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A service provided by the
British Stainless Steel Association

European Standardisation

Introduction

Since 1988 a new series of 'mandatory' European standards (EN = Europäischen Normen) has been created, to replace national standards, such as BS, DIN, SS and NF, throughout 18 countries of Western Europe.
EN are a part of the 'Single Market' legislation, designed to give equal opportunities for firms to compete throughout Europe, by harmonising the technical requirements between countries. The 'mandatory' part is that the national standards bodies, of which BSi is one, are required to officially withdraw their national standards, when an EN is created with the same scope of application.

Consistent Pattern of Standards

The aim of European Standardisation is to produce a logical, common pattern, in which items are standardised in one document only, reference being made to this document from other standards. For example, tensile testing methods are standardised in a different document to material property values, and dimensional tolerances in other separate standards. Thus, changed requirements need only to be written into one document. This differs from the existing British pattern, so the replacement process is not as simple as a one-for-one substitution. Table1 gives examples of EN standards relevant to stainless steels, with their dates of publication.

Implementation of EN

The fact that BSi and other national bodies publish EN does not compel people to use them. (Note the continued use of the BS 'Emergency Number' {also En} series of steels years after they have been officially replaced.) Only when the suppliers and customers understand European Standards, believe that they have a good technical content, positively advantageous to themselves, and when there are incentives to change, will it actually happen.

EN 10088 part 1

The three parts of EN 10088 were originally published in October 1995. Part 1 lists 83 stainless steels, giving chemical composition, various physical properties, including density and a general description of the various classes of stainless steels. It is not intended for the direct placing of orders. The intention is that the steels required in the various steel product standards and application standards shall be selected from this list, as far as possible. They should not be defined slightly differently unintentionally, nor without a technical reason for different chemistry. As part of the first 5-year revision, the list in part 1 is likely to be expanded to include corrosion resistant, hot oxidation resistant and creep resistant stainless steels, for general and pressure vessel use, with a cross-reference matrix showing which steels are in which standards including the main application standards.

EN 10088 Part 2

This part of EN 10088 gives the properties and other delivery conditions for flat products for general purposes, i.e. not for pressure vessels, nor for aerospace or other specialised applications, such as springs. It is used for ordering purposes. It contains 68 steels, more than BS 1449:2, which it largely replaces. Amongst its features are: -

1. A suggested concise layout for order details, so that items are not omitted.
2. References to other EN's for dimensional tolerance details – see Table 1.
3. A steel naming and numbering system, developed from the German Werkstoff system, which was the most suitable system available at the time the first EN standards were created.
4. Steel grades classed as 'standard' or 'special', depending on how widely available they are, and how wide is their scope of application. 'Special' grades are likely to be more difficult to obtain, although the technical requirements are not different in kind between the two classes. There should be at least one grade listed, suitable for each general application.
5. Mechanical properties are significantly more demanding than those replaced in BS 1449:2, but quite attainable in practice, with generally higher strength values, demonstrating the very useful properties of stainless steels. Minimum properties are slightly different for quarto plate, continuously hot rolled and cold rolled material respectively, again to highlight the good properties of stainless steels.
6. Proof strength values at elevated temperatures are included and properties in the work hardened condition.
7. Process route and surface finish designation is developed from the BS 1449:2 system, but standardises and distinguishes more of the finishes that are currently available.
8. Testing frequencies are reduced to recognise the increases in cast weights, piece weights and extensive improvements to manufacturers quality management systems since previous standards were written.
9. Marking requirements and options are clearly tabled.

EN 10088 Part 3

This is the corresponding standard for long products, but unlike BS970: 1, which it replaces in part, it does not cover forgings, which have been standardised in BS EN 10250-4:2000. EN 10088-3 contains 61 steels, a slightly different selection to those in part 2. It uses the same process route and surface finish code system as part 2. This is a new departure for long products standards, and it remains to be seen if it is successful. Mechanical properties are quoted up to 250mm ruling section, with a defined allowance for final cold deformation.

Hot Oxidation Resistant, Pressure Purposes and Creep Resistant Steels

BSEN 10095 was published in 1999 covering Heat Resisting Steels and Nickel Alloys in both flat & long product forms
This covers 6 ferritic, 14 austenitic & 1 duplex heat resisting stainless steel grades for applications involving the resistance to hot gases & combustion products at temperatures above 550°C, but not for pressure vessel applications.

The corresponding EN for pressure purposes are EN 10028-7 (2000) for flat products and EN 10272 (2000) for rolled bars. They contain a selection of steels from EN 10088-1, plus

a few additional creep resistant grades. There will also be a specification specifically for creep resistant steels, not for pressure purposes, which will be prEN 10302

The Overall Standards System

All these standards will refer to the same set of dimensional tolerance, testing, certification, designation and quality assurance standards, making trade throughout Europe easier and simpler, at least for the next generation. Meanwhile, efforts are continuing to reach global harmonisation of standards.

Conclusion

European standardisation brings together the ideas, strengths and capabilities of suppliers, distributors and users throughout Europe. It should allow simplification of material flows, shorter lead times, lower stock levels, simpler certification and a clearer understanding of order requirements, allowing more economic use of stainless steels throughout Europe.

Further information on standards containing stainless steel grades can be found on the BSSA web site (www.bssa.org.uk) in the technical information – online technical advice section.

Table1 Summary of European Standards for Stainless Steels

Type	Number	Title	Date
General Purpose Products	EN 10088-1	Stainless Steels – Part 1: List of stainless steels (not for ordering)	1995
	EN 10088-2	Stainless Steels – Part 2: Technical delivery conditions for sheet/plate and strip for general purposes	1995
	EN 10088-3	Stainless Steels – Part 3: Technical delivery conditions for semi-finished products, bars, rods, and sections for general purposes (Can be used for ingots, slabs, blooms and billets)	1995
	EN 10095	Heat resisting steels and alloys (Stainless steels and nickel alloys)	1999
	prEN 10302	Creep resisting steels and nickel alloys	
Pressure Purpose Products	EN 10028-7	Flat products made of steel for pressure purposes – Part 7: Stainless steels (includes Plates, Hot rolled sheet/plate and strip. Cold rolled sheet/plate and strip, and creep-resistant steels	2000
	EN 10272	Rolled bars made of stainless steels for pressure purposes	2000
Dimensional	EN 10029	Hot rolled steel plates 3mm thick or above – Tolerance on dimensions, shape and mass	1991
	EN 10048	Hot rolled narrow steel strip – Tolerances on dimensions and shape	1997
	EN 10051	Continuously hot rolled uncoated plate, sheet and strip of non-alloy and alloy steels – tolerances on dimensions and shape	1992
	EN 10258	Cold –rolled stainless steel narrow strip and cut lengths – tolerances on dimensions and shape	1997
	EN 10259	Cold-rolled stainless steel wide strip and plate/sheet – Tolerances on dimensions and shape	1997
Testing and Certification	EN 10204	Metallic products – Types of inspection documents	1991
Designation	EN 10020	Definition and classification of steel grades	1999
Quality Assurance	BS EN ISO9002:1994	Quality Systems. Model for quality assurance in production, installation and servicing	2000

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