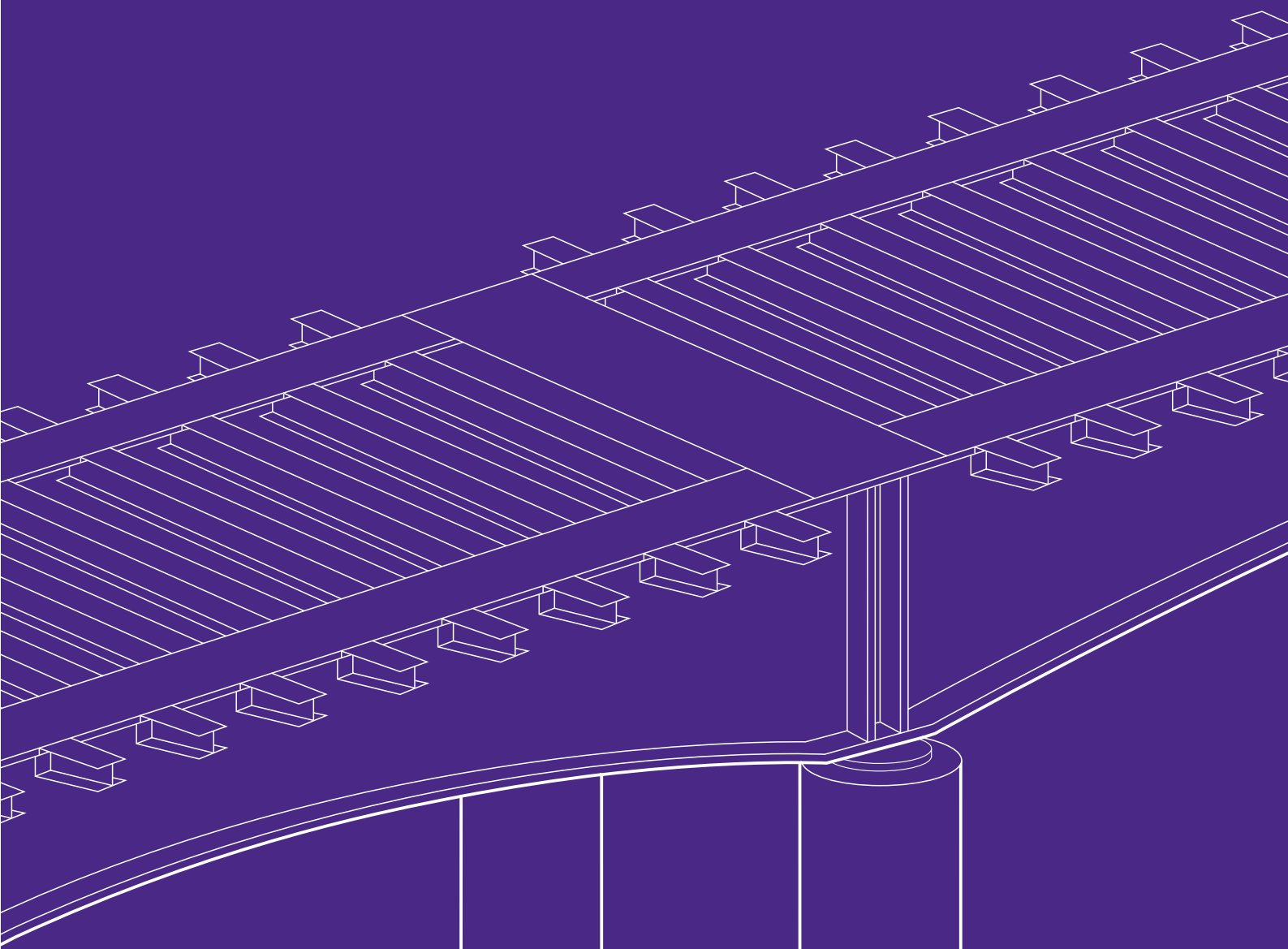
Corus Construction & Industrial

European structural steel standard EN 10025 : 2004

Explanation and comparison to previous standards



EN 10025 : 2004 is the new European standard for structural steel.

EN 10025 : 2004 is the new European standard for structural steel. This leaflet shows the new grades, properties and the nearest equivalent grades from former standards including EN 10025 : 1993. The grade designation system is also explained.

Corus produces a very wide range of rolled sections and plates and the information below has been prepared to show how the new standard applies to these products. For information on the size ranges available please ring +44 (0) 1724 404400 and ask for 'Plate products range of sizes' for plate and plate cut from coil, or 'Structural sections to BS4 part 1' for rolled sections.

History of the standard

The European Committee for Iron and Steel Standardisation is responsible for producing the European Standards (ENs) for structural steels. The first of these standards, EN 10025, was published in the UK by BSI as EN 10025 : 1990, partly superseding BS 4360 : 1986, which was re-issued as BS 4360 : 1990. In 1993, a second edition of EN 10025 was made available together with EN 10113 : parts 1, 2 & 3 and EN 10155. In June 1994, EN 10210 : part 1 was published and at the same time BS 4360 was officially withdrawn. The balance of the BS 4360 steels not affected by these ENs were re-issued in new British Standards BS 7613 and BS 7668. In 1996, with the publication of EN 10137, BS 7613 was withdrawn. BS 7668 will remain until an EN for atmospheric corrosion resistant hollow sections is available.

In 2004 the standard EN 10025 was revised to address the provisions of EU Construction Products Directive (89/106/EEC). It is now published in six parts to bring together almost all the 'Structural Metallic Products' into one comprehensive standard.

The new standard EN 10025 : 2004

The new standard is published in six parts and draws together earlier standards to produce one standard for the majority of structural steel products. The parts are:

- Part 1 - General technical delivery conditions.
- Part 2 - Technical delivery conditions for non-alloy structural steels.
  Supersedes EN 10025 : 1993
- Part 3 - Technical delivery conditions for normalised/ normalised rolled weldable fine grain structural steels.
  Supersedes EN 10113 : parts 1 & 2 : 1993
- Part 4 - Technical delivery conditions for thermomechanically rolled weldable fine grain structural steels.
  Supersedes EN 10113 : parts 1 & 3 : 1993
- Part 5 - Technical delivery conditions for structural steels with improved atmospheric corrosion resistance - also known as weathering steels.
  Supersedes EN 10155 : 1993
- Part 6 - Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition.
  Supersedes EN 10137 : parts 1 & 2 : 1996

Design and technical advice is available from our Technical Sales & Marketing department.

Grade designation systems

The designation systems used in the new standard are similar but not identical to EN 10025 : 1993 and very different to the familiar BS 4360 designations so the guide below has been prepared to assist purchasers, specifiers, designers and users of steel.

Symbols used in EN 10025 : part 2 : 2004 Non-alloy structural steels

S...	Structural steel
E...	Engineering steel
.235...	Minimum yield strength (Reh) in MPa @ 16mm
...JR..	Longitudinal Charpy V-notch impacts 27 J @ +20°C
...J0..	Longitudinal Charpy V-notch impacts 27 J @ 0°C
...J2..	Longitudinal Charpy V-notch impacts 27 J @ -20°C
...K2..	Longitudinal Charpy V-notch impacts 40 J @ -20°C
...+AR	Supply condition as rolled
...+N	Supply condition normalised or normalised rolled
Customer options	
...C..	Grade suitable for cold forming
...Z..	Grade with improved properties perpendicular to the surface

Examples: S235JR+AR, S355K2C+N

Symbols used in EN 10025 : part 3 : 2004 Normalised/normalised rolled weldable fine grain structural steels

S...	Structural steel
.275...	Minimum yield strength (Reh) in MPa @ 16mm
...N..	Longitudinal Charpy V-notch impacts at a temperature not lower than -20°C
...NL..	Longitudinal Charpy V-notch impacts at a temperature not lower than -50°C
Customer options	
...Z..	Grade with improved properties perpendicular to the surface

Examples: S275N, S420NL Z35

Symbols used in EN 10025 : part 4 : 2004 Thermomechanically rolled weldable fine grain structural steels

S...	Structural steel
.275...	Minimum yield strength (Reh) in MPa @ 16mm
...M..	Longitudinal Charpy V-notch impacts at a temperature not lower than -20°C
...ML..	Longitudinal Charpy V-notch impacts at a temperature not lower than -50°C
Customer options	
...Z..	Grade with improved properties perpendicular to the surface

Examples: S355M, S460ML Z25

Grade designation systems (continued)

Symbols used in EN 10025 : part 5 : 2004
Structural steels with improved atmospheric corrosion resistance – also known as weathering steels

S...	Structural steel
.355...	Minimum yield strength (Reh) in MPa @ 16mm
...J0..	Longitudinal Charpy V-notch impacts 27 J @ 0°C
...J2..	Longitudinal Charpy V-notch impacts 27 J @ -20°C
...K2..	Longitudinal Charpy V-notch impacts 40 J @ -20°C
...W..	Improved atmospheric corrosion resistance
...P..	Greater phosphorus content (grade S355 only)
...+AR	Supply condition as rolled
...+N	Supply condition normalised or normalised rolled
Customer options	
...Z..	Grade with improved properties perpendicular to the surface

Examples: S235J0W+AR, S355K2W+N Z25

Symbols used in EN 10025 : part 6 : 2004
Flat products of high yield strength structural steels in the quenched and tempered condition

S...	Structural steel
.460...	Minimum yield strength (Reh) in MPa @ 16mm
...Q..	Longitudinal Charpy V-notch impacts at a temperature not lower than -20°C
...QL..	Longitudinal Charpy V-notch impacts at a temperature not lower than -40°C
...QL1..	Longitudinal Charpy V-notch impacts at a temperature not lower than -60°C
Customer options	
...Z..	Grade with improved properties perpendicular to the surface

Examples: S460Q, S690QL

Grades, properties and nearest equivalents

The tables below show the grades, properties and nearest equivalent grades from earlier standards. The grade designations are explained on the previous pages.

Table 1

EN 10025 : part 2 : 2004 Non-alloy structural steels

Comparison between grades in EN 10025 : part 2 : 2004 and nearest equivalent versions in EN 10025 : 1993 and BS 4360 : 1990						
EN 10025 : part 2 : 2004					EN 10025 : 1993	BS 4360 : 1990
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade	Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm		
S185	185	290/510	-	-	S185	-
- [1]	235	360/510	-	-	S235	40A
S235JR [2]			20	27	S235JRG1/G2	40B
S235J0			0	27	S235J0	40C
S235J2			-20	27	S235J2G3/G4	40D
- [1]	275	410/560	-	-	S275	43A
S275JR [2]			20	27	S275JR	43B
S275J0			0	27	S275J0	43C
S275J2			-20	27	S275J2G3/G4	43D
- [1]	355	470/630	-	-	S355	50A
S355JR [2]			20	27	S355JR	50B
S355J0			0	27	S355J0	50C
S355J2			-20	27	S355J2G3/G4	50D
S355K2			-20	40	S355K2G3/G4	50DD
E295	295	470/610	-	-	E295	-
S335	335	570/710	-	-	S335	-
E360	360	650/830	-	-	E360	-

1 MPa = 1 N/mm^2

Notes

1 For all products to be compliant with the EU Construction Products Directive (CPD 89/106/EC) the material must offer a guaranteed minimum impact performance. This has resulted in the removal of this grade from the standard, and the lowest grade now offered is the JR version for each yield strength variation.

2 Verification of the specified impact value is only carried out when agreed at the time of the enquiry and order.

Grades, properties and nearest equivalents (continued)

Table 2

EN 10025 : part 3 : 2004 Normalised/normalised rolled weldable fine grain structural steels

Comparison between grades in EN 10025 : part 3 : 2004 and nearest equivalent versions in EN 10113 : part 2 : 1993 and BS 4360 : 1990						
EN 10025 : part 3 : 2004					EN 10113 : part 2 : 1993	BS 4360 : 1990
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade	Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm		
S275N	275	370/510	-20	40	S275N	43DD
S275NL			-50	27	S275NL	43EE
S355N	355	470/630	-20	40	S355N	50
S355NL			-50	27	S355NL	50EE
S420N	420	520/680	-20	40	S420N	-
S420NL			-50	27	S420NL	-
S460N	460	550/720	-20	40	S460N	55C
S460NL			-50	27	S460NL	55EE

1 MPa = 1 N/mm^2

Table 3

EN 10025 : part 4 : 2004 Thermomechanically rolled weldable fine grain structural steels

Comparison between grades in EN 10025 : part 4 : 2004 and nearest equivalent versions in EN 10113 : part 3 : 1993					
EN 10025 : part 4 : 2004					EN 10113 : part 3 : 1993
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm	
S275M	275	370/510	-20	40	S275M
S275ML			-50	27	S275ML
S355M	355	470/630	-20	40	S355M
S355ML			-50	27	S355ML
S420M	420	520/680	-20	40	S420M
S420ML			-50	27	S420ML
S460M	460	550/720	-20	40	S460M
S460ML			-50	27	S460ML

1 MPa = 1 N/mm^2

Table 4

EN 10025 : part 5 : 2004 Structural steels with improved atmospheric corrosion resistance - also known as weathering steels

Comparison between grades in EN 10025 : part 5 : 2004 and nearest equivalent versions in EN 10155 : 1993 and BS 4360 : 1990						
EN 10025 : part 5 : 2004					EN 10155 : 1993	BS 4360 : 1990
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade	Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm		
S235J0W	235	360/510	0	27	S235J0W	-
S235J2W			-20	27	S235J2W	-
S355J0WP	355	470/630	0	27	S355J0WP	WR50A
S355J2WP			-20	27	S355J2WP	-
S355J0W	355	470/630	0	27	S355J0W	WR50B
S355J2W			-20	27	S355J2W	WR50C
S355K2W			-20	40	S355K2W	WR50D

1 MPa = 1 N/mm²

Table 5

EN 10025 : part 6 : 2004 Flat products of high yield strength structural steels in the quenched and tempered condition

Comparison between grades in EN 10025 : part 6 : 2004 and nearest equivalent versions in EN 10137 : part 2 : 1996 and BS 4360 : 1990						
EN 10025 : part 6 : 2004					EN 10137 : part 2 : 1996	BS 4360 : 1990
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade	Grade
	Strength at t = 16mm (MPa)		Temp (°C) [1]	Energy (J) t = 16mm		
S460Q	460	550/720	0	40	S460Q	-
S460QL			0	50	S460QL	-
S460QL1			0	60	S460QL1	55F
S500Q	500	590/770	0	40	S500Q	-
S500QL			0	50	S500QL	-
S500QL1			0	60	S500QL1	-
S550Q	550	640/820	0	40	S550Q	-
S550QL			0	50	S550QL	-
S550QL1			0	60	S550QL1	-
S620Q	620	700/890	0	40	S620Q	-
S620QL			0	50	S620QL	-
S620QL1			0	60	S620QL1	-
S690Q	690	770/940	0	40	S690Q	-
S690QL			0	50	S690QL	-
S690QL1			0	60	S690QL1	-
S890Q	890	940/1100	0	40	S890Q	-
S890QL			0	50	S890QL	-
S890QL1			0	60	S890QL1	-
S960Q	960	980/1150	0	40	S960Q	-
S960QL			0	50	S960QL	-

1 MPa = 1 N/mm²

Note
1 Other impact temperatures can be specified.

www.corusgroup.com

Designed and produced by
Orchard Corporate Ltd.

Literature hotline:

T +44 (0) 1724 404400
F +44 (0) 1724 404433

Sales office and headquarters:

Corus Construction & Industrial
PO Box 1
Brigg Road
Scunthorpe
DN16 1BP
United Kingdom
T +44 (0) 1724 404040
F +44 (0) 1724 405600

For Construction related enquiries:

Corus Construction & Industrial
Technical Sales & Marketing
PO Box 1
Brigg Road
Scunthorpe
DN16 1BP
United Kingdom
T +44 (0) 1724 405060
F +44 (0) 1724 404224

For plates technical enquiries and customer support:

Corus Construction & Industrial
Plates Technical Advisory Services
PO Box 1
Brigg Road
Scunthorpe
DN16 1BP
United Kingdom
T +44 (0) 1724 402106
F +44 (0) 1724 381949

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