



STEEL INDUSTRY
GUIDANCE NOTES

Inspection Documents

Assurance that steel products meet the specified properties is achieved by providing the customer with a manufacturer's Inspection Document that contains the Chemical and Mechanical properties of the steel. The different types of Inspection Document provided by the manufacturer, their traceability through the fabrication process and some of the implications of CE Marking are explained in this SIGNS.

Manufacturers of steel products are required to test all steel materials and to provide documentary evidence of the steel's properties. The testing requirements includes Chemical analysis of the steel, as well as validation of Mechanical Properties such as yield strength, tensile strength, elongation and Charpy impact toughness. All of this information is then displayed in the steel's Inspection Document.

Types of Inspection Documents

Manufacturers of structural steel products provide assurance that their products meet the specified properties (yield strength, tensile strength, elongation etc) by providing the customer with either a Type 2.2 'Test Report' or a Type 3.1/3.2 'Inspection Certificate' (formally called Test Certificates) in accordance with BS EN 10204. Although these two documents give similar information, engineers need to be aware of the differences.

In a Type 2.2 Test Report the characteristics of the steel are based on quality control tests on the manufacturer's processes carried out as part of the initial product development. The Type 2.2 Test Report is therefore a declaration by the manufacturer that its product results are 'typical' of product characteristics for that particular product type, but are not specifically tests on the material being supplied. (This is formally referred to as "non specific testing").

The information given on a Type 3.1/3.2 Inspection Certificate are actual test results from the material in the lot from which the steel products have been supplied (formally referred to as "specific testing"). A 3.1 Inspection Certificate is endorsed only by the manufacturers own representative who has to be independent from the manufacturing process (Test House Manager) whilst a 3.2 Inspection Certificate has additionally been countersigned by an independent inspection authority who has confirmed that the testing and inspection process demanded by the specification have been adhered to correctly.

Both the National Structural Steelwork Specification (5th edition) (NSSS) and BS 5950-2 require that "specific

testing" be carried out on the steel and that Type 3.1 (or 3.2) Inspection Certificate documents shall be supplied.

Responsibility of the Steelwork Contractor

The responsibility for ensuring that the steel used conforms to the specification lies with the steelwork contractor. This is achieved by ensuring that all the steel used on a particular contract can be related to a manufacturer's Type 3.1 (or 3.2) Inspection Certificate. This includes steel that is obtained via a stockholder as well as steel obtained directly from a manufacturer.

Most Inspection Documents are provided electronically and the requirement in the NSSS is for the steelwork contractor to have access to these Inspection Documents without needing to obtain physical copies. However, the introduction of CE Marking for fabricated steelwork will change this requirement and steelwork contractors will need to obtain and retain copies of the relevant Inspection Documents in their project files as proof that suitable steel materials have been used, if queried by the regulatory authorities.

Traceability

The NSSS requires that all steel used on a contract is traceable to a Type 3.1 (or 3.2) Inspection Certificate. However, there is no requirement for each fabricated element within a structure to be traceable to a particular Inspection Certificate. This process involves checking that the Inspection Documents provided are in accordance with the purchase specification. After that, steel materials with common specification may be held in a common 'batch'.

CE Marking

CE Marking of fabricated steelwork is covered by the harmonized standard BS EN 1090-1 which is supported by the execution (fabrication and erection) standard BS EN 1090-2. BS EN 1090-1 has recently been published by BSI and CE Marking of fabricated steel is likely to start in May 2010 and become mandatory in most European Countries

in May 2011. With regard to Inspection Documents BS EN 1090-2 requires Type 3.1 (or 3.2) Inspection Certificate for all steel products except those steels with the following qualities S275JR, S275J0, S355JR and S355J0. For these steels a Type 2.2 Test Report is allowed. However, it is likely that the new CE Marking edition of the National Structural Steelwork Specification will specify Type 3.1 (or 3.2) Inspection Certificate for all steel products.

The European Commission is proposing to amend the Construction Products Directive (CPD) and introduce the Construction Products Regulations (CPR). The main difference between the CPD and the CPR is that the latter is regulatory under EU Law and is therefore mandatory in all member states. If accepted the CPR is likely to come in to force in 2012. The effect will be to make CE Marking of construction products mandatory in all member states including the UK and Ireland.

A Typical Inspection Document

A typical CE Marked, Type 3.1 Inspection Document for a steel plate is shown in Figure 1. This Inspection Certificate is issued by Corus UK and contains the name of the manufacturer and the name of the place where the steel was manufactured, the Corus logo and the BS EN ISO 9001 certification body (in this case Lloyd's Register Quality Assurance). The document also contains the CE mark and underneath a four digit number which is the number of the Notified Body that assessed the suitability of Corus' Factory Production Control systems for CE Marking (in this case Lloyd's Verification Services). The Chemical and Mechanical properties of the plate and a brief physical description of the plate are also given.

INSPECTION CERTIFICATE A2

Corus UK Limited
Corus Construction & Industrial
P.O. Box 1, Scunthorpe,
North Lincolnshire, DN16 1BP.
Telephone: 01724 464440
Fac: 402363. Telex: 522614

Customer: EXCELLENT STEEL LTD
STEEL INDUSTRIAL ESTATE
IRONVILLE
NORFOLKSHIRE
LN4 1XX

INSPECTION WORKS INSPECTION

CE 0038

Item Mark:- 214/OR/133/006/PR20/BS01
1 72407 EX629/ 1 401 544 28
1 72407 EX629/ 2 401 544 28
1 72407 EX629/ 3 401 544 28

Plate(s) and tests normalised for sufficient time to achieve a uniform temp. of 890 C to 930 C, then air cooled.
CE Marking Certificate Number = 0038/CR/2006002A
Ultrasonically tested in accordance with BS 5996 Grade LC3E Technique 2 and found to be satisfactory.
Surface Inspected.

Figure 1.
A typical CE Marked,
Type 3.1 Inspection
Document

Key Points

1. Assurance that steel products meet the specified properties is achieved by providing the customer with a manufacturer's Inspection Document that contains the Chemical and Mechanical properties of the steel.
2. Type 2.2 Test Report or a Type 3.1 (or 3.2) Inspection Certificate (formally called Test Certificates) in accordance with BS EN 10204 may be used.
3. The properties given on a Type 2.2 Test Report may not be from tests carried out on the steel products actually supplied.
4. The NSSS and BS 5950-2 require the specific tests to be carried out on the steel and for Type 3.1 (or 3.2) Inspection Certificate to be supplied.
5. The responsibility for ensuring that the steel used conforms to the specification lies with the steelwork contractor.
6. The NSSS requires that all steel used on a contract is traceable to a Type 3.1 (or 3.2) Inspection Certificate.
7. There is no requirement for each fabricated element within a structure to be traceable to a particular Inspection Document

Further sources of Information

1. National Structural Steelwork Specification for Building Construction 5th Edition, Published by BCSA & SCI, publication No. 203/07, 2007.
2. National Structural Steelwork Specification for Building Construction 5th Edition (CE Marking version). In preparation.
3. Commentary on the National Structural Steelwork Specification for Building Construction 4th Edition, Published by BCSA & SCI, publication No. 209/03, 2003.
4. Guide to the CE Marking of Structural Steelwork, BCSA publication No. 46/08, 2008.
5. BS EN 10204, 'Metallic Products – Types of Inspection Documents', BSI.
6. BS EN 1090-1: 2009, 'Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components', BSI, 2009.
7. BS EN 1090-2: 2008, 'Execution of steel structures and aluminium structures – Part 2: Technical requirements for steel structures', BSI, 2008.