any release of cadmium is non-existent or limited to be within an accepted limit in the territory of intended destination. Materials used in coatings shall not release or emit any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material, or permitted in national provisions of the member state of destination.

4.8 Impact resistance

Impact resistance is a material characteristic which expresses the same properties of steel as fracture toughness. There are no additional requirements.

4.9 Durability

The component specification shall specify any requirements for corrosion protection. See EN 1090-2 for carbon steel, EN 1993-1-4 for stainless steel and EN 1999-1-1 for aluminium.

NOTE 1 The durability of components is dependent on their use and the exposure they are subject to and any protection applied.

NOTE 2 The performance characteristics of structural components manufactured from steel or aluminium adequately designed and manufactured are not subject to degradation except where corrosion is allowed to occur. Corrosion can be prevented by the use of protection systems. The service life of a component is preserved by adequate maintenance of the component.

NOTE 3 For components made from weather-resistant steels to EN 10025-5 or stainless steels to EN 10088 a service life of the component can be estimated. EN 1993-1-4 gives guidance related to durability of stainless steel.

NOTE 4 EN 1999-1-1 gives guidance related to durability of aluminium alloys. For aluminium components under normal exposure conditions corrosion protection is normally not required.

NOTE 5 EN 1090-2 and EN 1090-3 give guidance for application of a corrosion protection system and give requirements for surface preparation of the steel and aluminium respectively as a pre-treatment prior to any subsequent application of a protection system, depending on the exposure conditions.

5 Evaluation methods

5.1 General

The term 'evaluation method' is used for all kinds of methods used to demonstrate compliance with the requirements, e.g. physical testing, measurements of geometry and structural calculations whether assisted or not by physical testing.

5.2 Constituent products

The constituent products shall be evaluated by checking that the inspection documents for the products used comply with the requirements of the component specification.

The evaluation of constituent products shall also include a check that the geometry of the products is correct, using methods and instruments in accordance with 5.3.

5.3 Tolerances on dimensions and shape

Geometrical tolerances shall be measured using methods and instruments selected from those listed in ISO 7976-1 and ISO 7976-2 and in accordance with provisions given in EN 1090-2 and EN 1090-3. Accuracy of measurements shall be assessed in accordance with ISO 17123-1.

5.4 Weldability

For weldability, reliance may be placed on properties associated with constituent materials and components provided these are given by reference to a European Technical Specification and inspection documents.

NOTE 1 EN 1090-2 gives information on weldability of steel materials.

NOTE 2 EN 1999-1-1 and EN 1011-4 give information on weldability of aluminium materials.

If through-thickness properties are specified for steel products, they shall be assessed according to the quality classes given in EN 10164.

5.5 Fracture toughness

For fracture toughness of the constituent products, reliance may be placed on properties for impact strength associated with materials and components used as constituent products provided these are given by reference to a European Technical Specification and inspection documents.

If data for the constituent products are not available, fracture toughness may be assessed using Charpy impact tests carried out in accordance with EN 10045-1. For steel components provisions for evaluation of the test results are given in EN 1993-1-10.

Testing the fracture toughness of aluminium constituent products is not required.

5.6 Structural characteristics

5.6.1 General

Assessment of structural characteristics shall be based on:

a) the structural design, and

b) the manufacturing characteristics of the component.

5.6.2 Structural design

An adequate structural design may be demonstrated by:

a) structural calculations, or

b) structural testing supported by structural calculations for the component.

5.6.2.1 Structural calculations

Structural calculations may be used to determine the structural design characteristics of the component and that the requirements given in the design brief are met.

The structural design calculations shall be in accordance the relevant Eurocodes. In a general case this requires the use of:

a) EN 1990, *Eurocode: Basis of structural design;*

b) EN 1991, *Eurocode 1: Actions on structures* (all relevant parts);

c) EN 1993, *Eurocode 3: Design of steel structures* (all relevant parts)

d) EN 1994, *Eurocode 4: Design of composite steel and concrete structures* (all relevant parts for the steel parts in composite structures);

e) EN 1998, *Eurocode 8: Design of structures for earthquake resistance* (all relevant parts);

f) EN 1999, *Eurocode 9: Design of aluminium structures* (all relevant parts).

To determine the structural characteristics of a component, provisions given in the National Annexes to the Eurocodes for the country where the component shall be used apply.

5.6.2.2 Structural testing

Structural testing shall be based on European Standards, and be accompanied by structural calculations.

NOTE 1 There is presently no general European Standard available for structural testing.

NOTE 2 For components where declaration of conformity is made according to method 3b, see Annex A, national provisions for structural testing can be relevant.

NOTE 3 Testing procedures for cold formed members and sheeting are given in Annex A of EN 1993-1-3:2006 and EN 1999-1-4.

NOTE 4 Provisions for evaluation of the results from structural testing are given in Annex D of EN 1990:2002.

5.6.3 Manufacturing characteristics

The manufacturing characteristics shall be assessed in relation to the requirements in the component specification.

The manufacturing of components shall be inspected and evaluated in accordance with the requirements for inspection to the specified execution class and tolerance requirements in compliance with the provisions in EN 1090-2 for steel structures or EN 1090-3 for aluminium structures.

5.7 Resistance to fire

The component specification shall specify all necessary information on the evaluation methods to be used; either they are performed by calculation or by testing.

Performance characteristic R: A component's resistance to fire may be evaluated according to test results and the classification standard EN 13501-2, or by using a calculation method from the Eurocodes listed in 5.6.2 and a fire exposure according to the standard temperature-time relationship referred to in EN 13501-2.

Performance characteristic I: A component's integrity as a separating element may be evaluated according to test results and the classification standard EN 13501-2, or by using a calculation method according to EN 1994-1-2, and a fire exposure according to the standard temperature-time relationship referred to in EN 13501-2.

Alternatively, if the evaluation of fire resistance or integrity is based on calculation according to another specified fire exposure than the standard temperature-time relationship, the characteristic should not be designated R or I as these are designations for class of resistance according to EN 13501-2.

Performance characteristics E and M: These performance characteristics may only be evaluated based on testing in accordance with the classification standard EN 13501-2.

5.8 Reaction to fire

Constituent products of steel and aluminium fall within Class A1 of the European classification with respect to reaction to fire, and no further documentation is required. Galvanized steels and anodized aluminium components are also Class A1.

In the case of coated components it shall be demonstrated that the component has a fire classification that complies with the requirements according to its use and function. Classification shall be performed in accordance with EN 13501-1.

NOTE Reaction to fire of coatings applied to steel or aluminium components for durability or other purposes can be other than Class A1. Information on reaction to fire of organically coated steel sheets is given in EN 14782 and EN 14783.

5.9 Dangerous substances

The requirement in 4.7 is fulfilled if the constituent products comply with the European Standards referenced in EN 1090-2 for steel or EN 1090-3 for aluminium. No further testing is required unless protective coatings are used for which a possible emission cannot be assessed indirectly by control of the raw coating material.

5.10 Impact resistance

Impact resistance of steel products is assessed by evaluation of the fracture toughness of the product.

5.11 Durability

There is no direct method for testing durability. Durability is indirectly evaluated by checking the exposure of the component and by evaluating any requirements for surface protection given in the component specification.

6 Evaluation of conformity

6.1 General

The conformity of a component or kit with the requirements of this European Standard and with the stated values (including classes) shall be demonstrated by:

a) initial type testing, see 6.2; and

b) factory production control by the manufacturer, including inspection and testing of products sampled from production in accordance with a prescribed plan by the manufacturer, see 6.3.

For the purposes of testing, components or kits may be grouped into families if the selected property/properties is/are common to all components within that family.

A family of welded steel components may be characterized by the parent material and the welding process used. Materials of lower strength and materials which are more weldable may be included in the same family.

A family of welded aluminium components may be characterized by the material group and the welding process applied whereby 7xxx alloys cover all other alloys, 6xxx alloys cover 5xxx alloys and 3xxx alloys, 5xxx alloys and 3xxx alloys may be regarded as one group.

Non-welded components in the same execution class may be treated as a family.

6.2 Initial type testing

6.2.1 General

Initial type testing is the complete set of tests or other procedures, determining the performance of samples of products representative of the product type. The intention is to demonstrate and assess that the manufacturer has the capabilities to provide structural components and kits according to this European Standard. The assessment is related to two possible tasks performed by the manufacturer:

a) Initial type calculation (ITC) to assess the structural design capabilities, where the manufacturer shall declare structural characteristics governed by design of the component;

b) Initial type testing (ITT) to assess the manufacturing capabilities.

Initial type testing shall be performed:

1) at the commencement of the production of a new component or the use of new constituent products (unless a component of the same family);

2) at the commencement of a new or modified method of production if this would affect a characteristic subject to evaluation;

3) if production is changed to a higher execution class.

In case of type testing of components or kits for which initial type evaluation in accordance with this standard has already been performed, type evaluation may be reduced:

— if it has been established that the performance characteristics compared with the already evaluated components or kits have not been affected; or

— in accordance with the rules for grouping into families or direct extended application of test results.

If components are used whose characteristics have already been determined by the component manufacturer on the basis of conformity with other product standards (e.g. manufacturing using constituent products declared as conforming to a European Technical Specification), these characteristics need not be re-

evaluated, provided the characteristics of constituent products and components used in the manufacturing process maintain their declared characteristics. Constituent products and components CE marked in accordance with appropriate harmonised European specifications may be presumed to have the performances stated with the CE marking.

6.2.2 Characteristics

All characteristics for which the manufacturer provides a declaration shall be determined using initial type testing, with the following exceptions:

a) reaction to fire of a component which may be assessed indirectly by controlling the component's constituent products;

b) release of dangerous substances which may be assessed indirectly by controlling the content of the component's constituent products;

c) durability of all characteristics, which is ensured by correct specification to avoid corrosion or to limit its effect by a prescriptive requirement for corrosion protection of the components.

6.2.3 Use of historical data

Evaluations previously performed in accordance with the provisions of this European Standard (same component type, same characteristic(s), same test method, same sampling procedure, same system of attestation of conformity etc.) may be taken into account.

6.2.4 Use of structural calculations for conformity assessment

If structural calculations are used to determine characteristic or design values to be declared, the conformity evaluation of these characteristics (ITC) shall be based on the manufacturer's personnel resources (employed directly or by a sub-contractor), equipment and procedures used to perform structural calculations for the range of components to be manufactured.

Procedures for the structural design process shall be documented and shall encompass handling of design assumptions, design methods, design calculations including any use of computer programs and results of the calculations with demonstration of procedures for corrective actions to be taken in case of non conformity.

In cases where the manufacturer produces components in accordance with calculations and component specifications provided by the purchaser, the conformity evaluation shall check that the components or kits comply with the component specification.

6.2.5 Initial type calculation

An initial type calculation carried out for a component can be used for documentation of subsequent manufactured components with the same performance characteristics. A new or revised type calculation shall be carried out if there is a change in one or more of the structural performance characteristics that are affected by a change in the design brief of the component.

6.2.6 Sampling, evaluation and conformity criteria

The number of samples to be evaluated representing a component or family of components shall be in accordance with Table 1.

6.2.7 Declaration of performance characteristics

All performance characteristics given in Table 1 shall be declared by the manufacturer of the component. NPD may be declared if this complies with the method for declaration, or if there are no requirements for the performance characteristic where the component shall be used.

6.2.8 Recording of results from evaluations

The results from all Initial Type Evaluations shall be recorded and held by the manufacturer for at least five years.

NOTE National provisions can have more stringent requirements for keeping results from Initial Type Evaluations.

6.2.9 Corrective actions

If corrective actions are needed to satisfy the requirements of this European Standard, the corrective actions shall be carried out as given in EN 1090-2 for steel components and EN 1090-3 for aluminium components.

Table 1 – Sampling, evaluation and conformity criteria for initial type testing and initial type calculation

Characteristic	Requirement Clause	Evaluation method	Number of samples	Conformity criteria
Tolerances on dimensions and shape	4.2	Inspection and test in accordance with EN 1090-2 or EN 1090-3	1	5.3
Weldability	4.3	Checking of inspection documents for compliance with the specified requirements to the constituent product.	1	5.4
Fracture toughness / brittle strength (steel components only)	4.4	Checking of inspection documents for compliance with the specified requirements to the constituent product	1	5.5
Load bearing capacity	4.5, 4.5.2	Calculation to relevant Part of EN 1993, EN 1994, EN 1999 or structural testing to relevant European Technical Specification [b] Manufacturing according to component specification and EN 1090-2 or EN 1090-3 [c]	1 [a]	5.6
Fatigue strength	4.5, 4.5.3	Calculation to relevant Part of EN 1993, EN 1994 or EN 1999 [b] Manufacturing according to component specification and EN 1090-2 or EN 1090-3 [c]	1 [a]	5.6
A1 Deformation at serviceability limit state [b]	4.5.5	Calculation to relevant Part of EN 1990, EN 1993, EN 1994, EN 1999 or structural testing to relevant European Technical Specification [b] Manufacturing according to component specification and EN 1090-2 or EN 1090-3 [c]	1 [a]	5.6 A1
Resistance to fire	4.5, 4.5.4	Calculation in accordance with EN 1993, EN 1994 or EN 1999 for performance characteristic R or test and classification in accordance with EN 13501-2 for performance characteristics, R, E, I and/or M [b] Manufacturing according to component specification and EN 1090-2 or EN 1090-3 [c]	1 [a]	5.7
Reaction to fire	4.6	Checking of coated components in accordance with EN 13501-1	1	5.8
Dangerous substances	4.7	Checking that constituent products conform to European Standards	1	5.9
Impact resistance	4.8	Evaluation covered by fracture toughness	1	5.10
Durability	4.9	Execution of surface preparation in accordance with component specification, EN 1090-2 or EN 1090-3	1	5.11

[a] A single calculation shall be sufficient for evaluation of conformity. If the characteristic is determined by tests, the number of test samples shall be in accordance with EN 1990, EN 1993, EN 1994 and EN 1999 as relevant for evaluation of the test results.

[b] If the manufacturer shall declare characteristics determined from structural design.

[c] In accordance with the execution class that is subject for the initial type test.

6.3 Factory production control

6.3.1 General

The manufacturer shall establish, document and maintain a factory production control (FPC) system to ensure that products placed on the market conform to the declared performance characteristics.

The FPC system shall consist of written procedures, regular inspections and tests and/or assessments and the use of results to control the component's constituent products, equipment, the production process and the manufactured component.

A FPC system conforming to the requirements of EN ISO 9001 and made specific to the requirements of this European standard shall be considered to satisfy the above requirements.

NOTE A quality system does not necessarily need to be in accordance with EN ISO 9001 to satisfy the requirements to FPC of this European Standard.

The results of inspections, tests and assessments stated in the manufacturer`s FPC system shall be recorded. The action to be taken if control values or criteria are not met shall be recorded and retained for the period specified in the manufacturer's FPC procedures.

The assessment of FPC shall be as Annex B.

6.3.2 Personnel

The responsibility, authority and the relationship between personnel that manage, perform or verify work affecting product conformity, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-conformity from occurring, actions in case of non-conformities and to identify and register any conformity problems.

The FPC system shall describe measures to ensure that personnel involved in activities influencing the conformity of the components have adequate qualifications and training for the range of components and execution classes to be exercised by the manufacturer.

6.3.3 Equipment

Weighing, measuring and testing equipment influencing the conformity of the components shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

Equipment used in the manufacturing process shall be regularly inspected and maintained to ensure that use, wear and failure does not cause significant inconsistency in the manufacturing process.

Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures. The records shall be retained for the period defined in the manufacturer's FPC procedures.

6.3.4 Structural design process

In the case of structural design carried out by the manufacturer, the FPC system shall ensure compliance with the design brief, identify the procedures for checking the calculations and those individuals responsible for the design.

The records shall be sufficiently detailed and accurate to demonstrate that the manufacturer's design responsibilities have been carried out satisfactorily. A record of the documents shall be retained for a period defined in the manufacturers FPC procedure.

6.3.5 Constituent products used in manufacture

The manufacturer shall implement a written inspection procedure for checking and recording that constituent products conform to the specification, and for tracing that they are correctly used in component manufacture. The requirements for traceability of constituent products given in EN 1090-2 and EN 1090-3 shall be complied with.

The specification for the constituent products used in manufacture shall be retained according to the manufacturer`s FPC procedures.

NOTE The requirements for traceability in EN 1090-2 and EN 1090-3 are dependent on execution class.

6.3.6 Component specification

The manufacture of components shall be controlled using a component specification giving all the necessary information of the component in sufficient detail to enable it to be manufactured and for its conformity to be evaluated.

The execution class to be applied shall be given in the component specification, see EN 1090-2 and EN 1090-3.

The manufacturer shall implement a written inspection and test plan for checking and recording that manufactured components conform to their component specification.

The component specification shall be prepared from design information. To the extent that the manufacturer undertakes the preparation of the component specification from design information Clause 6.3.4 applies.

Annex A gives guidance on preparation of the component specification.

NOTE In many cases the responsibility for preparation of the component specification will have been shared between the manufacturer and the purchaser (or designers acting on their behalf). A manufacturer’s declaration that a component complies with its component specification does not cover those aspects of design not undertaken by the manufacturer, nor does it cover that they have been correctly incorporated into its component specification.

6.3.7 Product evaluation

The manufacturer shall establish procedures to ensure that the declared values and classes of all of the characteristics are maintained. The means of production control of characteristics and the sampling methods for a component or family to be evaluated shall be in accordance with Table 2.

If the component specification includes a prescribed inspection and test plan for component properties then those requirements shall be followed in addition to the requirements given in Table 2.

6.3.8 Non-conforming products

The manufacturer shall have written procedures that specify how to deal with non-conforming products. Such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer’s written procedures. The procedures shall conform with EN 1090-2 or EN 1090-3 as appropriate.

Table 2 – Frequency of product testing as part of factory production control

Characteristic	Requirement Clause	Evaluation method	Sampling	Conformity criteria
Tolerances on dimensions and shape	4.2	Inspection and test in accordance with EN 1090-2 or EN 1090-3	Each component [a]	5.3
Weldability	4.3	Checking of inspection documents for compliance with the specified requirements to the constituent product	Documentary checks of all constituent products used in manufacture	5.4
Fracture toughness / brittle strength (steel components only) + Impact resistance [b]	4.4 4.8	Checking of inspection documents for compliance with the specified requirements to the constituent product	Documentary checks of all constituent products used in manufacture	5.5 5.10
Yield, proof or tensile strength of constituent products used in manufacture	4.5	Checking of inspection documents for compliance with the specified requirements to the constituent product	Documentary checks of all constituent products used in manufacture	5.2
A1 Structural characteristics governed by the structural design (load bearing capacity, deformation at serviceability limit state, fatigue strength, resistance to fire) A1	4.1	Check that the design is carried out according to the relevant Eurocode.	Check that the calculations are relevant and verified for the manufactured component.	5.6.2
Structural characteristics governed by manufacturing	4.5.1	Check that manufacturing is done in accordance with the component specification and EN 1090-2 or EN 1090-3.	Check in accordance with the requirements to inspection in EN 1090-2 or EN 1090-3 and the component specification.	5.6.3
Durability	4.9	Check that manufacturing is done in accordance with EN 1090-2 and EN 1090-3.	Check in accordance with the requirements to inspection in EN 1090-2 or EN 1090-3.	5.11

[a] This requirement may be reduced if the components are manufactured under similar conditions or if the geometry is not critical for their use.

[b] See 4.8 and 5.10.

7 Classification and designation

The component shall be classified in accordance with the execution classes given in EN 1090-2 for steel components and EN 1090-3 for aluminium components.

NOTE Execution classes (EXC) are defined for steel in EN 1090-2 and for aluminium in EN 1999-1-1. EN 1090-2 and EN 1090-3 define two types of tolerances, referred to as essential tolerances and functional tolerances, and give numerical values for acceptable geometrical deviations.

8 Marking

The component shall be delivered with a mark that clearly identifies it, with reference to the component specification.

Hard stamping may only be used if and where positions have been agreed with the purchaser. For requirements and restrictions on marking, see EN 1090-2 and EN 1090-3.

Annex A
(informative)

Guidelines for preparation of the component specification

A.1 General

This Annex gives guidelines for the preparation of the component specification with regards to who has the task of preparing it and what form the specification may take. Below the two principle approaches are described; i.e. the purchaser provides the component specification or the manufacturer provides it. In many cases the purchaser and manufacturer are both contributing to its preparation. For such cases the split of work is a contractual issue that should be specified at the time of enquiry and order.

A.2 Purchaser provided component specification (PPCS)

In a purchaser provided component specification the purchaser provides the necessary technical information to manufacture the component. The information needs to include specification of all constituent products to be used for all parts of the component. The specification needs also to include all geometrical information needed and the relevant requirements for execution of the work. Any particular requirements for execution need to be given.

The manufacturer’s task in this case is to provide a component that complies with the PPCS and to perform manufacturing in accordance with EN 1090-2 for steel components and EN 1090-3 for aluminium components, and to deliver documentation thereof.

NOTE 1 It is presupposed that the structural design in this case has been performed by the purchaser, and that the structural design is carried out according to provisions in the country where the component shall be used.

NOTE 2 This approach complies with the manufacturer's declaration of performance characteristics according to Method 3a in Guidance Paper L, see ZA.3.

A.3 Manufacturer provided component specification (MPCS)

In a manufacturer provided component specification the manufacturer develops the necessary technical information to manufacture the component and all its parts. In this case there are two options for the content of a declaration of conformity:

Option 1 The manufacturer declares the geometry and the material properties of the component, and any other information needed to enable others to perform a structural design.

NOTE 1 This complies with a declaration of performance characteristics according to Method 1 in Guidance Paper L, see ZA.3.

Option 2 The manufacturer declares the geometry and the material properties of the component and the structural characteristics resulting from design of the component.

NOTE 2 This complies with a declaration of performance characteristics according to Method 2 if the design is carried out according to Eurocode and Method 3b if the design is carried out according to other design provisions specified by the purchaser, see Guidance Paper L and ZA.3

In option 2, it is the manufacturer`s task to provide a component where design and manufacturing are carried out by the manufacturer according to the specified requirements given in a design brief for the component.

The manufacturer needs to be provided with complete information from the purchaser of the parameters required to determine the structural characteristics and any other information needed to be considered for the use of the component. This information is needed for preparation of the design brief which is part of the manufacturer's delivery unless otherwise agreed between the parties. A part of the information is whether characteristic or design values of structural characteristics are to be declared.

For a PPCS as well as a MPCS the manufacturer declares that the manufacturing of the component(s) is in accordance with EN 1090-2 for steel components and EN 1090-3 for aluminium components.

Table A.1 gives a summary of the manufacturer`s tasks and delivery for the various methods for declaration of conformity.

Table A.1 — Manufacturer's declaration of properties of structural components in connection with CE marking, depending on method of declaration.

Activity	**Manufacturers tasks and delivery**			
	Method 1	**Method 2**	**Method 3b**	**Method 3a**
Structural design calculations for the component	**None**	**Yes** Based on a requirement to use a product standard referring to relevant parts of Eurocodes	**Yes** Based on a requirement to use the purchaser`s design brief or the manufacturer's design brief to meet the client's order	**None**
Basis of manufacture	MPCS	MPCS	MPCS	PPCS
Declaration of component properties	Geometrical and material information, and any other information needed, for others to perform structural evaluation and calculations	Delivered components to be in accordance with this European Standard referring to relevant parts of Eurocodes, with resistance(s) given as characteristic value(s) or design value(s)	Delivered component to be in accordance with MPCS, and traceable to purchaser`s order	Delivered component to be in accordance with PPCS

Annex B
(normative)

Assessment of factory production control

B.1 General

This Annex gives the tasks to be performed to assess the FPC system in order to ensure that the FPC is suitable for manufacturing of steel and/or aluminium components in accordance with the requirements of this European Standard.

The tasks are dependant on whether the manufacturer performs a) manufacturing only or b) design and manufacturing. The tasks for both options are related to two assessment activities:

— Initial inspection of both the factory and the factory production control system;

— Continuous surveillance and assessment of the FPC system.

B.2 Initial inspection

The FPC system shall demonstrate that the systems for performing work according to this European Standard are adequate for delivering components that conform to the requirement of this European Standard. The tasks for the initial assessment are related to a check of the systems where specifics for the tasks are given in Table B.1

Table B.1 — Tasks for the initial inspection

Tasks related to structural design work [a]	Tasks related to execution work
General: Evaluation of design resources (premises, personnel and equipment) as being fitted to perform structural design of steel and/or aluminium components covered by this European Standard. In particular this comprises: - Evaluation by samples that relevant equipment and resources e.g. procedures for hand calculations and/or computer equipment and computer programs for the work are available and functional. - Evaluation of job descriptions and requirements to competence of personnel. - Evaluation of procedures for structural design including control procedures to secure that conformity is obtained. The aim of the task is to check that the FPC system for structural design work is adequate and operational.	General: Inspection and evaluation of execution resources (premises, personnel and equipment) as being adequate to manufacture steel and/or aluminium components according to the requirements in EN 1090-2 and EN 1090-3. In particular this comprises: — Inspection and evaluation of the internal control system for checking conformity and procedures for handling any non-conformity. — Evaluation of job descriptions and requirements for competence of personnel. For welding check that the factory and the welding plant meet the requirement for the FPC with regard to equipment and personnel. The welding certificate should include the following information: — scope and the applicable standards; — execution class(es); — welding process(es); — parent material(s); — responsible welding coordinator, see EN ISO 14731; — remarks if any. The aim of the task is to check that the FPC system for manufacturing of load bearing steel and/or aluminium components can meet the requirements of this European Standard.
[a] Only if characteristics influenced by structural design shall be declared.	

B.3 Continuous surveillance

The tasks for the continuous surveillance of the FPC are given in Table B.2

Table B.2 — Tasks for continuous surveillance

Tasks related to structural design [a]	Tasks related to execution work
- Check by sampling that the resources required to perform structural design for the relevant components are present and operational. - Evaluation by samples that relevant equipment and resources e.g. procedures for hand calculations and/or computer equipment and computer programs for the work are operational - Evaluation of procedures for structural design including control procedures to assure that conformity is obtained Confirmation of the FPC system for structural design work	- Check by sampling that the system for monitoring that the requirements to geometry, use of correct constituent products and that the quality levels for the work meet the requirements in EN 1090-2 or EN 1090-3. - Inspection and evaluation of the internal control system for checking conformity and procedures for handling any non-conformity Confirmation of FPC system for manufacturing of load bearing steel and/or aluminium components
[a] Only if characteristics influenced by structural design shall be declared.	

B.4 Frequency of inspection

B.4.1 General

The first surveillance shall be carried out one year after the initial assessment. If no significant corrective actions are needed, the frequency of inspection may be decreased unless one of the following situations arises:

a) new or changed essential facilities;

b) change of responsible welding coordinator;

c) new welding processes, type of parent metal and the associated welding procedure qualification record (WPQR);

d) new essential equipment.

B.4.2 Surveillance intervals

Intervals between inspections and after the initial surveillance shall be as in Table B.3 if none of the situations in B.4.1 a) to d) have occurred:

Table B.3 — Routine surveillance intervals

Execution class	Intervals between inspections of manufacturer's FPC after the ITT (years)
EXC1 and EXC2	1– 2 – 3 – 3
EXC3 and EXC4	1 – 1 – 2 – 3 – 3

B.4.3 Declaration by manufacturer

In periods where the interval between the inspections is 2 or 3 years, the manufacturer shall make a declaration each year that none of the above situations has taken place.

B.4.4 Action in case of non-compliance

In the case of a major non compliance and after correction of the non-conformity, the frequencies for assessment shall revert to the regime following initial surveillance where the provisions given in Table B.3 again apply.

NOTE EN ISO 19011 gives guidelines for quality management systems auditing.

B.5 Reports

After each inspection a confidential draft report shall be prepared and sent to the person named as responsible for FPC. The manufacturer shall have the opportunity to give his comments on the report.

Any corrective actions taken or planned as a follow up activity from the draft report shall be monitored and reviewed at a subsequent inspection.

After having received the manufacturer's response, a final assessment and report shall be prepared.

Annex ZA
(informative)

Clauses of this European Standard Addressing the provisions of EU Construction Products Directive (CPD)

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under the Mandate M 120 - Structural Metallic Products and Ancillaries given to CEN by the European Commission and the European Free Trade Association.

The Clauses of this European Standard shown in this Annex meet the requirements of the Mandate given under the EU Construction Products Directive (89/106/EEC).

〉A1〈 Compliance with these Clauses confers a presumption of fitness of the structural components covered by this Annex for their intended uses indicated herein; reference shall be made to the information accompanying the CE marking. 〉A1〈

〉A1〈 *Deleted text* 〉A1〈

> WARNING: Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the structural components falling within the scope of this European Standard.

〉A1〈 NOTE 1 〉A1〈 In addition to any specific Clauses relating to dangerous substances contained in this Standard, 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 EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

〉A1〈 NOTE 2 〉A1〈 An informative database of European and national provisions on dangerous substances is available at the Commission's CIRCA site "dangerous substances" (accessed through the responsible unit: entrconstruction@ec.europa.eu).

This Annex establishes the conditions for the CE marking of structural metallic construction components intended for the use in steel and aluminium structures or in composite steel and concrete structures, where the components can be made from hot rolled, cold-formed or with other technologies produced sections/profiles with various shapes, flat products (plates, sheet, strip), bars, castings, forgings made of steel and aluminium materials.

This Annex has the same scope as Clause 1 of this European Standard.

Table ZA.1 shows the requirements for the performance characteristics of components and kits of steel and aluminium for building and civil engineering works.

Table ZA.1 – Clauses where the performance characteristics are dealt with

ER [a]	Performance characteristic	Requirement Clause	Levels or classes	Notes
1	Tolerances on dimensions and shape	4.2, 5.3		Tolerances to be declared according to the limits for essential tolerances in EN 1090-2 or EN 1090-3
1	Weldability	4.3, 5.4		This characteristic is declared by reference to the constituent materials, and their EN standard(s)
1	Fracture toughness, Impact resistance	4.4, 5.5 4.8, 5.10		For steel components the fracture toughness value may be obtained through the impact energy in a Charpy notch test, according to EN 1993-1-10. For aluminium component declaration of this characteristic is not required
1	Load bearing capacity [b]	4.5.1, 4.5.2, 5.6.2		This characteristic may be declared according to the method given in ZA.3.3. Execution classes to be specified in accordance with EN 1090-2 or EN 1090-3
A1 1	Deformation at serviceability limit state [b]	4.5.5		This characteristic may be declared according to the method given in ZA.3.3. A1
1	Fatigue strength [b]	4.5.1, 4.5.3, 5.6.2		This characteristic may be declared according to the method given in ZA.3.3. Execution classes to be specified in accordance with EN 1090-2 or EN 1090-3
2	Resistance to fire [b]	4.5.1, 4.5.4, 5.7		This characteristic may be declared according to the method given in ZA.3.3 (R, E, I and/or M and the required classification)
2	Reaction to fire	4.6, 5.8		Class A1 for uncoated components. For coated components classification according to EN 13501-1 by class. In this context anodizing and galvanizing is not considered as coating
3	Release of cadmium and its compounds	4.7, 5.9		This characteristic is declared by reference to the EN standard for the constituent products used.
3	Emission of radioactivity	4.7, 5.9		This characteristic is declared by reference to the EN standard for the constituent products used.
	Durability	4.9, 5.11		The characteristic to be declared in accordance with the requirements in the component specification

[a] ER = Essential requirements, see CPD

[b] These performance characteristics are defined as structural characteristics

The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the component. In this case, manufacturers placing their products on the markets of these MSs are not obliged to determine nor declare the performance of their components with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (See ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.

No threshold values apply to the performance characteristics listed in Table ZA.1 except where performance characteristics are declared using the properties of constituent products which are based on threshold values e.g. weldability and fracture toughness for steel components.

ZA.2 Procedures for the attestation of conformity of structural steel and aluminium components

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of Mandate M/120 II) "Structural metallic products and ancillaries" indicated in Table ZA.1 in accordance with the Decision of the Commission 98/214/EC amended by 01/596/EC as given in Annex 3 of the mandate for "Structural metallic construction members", is shown in Table ZA.2 for the indicated intended use(s).

Table ZA.2 — System of attestation of conformity for steel and aluminium structural components

Product	Intended use	Level(s) or class(s)	Attestation of conformity system
Steel and aluminium structural components	For structural use in all types of construction works		2+
System 2+: See CPD Annex III.2 (ii). First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control.			

ZA.2.2 Assignment of tasks

The assignment of tasks for evaluation of conformity of structural steel and aluminium components is given in Table ZA.3.

Table ZA.3 — Assignment of tasks for evaluation of conformity of structural steel and aluminium components

Tasks			Content of the task	Evaluation of conformity Clauses to apply
Tasks under the responsibility of the manufacturer	Initial type testing		Relevant parameters related to the performance characteristics of Table ZA.1	6.2
	Factory Production Control (FPC)		Relevant parameters related to the performance characteristics of Table ZA.1	6.3
	Sampling, testing and inspection at the factory		Relevant characteristics of Table ZA.1	Table 2
Tasks for the certification body	Certification of FPC by a certified body on the basis of:	Initial inspection of factory and of FPC	Relevant parameters related to the characteristics of Table ZA.1	6.3 and Annex B
		Continuous surveillance, assessment and approval of FPC	Relevant parameters related to the characteristics of Table ZA.1	6.3 and Annex B

ZA.2.3 Declaration of conformity

Where compliance with the conditions of this Annex is achieved, and the notified body has drawn up the certificate mentioned below, the manufacturer or his agent established in the European Economic Area (EEA), shall prepare and retain a declaration of conformity, which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and the place of production:

NOTE The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the component (type, identification, use, etc.) and a copy of the information accompanying the CE marking, see ZA.3;

NOTE If some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (e.g. Annex ZA of this European Standard);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);

— the number of the accompanying factory production control certificate;

— name and position held by the person empowered to sign the declaration on behalf of the manufacturer.

The above mentioned declaration and certificate shall be accompanied by a factory production control certificate, drawn up by the notified body, which shall contain, in addition to the information above, the following:

— name and address of the notified body;

— the number of the factory production control certificate;

— conditions and period of validity of the certificate, where applicable;

— name of, and position held by, the person empowered to sign the certificate.

Made available upon request and presented in the language(s) acceptable to the member state in which the product is to be used.

ZA.3 CE marking and labelling

ZA.3.1 General

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol affix shall be in accordance with directive 93/68/EC and shall be shown on the component or may be on the accompanying label, the packaging or on the commercial documentation.

The following information shall be added to the CE marking symbol:

— identification number of the certification body for the FPC;

— name or identifying mark and registered address of the manufacturer;

— the last two digits of the year in which the marking is affixed;

— number of the EC factory production control certificate;

— reference to this European Standard;

— description of the components; generic name, materials, dimensions and intended use;

— information on those relevant essential characteristics taken from Table ZA.1 which are listed in the relevant Clause ZA.3.2, ZA.3.3 or ZA.3.4;

— “No performance determined" for characteristics where this is relevant;

— the execution class of the component referring either to EN 1090-2 or EN 1090-3;

— reference to the component specification.

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

ZA.3.2 Declaration of product properties by material properties and geometrical data

All data that are needed, according to design regulations in the place of use of the component, to determine the structural characteristics of the component shall be declared.

Referring to Table ZA.1 and the information quoted in the list of ZA.3.1, the following properties shall be declared:

— geometrical data (tolerances in dimensions and shape);

— weldability – If required, if not NPD may be declared;

— fracture toughness of structural steel products;

— reaction to fire – To be declared that the materials are classified as Class A1; or if a coating with organic content larger than 1 %, the relevant class of the organic content;

— release of cadmium and its compounds –"NPD" to be declared;

— emission of radioactivity – "NPD" to be declared;

— durability – To be declared according to component specification;

— execution class (EXC);

— reference to component specification.

A unique mark shall be used to identify the component and trace it back to its component specification and manufacturing information. (In the examples "M" is used as a prefix for the mark)

Figures ZA.1 and ZA.2 give a model for CE marking in a case where the parameters are given that are needed to determine the properties related to mechanical resistance and stability and resistance to fire, as well as information needed to evaluate its durability and serviceability properties, according to design regulations in the place of use of the component.

NOTE This method for declaration of the component properties complies with Method 1 in Guidance Paper L.

CE 01234	*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.* *Identification number of the notified body*
AnyCo Ltd, PO Box 21, B-1050 11 01234-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year in which the marking was affixed* *Certificate number*
EN 1090-1:2009+A1:2011 Welded steel beam – M 346 **Tolerances on geometrical data: EN 1090-2.** **Weldability: Steel S235J0 according to EN 10025-2.** **Fracture toughness: 27 J at 0°C.** **Reaction to fire: Material classified: Class A1.** **Release of cadmium: NPD.** **Emission of radioactivity: NPD.** **Durability: Surface preparation according to EN 1090-2, preparation grade P3. Surface painted according to EN ISO 12944-5, S.1.09.** **Structural characteristics:** **Design: NPD.** **Manufacturing: According to component specification CS-034/2006, and EN 1090-2, execution class EXC2.**	*No. of European standard* *Description of product* *and* *information on regulated characteristics*

Figure ZA.1 – Example of CE marking information of product properties by material properties and geometrical data

CE 01234	*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.* *Identification number of the notified body*
Any Co Ltd, PO Box 21, B-1050 11 01234-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year in which the marking was affixed* *Certificate number*
EN 1090-1:2009+A1:2011 Welded aluminium beam - M 196 **Tolerances on geometrical data: EN 1090-3.** **Weldability: EN AW-6082 T6 and EN AW - 5083 O according to EN 1011-4 and EN 1999-1-1.** **Fracture toughness: Not required for aluminium products.** **Reaction to fire : Material classified: Class A1** **Release of cadmium: NPD.** **Emission of radioactivity: NPD.** **Durability: Uncoated, NPD.** **Structural characteristics:** **Design: NPD.** **Manufacturing: According to component specification CS-A42/2006, and EN 1090-3, execution class EXC3.**	*No. of European standard* *Description of product* *and* *information on regulated characteristics*

Figure ZA.2 – Example of CE marking information of product properties by material properties and geometrical data

ZA.3.3 Declaration of the strength value(s) of the component

According to this method the declaration shall encompass the mechanical resistance of the component, determined according to the European Standards for design of structures - Eurocodes, referring to one or more specified load situations given in the design brief/design calculations. Referring to Table ZA.1 and the information listed in ZA.3.1, the following properties shall be covered by the declaration:

— geometrical data (tolerances on dimensions and shape);

— weldability – If required, if not NPD may be declared;

— fracture toughness of structural steel products;

— reaction to fire – To be declared that the materials are classified as Class A1; or if a coating with organic content larger than 1 %, the relevant class of the organic content;

— release of cadmium and its compounds –"NPD" to be declared;

— emission of radioactivity - "NPD" to be declared;

— durability – To be declared according to the component specification.

Structural characteristics:

— load bearing capacity;

— ▌A1⟩ deformation at serviceability limit state; ⟨A1▐

— fatigue resistance;

— resistance to fire;

— design: reference to the design calculations and the use of the Nationally Determined Parameters for the relevant Eurocodes;

— manufacturing: Reference to the component specification and the relevant part of EN 1090, including the execution class (EXC) applied.

The values of the structural characteristics may be the characteristic values or the design values.

NOTE 1 The structural characteristics are either all to be based on characteristic values or all on design values in accordance with the definitions for those terms given in the relevant Eurocodes. The design method may be based on the Eurocode using either the values recommended for NDPs in the Eurocodes, or the NDPs from the national Annex relevant to the intended market location. The record of the assessment should state in its title which basis and which National Annexes have been used as appropriate. If the structural characteristics are assessed by calculations, the calculations shall all be based on a consistent set of design standards.

NOTE 2 The method of declaration the components properties using the Eurocodes complies with Method 2 in Guidance Paper L. For use of other design provisions than the Eurocodes Method 3b applies.

NOTE 3 A component's characteristics can be declared in two ways using Method 2. The first version is shown in Figure ZA.2 and applies to those components that are designed according to Eurocodes and whose erection location is known, designated option 2a. The second option applies to those components that are designed according to the Eurocodes and whose erection location is unknown, designated option 2b (no example shown).

A unique mark should be used to identify the component and trace it back to its component specification and manufacturing information. (In the examples "M" is used as a prefix for the mark.)

Figure ZA.3 gives a model for CE marking in a case where the parameters related to mechanical resistance and resistance to fire are determined by the use of Eurocodes. This is an example of option 2a of Method 2.

CE

01234

Any Co Ltd, PO Box 21, B-1050

A1 11 A1

01234-CPD-00234

A1 EN 1090-1:2009+A1:2011 A1

Roof trusses in steel, to be used in the new library in Berlin - M 201

Tolerances on geometrical data: EN 1090-2.

Weldability: S235J0 according to EN 10025-2.

Fracture toughness: 27 Joule at 0°C.

Reaction to fire: Material classified: Class A1.

Release of cadmium: NPD.

Emission of radioactivity: NPD.

Durability: Surface preparation according EN 1090-2, Preparation grade P3. Surface painted according to EN ISO 12944, see component specification for details.

Structural characteristics:
Load bearing capacity: Design according to EN 1993-1, see accompanying design brief and design calculations. NDPs for Germany apply. Reference: DC 102/3.
A1 Deformation at serviceability limit state: NPD A1
Fatigue strength: NPD.
Resistance to fire: Calculated value: R 30, see DC 102/3.
Manufacturing: According to component specification CS—0016/2006, and EN 1090-2, EXC3.

CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.

Identification number of the notified body

Name or identifying mark and registered address of the producer

Last two digits of the year in which the marking was affixed

Certificate number

No. of European standard

Description of product

and

information on regulated characteristics

Figure ZA.3 – Example CE marking information by strength values of the component

ZA.3.4 Declaration of compliance with a given component specification

According to this method the declaration shall encompass the situation where the component is designed by others than the manufacturer. Requirements to the manufacturing of the component are identified by the component specification which is based on information from the design of the component. The component specification is prepared by the purchaser or by the purchaser in cooperation with the manufacturer.

Referring to Table ZA.1 and the information listed in ZA.3.1, the following properties shall be covered by the declaration:

— geometrical data (tolerances on dimensions and shape);

— weldability– If required, if not NPD may be declared;

— fracture toughness of structural steel products;

— reaction to fire - To be declared that the materials are classified as Class A1; or if a coating with organic content larger than 1 %, the relevant class of the organic content;

— release of cadmium and its compounds – "NPD" to be declared;

— emission of radioactivity. "NPD" to be declared;

— structural characteristics:

  * reference to the design by others (purchaser);

  * manufacturing: Reference to component specification and the relevant part of EN 1090, including the execution class (EXC) applied.

A unique mark should be used to identify the component and trace it back to its component specification and manufacturing information. (In the examples "M" is used as a prefix for the mark.)

Figure ZA.4 gives a model for CE marking in a case where the parameters related to mechanical resistance and resistance to fire are determined by others than the manufacturer and where the properties related to mechanical resistance and stability and resistance to fire are determined in accordance with requirements applicable to the works in the place of use of the component.

NOTE This method for declaration of the components properties complies with Method 3a in Guidance Paper L.

CE 0123	*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.* *Identification number of the notified body*
Any Co Ltd, PO Box 21, B-1050 A1 11 A1 01234-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year in which the marking was affixed* *Certificate number*
A1 EN 1090-1:2009+A1:2011 A1 Aluminium panels, to be used in the "New National Theatre, Luxembourg City – M 106 **Tolerances on geometrical data: EN 1090-3.** **Weldability: EN AW-6082 T6 and EN AW - 5083 O_f according to EN 1011-4 and EN 1999-1-1.** **Fracture toughness: Not required for aluminium components.** **Load bearing capacity: NPD.** **Fatigue strength: NPD.** **Resistance to fire: NPD.** **Reaction to fire: Material classified: Class A1.** **Release of cadmium: NPD.** **Emission of radioactivity: NPD.** **Durability: Uncoated, NPD.** **Structural characteristics:** **Design: Provided by purchaser, doc. Ref. no 123.** **Manufacturing: According to component specification CS-M202, and EN 1090-3, execution class EXC2.**	*No. of European standard* *Description of product* *and* *information on regulated characteristics*

Figure ZA.4 – Example CE marking information for components manufactured according to a given Component Specification

ZA.3.5 Declaration of the strength value(s) of the component from purchaser`s order

According to this method the declaration shall encompass the mechanical resistance of the component, determined according to the purchaser`s order, referring to the design brief. Referring to Table ZA.1 and the information listed in ZA.3.1, the following properties shall be covered by the declaration:

— geometrical data (tolerances on dimensions and shape);

— weldability – If required, if not NPD may be declared;

— fracture toughness of structural steel products;

— reaction to fire – To be declared that the materials are classified as Class A1; or if a coating with organic content larger than 1 %, the relevant class of the organic content;

— release of cadmium and its compounds – "NPD" to be declared;

— emission of radioactivity - "NPD" to be declared;

— durability – To be declared according to purchaser`s order and stated in the component specification.

Structural characteristics:

— design brief, standards and any other design specifications;

— load bearing capacity;

— ▌A1⟩ deformation at serviceability limit state; ⟨A1▐

— fatigue resistance;

— resistance to fire;

— reference to the design calculations;

— manufacturing: Reference to the component specification and the relevant part of EN 1090, including the execution class (EXC) applied.

The values of the structural characteristics may be the characteristic values or the design values.

NOTE 1 The structural characteristics are either all be based on characteristic values or all on design values in accordance with the definitions for those terms given in the relevant design provisions. If the structural characteristics are assessed by calculations, the calculations are to be based on a constituent set of design standards.

NOTE 2 The method of declaration the components properties using this method complies with Method 3b in Guidance Paper L.

A unique mark should be used to identify the component and trace it back to its component specification and manufacturing information. (In the examples "M" is used as a prefix for the mark.)

Figure ZA.5 gives a model for CE marking in a case where the parameters related to mechanical resistance and resistance to fire are determined by the use of National provisions.

CE 01234	*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.* *Identification number of the notified body*
Any Co Ltd, PO Box 21, B-1050 A1 11 A1 01234-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year in which the marking was affixed* *Certificate number*
A1 EN 1090-1:2009+A1:2011 A1 4 Welded steel beams for bridge Bergen - M 314 **Tolerances on geometrical data: EN 1090-2.** **Weldability: S235J0 according to EN 10025-2.** **Fracture toughness: 27 Joule at 0°C.** **Reaction to fire: Material classified: Class A1.** **Release of cadmium: NPD.** **Emission of radioactivity: NPD.** **Durability: Surface preparation according EN 1090-2, Preparation grade P3. Surface painted according to EN ISO 12944, see component specification for details.** **Structural characteristics:** **Load bearing capacity: Design according to NS 3472 and specification RW 302 from the Railway administration, see accompanying design brief and design calculations, DC 501/06** **A1 Deformation at serviceability limit state: See accompanying design brief and design calculations**. DC 501/06 A1 **Fatigue strength: RW 302** **Resistance to fire: NPD** **Manufacturing: According to component specification CS-506/2006, and EN 1090-2. EXC3**	*No. of European standard* *Description of product* *and* *information on regulated characteristics*

Figure ZA.5 – Example CE marking information by strength values of the component declared by the manufacturer based on purchaser`s order

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