
ICE Pocket Guide to Steels in the Built Environment

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Chapter 2

British, European and international standards

Standards constantly evolve and are updated and superseded as advancements are made in knowledge and research. To ensure that the most up-to-date information is used, it is recommended that designers and specifiers check the status of standards on a regular basis. The BSI website is a useful tool for doing this, giving details on status and providing links to any preceding and superseding standards. Updates on new and revised steel standards are also published in *New Steel Construction* magazine from the BCSA and Steel for Life.

The steels provided in this guide are not exhaustive and those listed are given based on availability and informative value. Despite best efforts to ensure correctness, errors may be found. Readers are reminded to consult all relevant BS, EN and ISO standards and encouraged to obtain copies of these and associated codes of practice where relevant. All references to BS, EN or ISO standards are current at the time of writing.

Proprietary steels, and those covered by European Technical Assessments (ETA) or similar, are not included within the scope of this guide.

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Chapter 3

How to use this guide

For much of the content, each steel is given its own page, headed by its steel name, according to BS EN 10027-1:2016, and steel number, according to BS EN 10027-2:2015.

Steel Grade

S355J2

Steel Number

1.0577

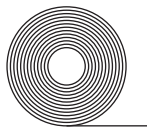
The taxonomy of the steel name is then described based upon its material standard, BS EN 10020, and BS EN 10027-2. This is followed by icons representing example products which might be procured using the steel described. These icons are an indication only and the availability of specific products should be confirmed with the supply chain. A key for these symbols is given below.

Open Sections
(UB/UC/I/H)Open Sections
(Channels/Angles)

Bar(s)



Plate/Sheet

Square Hollow
SectionsCircular Hollow
SectionsRectangular
Hollow SectionsElliptical Hollow
Sections¹

Strip/Coil

Note 1: greyed-out elliptical hollow section indicates limited availability.

Steel Grade
S420N

Steel Number
1.8902

- S Structural steel
 420 420 N/mm² minimum yield strength
 N Normalised or Normalised-rolled...
 _ Minimum 40 J impact energy at -20°C



S420N is a normalised/normalised-rolled, weldable, fine-grained, structural steel (BS EN 10025-3), an alloy special steel (BS EN 10020), and a high strength weldable alloy special steel not intended for heat treatment by the user (1.89XX, BS EN 10027-2). S420N steel must be fully killed.

Min yield strength, R_{eH} (N/mm ²)	Tensile strength, R_m (N/mm ²)	Min elongation after fracture (%)	CEV (max %)
420	520 to 680	19	0.48

Example Designation

BS EN 10025-3 – S420N

Relevant Standards

Material	Design	Execution
BS EN 10025-3	BS EN 1993 BS EN 1994	BS EN 1090-2 NSSS (BCSA)

Steel Grade

S235J2W

Steel Number

1.8961

S Structural steel

235 235 N/mm² minimum yield strength

J2 Minimum 27 J impact energy at –20°C

W Weather resistant



S235J2W is a structural steel with improved atmospheric corrosion resistance (BS EN 10025-5), an alloy special steel (BS EN 10020), and a [high strength] weldable alloy special steel not intended for heat treatment by the user (1.89XX, BS EN 10027-2). S235J2W steel must be fully killed.

Min yield strength, R_{eH} (N/mm ²)	Tensile strength, R_m (N/mm ²)	Min elongation after fracture (%)	CEV (max %)
235	360 to 510	26	0.44

Example Designation

BS EN 10025-5 – S235J2W

Relevant Standards

Material	Design	Execution
BS EN 10025-5	BS EN 1993	BS EN 1090-2 NSSS (BCSA)

S890QH	1.8637
S890QLH	1.8638
S890QL1H	1.8690

- S Structural steel
 890 890 N/mm² minimum yield strength
 Q Quenched and tempered...
 – Minimum 30 J impact energy at –20°C
 L Minimum 30 J impact energy –40°C
 L1 Minimum 35 J impact energy –50°C
 H Hollow section

Standard	Min yield strength, R_{eH} (N/mm ²)	Tensile strength, R_m (N/mm ²)	Min elongation (%)	CEV (max %)
BS EN 10210-3	890	940 to 1120	11	0.72
BS EN 10219-3	890	940 to 1120	9	0.72

S900MH	1.8619
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- S Structural steel
 900 900 N/mm² minimum yield strength
 M Thermomechanical-rolled...
 – Minimum 40 J impact energy at –20°C
 H Hollow section

Standard	Min yield strength, R_{eH} (N/mm ²)	Tensile strength, R_m (N/mm ²)	Min elongation (%)	CEV (max %)
BS EN 10219-3	900	930 to 1200	5	0.60