



Understanding Compliance in Structural Steel Works

The Clarion Liffey Valley, Dublin 22 on Thursday 23rd April 2015.

Implications of EN 1090 for the steel industry

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Implications of EN 1090 for the steel industry

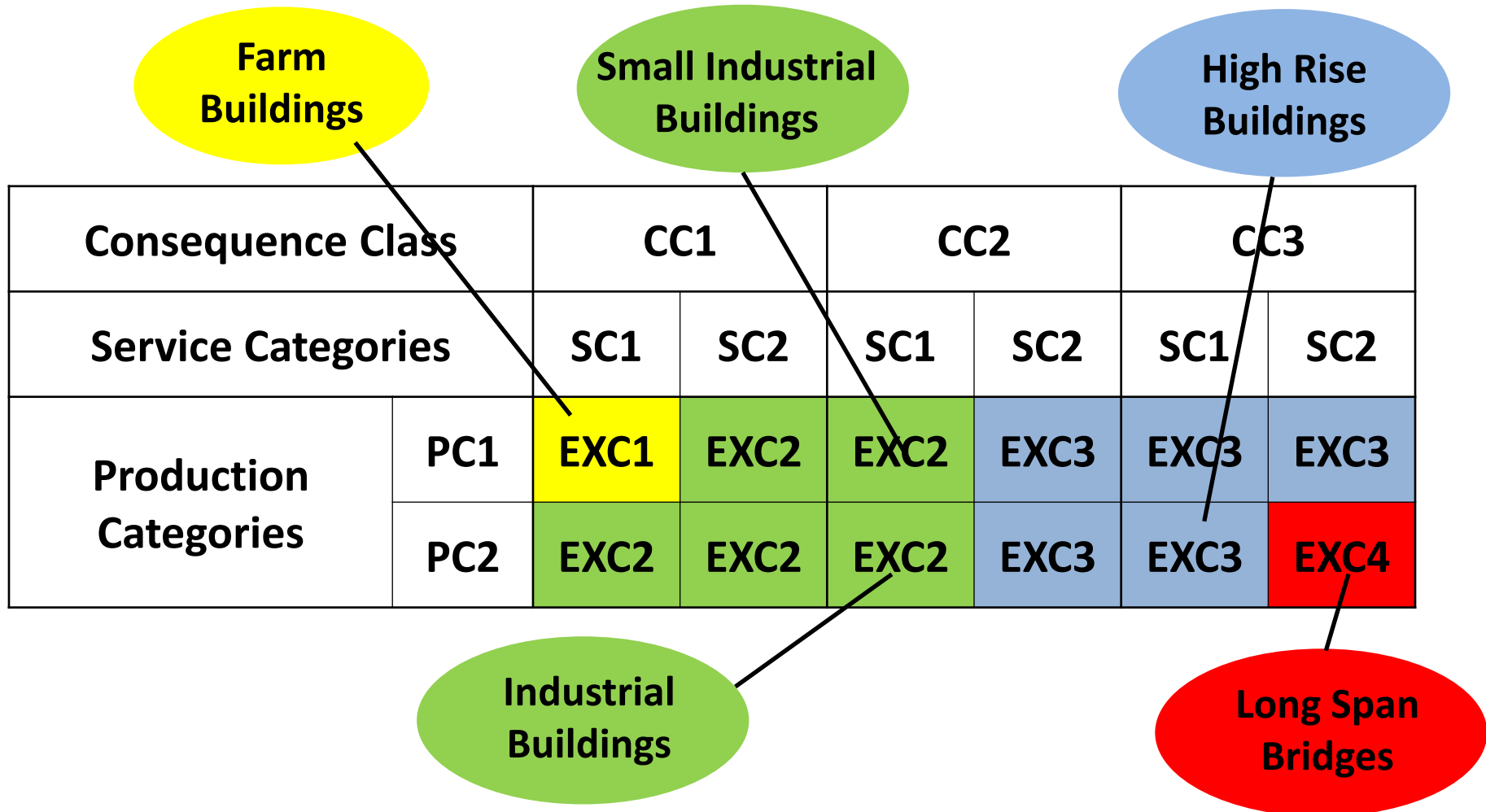
- CE Marking of structural steelwork became a legal requirement in Ireland on **1st July 2014!**
- It has now become a **criminal offence** to supply structural steelwork unless it carries a legitimate CE mark.



Implications of EN 1090 for the steel industry

- For any project, the required quality of fabrication or the Execution Class must be specified.
- The responsibility for deriving the execution class lies with the **Designer/Engineer/Client (Not the Fabricator!)**.
- There are 4 Execution Classes (EXC) which range from Execution Class 1 which is the least onerous through to Execution Class 4 which is the most onerous.

Implications of EN 1090 for the steel industry



Implications of EN 1090 for the steel industry

- Whilst each building needs to be considered on its own merits, Execution Class 2 (EXC2) will be appropriate for the majority of buildings constructed in Ireland.

Consequence Class		CC1		CC2		CC3	
Service Categories		SC1	SC2	SC1	SC2	SC1	SC2
Production Categories	PC1	EXC1	EXC2	EXC2	EXC3	EXC3	EXC3
	PC2	EXC2	EXC2	EXC2	EXC3	EXC3	EXC4



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- In order for a manufacturer to CE mark their products, they will have to set up a Factory Production Control system be certified by a notified body.

Implications of EN 1090 for the steel industry

Issues to be considered:

- What existing Quality Management is in operation:
 - ISO 9001
 - ISO 3834
 - None

Implications of EN 1090 for the steel industry

Issues to be considered:

- What products are manufactured:
 - Farm Buildings
 - Stairs & Balconies
 - Industrial Buildings
 - Stadia
 - Bridges

Implications of EN 1090 for the steel industry

Issues to be considered:

- Personnel need to be competent & capable:
 - Experience
 - Qualifications
 - Certified
 - Application of above

Implications of EN 1090 for the steel industry

Factory Production Control (FPC):

- The manufacturer shall establish, document and maintain a factory production control (FPC) system
- The system shall consist of written procedures, regular inspections, tests and / or assessments
- A quality system conforming to ISO 9001 satisfies most but not all of the requirements for FPC
- ISO 9001 is not a mandatory requirement for FPC but it helps

Implications of EN 1090 for the steel industry

Factory Production Control (FPC) :

➤ **Personnel**

- Demonstrate competency (by application), responsibility & authority

➤ **Equipment**

- Calibrated, inspected & maintained with supporting records

➤ **Design Process**

- Identify procedures for checking and provide detailed records

Implications of EN 1090 for the steel industry

Factory Production Control (FPC) :

➤ **Constituent Products**

- Conform to specification, are traceable and records kept

➤ **Component Specification**

- Fabrication Drawings, prepared from design information, written inspection / test plan to check conformity

Implications of EN 1090 for the steel industry

Factory Production Control (FPC) :

➤ **Product Evaluation**

- Requires Procedures to ensure characteristics are maintained, specified sampling methods given in EN 1090-1, Table 2

➤ **Non-Conforming Product**

- Requires written procedures specifying how they're dealt with, recorded and kept

Implications of EN 1090 for the steel industry

Welding Quality Management System (ISO 3834):

- **Welding is a so-called “special” process**
 - Means that you cannot make a complete verification of the welded joint without destroying it.
 - To examine the mechanical properties, you have to take samples from the welded product.
 - Therefore you have to build quality in from the beginning.

Implications of EN 1090 for the steel industry

Welding Quality Management System (ISO 3834):

➤ **ISO 3834, Quality Requirements for Fusion Welding of Metallic Materials**

- is a specification that was first published as an EN specification almost 20 years ago.
- Not being a mandatory specification it has, to a large extent, been ignored by welding fabricators who have adopted the attitude that they will implement the requirements when they have to.

Implications of EN 1090 for the steel industry

Welding Quality Management System

- **Clause 5 Requirements review and technical review**
 - The overall intent is to ensure that the manufacturer properly understands the technical requirements and that the product can be manufactured in accordance with the contract.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 6 Sub-contracting**

- The manufacturer should ensure that any sub-contracted welding-related activities comply with the requirements of the contract specification to the satisfaction of the welding coordinator with assigned responsibilities in this area.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 7 Welding Personnel**

- Welders and welding operators shall be qualified by an appropriate test.
- The manufacturer shall have at his disposal appropriate welding coordination personnel.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 8 Inspection & Testing Personnel**

- The non-destructive testing personnel shall be qualified.
- For visual testing, a qualification test may not be required.
- When a qualification test is not required, competence shall be verified by the manufacturer.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 9 Equipment**

- ISO 3834 requires that a list of key equipment and facilities be prepared and maintained up-to-date.
- It is expected that the manufacturer will have implemented a system for the maintenance and calibration of all production equipment.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 10 Welding & related activities**

- The manufacturer shall prepare welding-procedure specification(s) and shall ensure that these are used correctly in production.
- Welding procedures shall be qualified prior to production.
- The method of qualification shall be in accordance with relevant product standards or as stated in the specification.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 11 Welding consumables**

- The manufacturer shall produce and implement procedures for storage, handling, identification and use of welding consumables.

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 12 Storage of parent materials**

- Storage shall be such that the material, including material supplied by the client, will not be adversely affected.
- **Identification shall be maintained during storage.**

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 14 Welding related inspection and testing**

- Inspection and testing before welding, during and after welding
- After welding, the compliance with relevant acceptance criteria shall be checked:
 - by visual inspection;
 - by non-destructive testing;
 - by destructive testing;
 - form, shape and dimensions of the construction;

Implications of EN 1090 for the steel industry

Welding Quality Management System

➤ **Clause 15 Non-conformance & corrective action**

- Measures shall be implemented to control items or activities which do not conform to specified requirements in order to prevent their inadvertent acceptance.

Implications of EN 1090 for the steel industry

Welding Quality Management System

- **Clause 16 Calibration and validation of measuring, inspection and testing equipment**
 - Calibration is the process whereby the item of equipment is tested at intervals against measurement standards whose accuracy in terms of closeness of agreement to the true measurement is known.
 - Validation, in the context of measuring equipment, is the process of demonstrating that individual measurements are satisfactory.

Implications of EN 1090 for the steel industry

Welding Quality Management System

- **Clause 17 Identification and traceability**
 - ISO 3834 does not always require identification and traceability.
 - Where the manufacturer has taken on, or is likely to take on, contracts where traceability is required, an appropriate instruction is to be implemented.
 - Identification and traceability shall be maintained throughout the manufacturing process, if required.

Implications of EN 1090 for the steel industry

Welding Quality Management System

- **Clause 18 Quality records**
 - Requirements for records should be identified at the requirement/technical review.
 - A procedure is required for controlling data that must be collected, verifying it and collating it.
 - Procedure should incorporate data and records required from subcontractors.



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Current Situation

Implications of EN 1090 for the steel industry

As of 11th April 2015

- 12 Companies Certified on NSAI Website
- 17 Companies certified on SCCS Website
- Other Notified bodies ????
- **Uncertified fabricators (> 100's)**

Implications of EN 1090 for the steel industry

Why are so many fabricators still uncertified?

- Lack of knowledge of CE marking
- Lack of knowledge of EN 1090 requirements
- Engineers & Contractors not demanding Certification
- Cost of implementing factory production control
- Lack of surveillance of regulations/specifications

Implications of EN 1090 for the steel industry

Lack of knowledge of CE marking

- Some sectors of the industry are not aware of the mandatory requirements of CE marking
- Some sectors are not sure what is included in the scope of CE marking regulations
- Some Engineers and builders are not aware of their responsibilities under the regulations

Implications of EN 1090 for the steel industry

Lack of knowledge of EN 1090 requirements

- EN 1090-1, 46 Pages
- EN 1090-2, 214 Pages
- EN 1090-2 refers to 100's of other standards
- ISO 3834 has 6 parts
- Some small fabricators may not have technical expertise to interpret what is required

Implications of EN 1090 for the steel industry

Engineers & Contractors not demanding Certification

- Some engineers and builders are not aware of the implications of using uncertified manufacturers
- Some engineers and builders accept if the manufacturer is ‘working towards’ getting certified
- Some engineers and builders are not aware of CE marking

Implications of EN 1090 for the steel industry

Cost of implementing factory production control

- Welder qualifications
- Weld Procedure Qualification Tests
- Responsible Welding Coordinator
- Visual Weld Inspection
- Develop & implement written procedures
- Certification audit

Implications of EN 1090 for the steel industry

Lack of surveillance of regulations

- Why spend the money if the regulation won't be policed
- Most engineers and builders do not perform any surveillance to check for compliance
- Building control officers have not carried out any surveillance of the regulations and are unlikely to do so

Implications of EN 1090 for the steel industry

How can compliance with the regulations be ensured?

- Clients should only engage certified steelwork contractor
- Project specifications for steelwork need to be updated to comply with the requirements of EN 1090
- Engineers and builders should perform surveillance to check for compliance with specification
- **(Certification to EN 1090 \neq Compliance with specification)**



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Clients should only engage certified steelwork contractor

**EC Certificate
of
Factory Production Control (FPC)**

2273 – CPR – 0046

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR) it has been stated that the construction product:

Structural Components for Steel Structures

Harmonised	Type / Execution Class of the Construction Product	Declaration Method
BS EN 1090-1: 2009 + A1:2011	Load bearing and welded structural steel components up to EXC 4 according to BS EN 1090-2:2008+A1:2011	1, 2, 3a and 3b table A.1 of BS EN 1090-1: 2009 + A1:2011

placed on the market by

Jamestown Cladding and Profiling Ltd

and produced in the factory(ies)

Unit 20, Newbridge Ind Estate, Newbridge, County Kildare, Ireland

is submitted by the manufacturer to the initial type-testing of the product, a factory production control and to the further testing of samples taken at the factory in accordance with a prescribed test plan and that the notified body No. 2273 – Steel Construction Certification Scheme Ltd - has performed the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control.

Attestation This certificate attests that all provisions concerning the attestation of factory production control described in Annex ZA of the standard: **BS EN 1090-1: 2009 + A1:2011** were applied.

Date of first issue May 2013

Date of this issue 20th May 2013

Date of next Surveillance by 30th April 2014

Validity Period This certificate remains valid as long as the conditions laid down in the harmonised standard in reference or the manufacturing conditions in the factory or the FPC itself are not modified significantly.

Chairman: D Woodward *[Signature]* **Scheme Manager:** J Carmichael *[Signature]*

Welding Certificate

2273 – CPR – 0046 – WC

In compliance with BS EN 1090-1:2009+A1:2011, table B.1, the following has been stated:
This Welding Certificate is an annex to the EC-Certificate of the Factory Production Control (FPC) 2273 – CPR – 0046.
This Welding Certificate is only valid in conjunction with the aforementioned EC-Certificate in the scope of the Construction Products Regulation or CPR.

Manufacturer Jamestown Cladding and Profiling Ltd

Facilities of the Manufacturer Unit 20 Newbridge Industrial Estate
Newbridge
Co Kildare

Standard **BS EN 1090-2: 2008 + A1:2011**

Execution Class up to EXC 4 according BS EN 1090-2:2008+A1:2011

Welding Process(es) 121 – Submerged Arc Welding with one wire electrode
123 – Submerged Arc Welding with multiple wire electrodes
135 – Metal Active Gas Welding

Base Material(s) Up to and including S355K2 according BS EN 10025-2

Responsible Welding Coordinator Gerry McCarthy IWE

Alternate Niall Fortune (BCSA)
Tara Keaveney (BCSA)

Attestation This certificate attests that all procedures for the execution and surveillance of welding works (in connection with **BS EN 1090-1:2009+A1:2011**) are implemented.

Date of first issue May 2013

Date of this issue 20th May 2013

Date of next Surveillance by 30th April 2014

Validity Period This certificate remains valid as long as the conditions laid down in the harmonised standard in reference or the manufacturing conditions in the factory or the FPC itself are not modified significantly

Chairman: D Woodward *[Signature]* **Scheme Manager:** J Carmichael *[Signature]*

Implications of EN 1090 for the steel industry

Clients should only engage certified steelwork contractor

Declaration of Performance

No. JE 0655 – Bryn Road

Type: Welded steel components in accordance with component specification No. 124384-YTR-ECV-SPE, Rev 0 & Drawing No 124384-YTR-ECV-DRG-115, Rev 0.

Intended use/s: Steel structures or composite steel and concrete structures where the components can be made from hot rolled, cold-formed steel. Steel material from which components are made can be in various shapes/profiles e.g. plates, sheet, strip, bars, castings or forgings.

Manufacturer: Jamestown Cladding and Profiling Ltd
Unit 20 Newbridge Ind. Est.,
Newbridge, Co. Kildare, Ireland.

System of assessment and verification of constancy of performance: System 2+

Notified Body: Steel Construction Certification Scheme
4, Whitehall Court. Westminster
London, SW1A 2ES

Notified Body No: 2773

Steel Construction Certificate Scheme has performed (i) initial inspection of the manufacturing plant and factory product control and (ii) continuous surveillance, assessment and evaluation of factory production control and issued Factory Production Control certificate 2773-CPR-0046 and Welding certificate 2773-CPR-0046-WC.

Essential characteristics	Performance ¹	Harmonised technical specification
Tolerances on dimensions and shape	EN 1090-2, tolerance class 1	EN 1090-1: 2009 + A1: 2011
Weldability	EN 10025-2, S355J2 & EN 10025-5, S355J2W	EN 1090-1: 2009 + A1: 2011
Fracture toughness/impact resistance	S355J2 & S355J2W (27J @ -20°C)	EN 1090-1: 2009 + A1: 2011
Load bearing capacity	NPD	EN 1090-1: 2009 + A1: 2011
Fatigue strength	NPD	EN 1090-1: 2009 + A1: 2011
Resistance to fire	NPD	EN 1090-1: 2009 + A1: 2011
Reaction to fire	Class A1 (steel only)	EN 1090-1: 2009 + A1: 2011
Release of cadmium and its compounds	NPD	EN 1090-1: 2009 + A1: 2011
Radioactivity	NPD	EN 1090-1: 2009 + A1: 2011
Durability	NPD	EN 1090-1: 2009 + A1: 2011

¹ These characteristics should be interpreted in accordance with Component Specification No. 124384-YTR-ECV-SPE, Rev 0 & Drawing No 124384-YTR-ECV-DRG-115, Rev 0.

The performance of the product identified above is in conformity with the declared performance identified in the table.

Signed for and on behalf of Jamestown Cladding and Profiling Ltd by:

Niall Fortune, Responsible Welding Coordinator

Place and date of issue:
Jamestown Cladding and Profiling Ltd
Unit 20 Newbridge Ind. Est.,
Newbridge, Co. Kildare, Ireland.

Date: 18th June 2013

Implications of EN 1090 for the steel industry

Project specifications for steelwork need to be updated to comply with the requirements of EN 1090

- EN 1090 requires Specifiers to make a series of project- or application-specific decisions before execution commences on each part of the works.
- Engineers need to generate project specifications to reflect the requirements of the project

Implications of EN 1090 for the steel industry

Engineers and builders should perform surveillance to check for compliance with specification

- Engineers should carry out surveillance to ensure the project is manufactured in compliance with the specification
- **(Certification to EN 1090 \neq Compliance with specification)**



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