

## Introduction to CE marking for EN1090

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As of the 1st July 2014, CE Marking of structural steel and aluminium work for use in construction, as specified in EN 1090 became mandatory under the Construction Products Regulation.

The scope of EN 1090 is very broad, it includes:

- Structural steel and aluminium components
  - Fabrications and kits of parts manufactured from steel and aluminium
  - Steel components used in composite steel and concrete structures
- that are intended for permanent use in buildings, bridges, highways and other civil engineering structures.

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

It does not cover components for suspended ceilings and rails or sleepers for use in railway systems.

EN 1090 consists of the following three sections:

Part 1: Requirements for conformity assessment of structural components

(Details of all the individual requirements, which must be achieved in order to CE mark. Different levels of stringency are given depending on the execution class.)

Part 2: Technical requirements for steel structures

Part 3: Technical requirements for aluminium structures

Support the application of Part 1 by providing the technical requirements relevant to the manufacture of steel and aluminium components respectively.

In relation to CE Marking, the relevant clauses of the standard are:

1. Scope
2. Normative references
3. Terms and definitions
4. Specifications and documentation
5. Constituent products
6. Preparation and assembly
7. Welding

8. Mechanical fastening
9. Surface treatment
10. Geometrical tolerances
11. Inspection, testing and correction.

If all you do is to make components following your customers' specification, you are not required to demonstrate that the design of the component is adequate, merely that you can reliably manufacture the item specified. For more details please see following "component specification".

## Component Specification (Your Product) Guidelines for preparation

There are four categories, which cover the specification of a product or kit in relation to its declared structural characteristics. Basically these categories are for indicating how the structural properties of the product have been derived. These categories will appear on the CE data label.

MPCS – Manufacturer Provided Component Specification

PPCS – Purchaser Provided Component Specification

Method 1 using MPCS Option 1 – Manufacturer produces product/kit and only declares the geometry and the material properties of the component. (no structural data used/given). The manufacturer provides no warranty with respect to design work.

Method 2 using MPCS Option 2 – Manufacturer produces product/kit based on own structural design/calculations using appropriate Eurocodes. These characteristics shall be given in the DoP. The manufacturer includes a warranty with respect to design work it has undertaken.

Method 3b using MPCS Option 2 – Manufacturer produces product/kit using structural designs and calculations agreed with the purchaser. These design characteristics shall be given in the DoP.

Method 3a using PPCS – Manufacturer produces product/kit in accordance with purchaser's specification. Manufacturer undertakes no design works.

## An Understanding of Execution Classes

The standard employs a system for deriving reliability against failure requirements matched to the consequences of failure of a structure. Four execution classes are given, for which requirement level and strictness increase from EXC1 to EXC4. Throughout the standard these classes are used to categorise levels of significance for each requirement. EXC Classification is derived through a multi stage process including:

- Assessing the potential risk of economic and environmental impact and loss of human life
- Risk from actions to which the structure is likely to be exposed to during erection and use, such as fatigue and seismic actions.
- Production methods and steel grades.

A simplified application of the execution classes for UK structures could be:

- EXC1 – Small storage buildings.
- EXC2 – Majority of buildings in UK
- EXC3 – Bridges & structures subject to fatigue
- EXC4 – Long span bridges, Stadia.

Lower level of requirement



Higher level of requirement

EN 1090 provides the following useful comments:

If no execution class is specified EXC2 shall apply.

It appears likely that for most steel structures in the UK the default classes could be:

EXC2 for structures/components/details used in buildings and

EXC3 for structures/components details used in bridges.

## Constituent Parts – Materials and Parts

The scope of BS EN 1090-1 acknowledges that the fabrication of structural steelwork is an assembly process that uses constituent products such as steel sections, fasteners and welding consumables. The standard requires that all these raw materials and bought out parts should conform to individually referenced harmonised product standards (where available), therefore removing any doubt from purchasing and also the safety and quality of the finished product.

## Welding Requirements

If welding is undertaken as a manufacturing process in production of the component then EN 1090 requires certain criteria be met.

- General quality requirements are referenced to, at differing levels dependent on Execution classes
- A welding plan be created and maintained
- Qualification of Welding procedures and personnel must be in accordance with referenced standards.
- A certified Responsible Welding Coordinator must be named and maintained.

## AVCP System and Notified body involvement

AVCP stands for 'Attestation and Verification of Constancy of Performance'.

In normal terms this section of an individual hEN categorises and specifies the level of third party involvement (Notified Body) with product testing and control of manufacturing.

EN 1090 has been assigned AVCP system 2+, which means that the manufacturer should operate and control the manufacturing process effectively and that it should be documented (the standard refers to this as Factory Production Control – see below) and that a Notified Body is required to audit, certify and carry out on-going surveillance and certification.

As far as structural testing (or calculation) is involved there is no requirement for Notified Body involvement although as part of the FPC audit, a NB will review inclusion of data to ensure it is complete and valid but not actually confirm structural calculations or testing results.

## Factory Production Control (FPC)

This is a documented system to ensure that products placed on the market conform to the declared performance characteristics. It should consist of procedures, inspections and tests, to control all aspects of manufacture, from checking incoming goods to signing off the finished product. This is a relatively simple document, which could be incorporated into an existing EN ISO 9001 system if required (although the FPC is not required to be in accordance with EN ISO 9001).

For EN1090 the FPC should consist of the following sections (where required):

- \* Personnel
- \* Equipment
- \* Structural Design Process
- \* Raw materials and components
- \* Production Process
- \* Traceability and Marking
- \* Non-conforming products
- \* Corrective action

## CE Marking

Upon successful completion of the requirements detailed in the standard applicable to your product, the final task is to write your Declaration of Performance and complete the CE Marking label. Both of these items are simple to create, as you will have gathered all the necessary information whilst working through the subjects listed above.

There exists large amounts of helpful information on the internet including CE labels and Declaration of Performance (DoP) templates, please follow this link to information available [on our website](#).

Conformance Limited is also able to provide assistance for your business from answering your questions over the phone to full support through the whole process.

If you have an enquiry or would like further information please [contact us here](#).

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