



# DanSteel A/S



## **European structural steel standard EN 10025:2004**

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## **EN 10025:2004** **The new European standard for structural steel**

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:

- |                        |   |
|------------------------|---|
| <b>EN 10025-1:2004</b> | General technical delivery conditions.  |
| <b>EN 10025-2:2004</b> | Technical delivery conditions for non-alloy structural steels.<br>(Supersedes EN 10025:1993)  |
| <b>EN 10025-3:2004</b> | Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels.<br>(Supersedes EN 10113-1,-2:1993)                            |
| <b>EN 10025-4:2004</b> | Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels.<br>(Supersedes EN 10113-1,-2:1993)                                 |
| <b>EN 10025-5:2004</b> | Technical delivery conditions for structural steels with improved atmospheric corrosion resistance.<br>(Supersedes EN 10155:1993)                                   |
| <b>EN 10025-6:2004</b> | Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition.<br>(Supersedes EN 10137-1,-2:1996) |



## Grade designation systems

The designation systems used in the new standard are similar but not identical to EN 10025:1993.

### Symbols used in EN 10025-2:2004 non-alloy structural steels.

Examples S235JR+AR, S355J2C+N

- S... Structural steel.
- E.... Engineering steel.
- .235 Minimum yield strength (ReH) in MPa at 16mm
- ....JR Longitudinal Charpy V-notch impacts 27 J at + 20°C
- ....J0 Longitudinal Charpy V-notch impacts 27 J at 0°C
- ....J2 Longitudinal Charpy V-notch impacts 27 J at - 20°C
- ....K2 Longitudinal Charpy V-notch impacts 40 J at - 20°C
- .....+AR Supply in as rolled conditions
- .....+N Supply in normalized/normalized rolled conditions

#### Customer options.

- .....C Grade suitable for cold forming
- .....Z Grade with improved properties perpendicular to the surface.

**Symbols used in EN 10025-3:2004 normalized/normalized rolled weldable fine grain structural steels.**

Examples S275N, S275NL

- S... Structural steel.
- .275 Minimum yield strength (ReH) in MPa at 16mm
- ....N Longitudinal Charpy V-notch impacts temp. not lower than -20°C
- ....NL Longitudinal Charpy V-notch impacts temp. not lower than -50°C

#### Customer options.

- .....Z Grade with improved properties perpendicular to the surface.



## Grade designation systems (continued)

**Symbols used in EN 10025-4:2004** thermomechanical rolled weldable fine grain structural steels.

Examples S355M, S355ML

- S... Structural steel.
- .275 Minimum yield strength (ReH) in MPa reference to 16mm
- ....M Longitudinal Charpy V-notch impacts temp. not lower than -20°C
- ....ML Longitudinal Charpy V-notch impacts temp. not lower than -50°C

### Customer options.

- .....Z Grade with improved properties perpendicular to the surface.

**Symbols used in EN 10025-5:2004** structural steels with improved atmospheric corrosion resistance.

Examples S235J0W+AR, S355J2W+N

- S... Structural steel.
- .355 Minimum yield strength (ReH) in MPa at to 16mm
- ....J0 Longitudinal Charpy V-notch impacts 27 J at 0°C
- ....J2 Longitudinal Charpy V-notch impacts 27 J at - 20°C
- ....K2 Longitudinal Charpy V-notch impacts 40 J at - 20°C
- ....W Improved atmospheric corrosion resistance
- ....P Greater phosphorus content (grade 355 only)
- .....+AR Supply in as rolled conditions
- .....+N Supply in normalized/normalized rolled condition

### Customer options.

- .....Z Grade with improved properties perpendicular to the surface.



## Grade designation systems (continued)

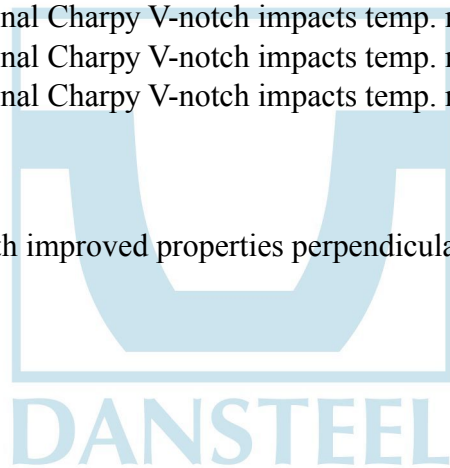
**Symbols used in EN 10025-6:2004** flat products of high yield strength structural steels in quenched and tempered condition.

Examples S460Q, S690QL

- S... Structural steel.
- .460 Minimum yield strength (ReH) in MPa at 16mm
- ....Q Longitudinal Charpy V-notch impacts temp. not lower than -20°C
- ....QL Longitudinal Charpy V-notch impacts temp. not lower than -40°C
- ....QL1 Longitudinal Charpy V-notch impacts temp. not lower than -60°C

### Customer options.

- .....Z Grade with improved properties perpendicular to the surface.





## 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 10025-2:2004 non-alloy structural steels.

Comparison between grades in EN 10025-2:2004 and EN 10025:1993					
EN 10025-2:2004				EN 10025:1993	
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm	
S185	185	290 / 510	-	-	S185
- <sup>1</sup>	235	360 / 510	-	-	S235
S235JR <sup>2</sup>			20	27	S235JRG2
S235J0			0	27	S235J0
S235J2			-20	27	S235J2G3 / G4
- <sup>1</sup>	275	410 / 560	-	-	S275
S275JR <sup>2</sup>			20	27	S275RG2
S275J0			0	27	S275J0
S275J2			-20	27	S275J2G3 / G4
- <sup>1</sup>	355	470 / 630	-	-	S355
S355JR <sup>2</sup>			20	27	S355JR
S355J0			0	27	S355J0
S355J2			-20	27	S355J2G3 / G4
S355K2			-20	40	S355K2G3 / G4
E295	295	470 / 610	-	-	E295
E335	335	570 / 710	-	-	E335
E360	360	670 / 830	-	-	E360

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 resulted in the removal of this grade from the standard, and the lowest 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 10025-3:2004 normalized/normalized rolled weldable fine grain structural steels.**

Comparison between grades in EN 10025-3:2004 and EN 10113-2:1993					
EN 10025-3:2004					EN 10113-2:1993
Grade	Yield (ReH) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm	
S275N	275	370 / 510	-20	40	S275N
S275NL			-50	27	S275NL
S355N	355	470 / 630	-20	40	S355N
S355NL			-50	27	S355NL
S420N	420	520 / 680	-20	40	S420N
S420NL			-50	27	S420NL
S460N	460	540 / 720	-20	40	S460N
S460NL			-50	27	S460NL



## Grades, properties and nearest equivalents (continued)

**Table 3.**

**EN 10025-4:2004 thermomechanical rolled weldable fine grain structural steels.**

Comparison between grades in EN 10025-4:2004 and EN 10113-3:1993					
EN 10025-4:2004					EN 10113-3:1993
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 / 530	-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	540 / 720	-20	40	S460M
S460ML			-50	27	S460ML





## Grades, properties and nearest equivalents (continued)

**Table 4.**

**EN 10025-5:2004 structural steels with improved atmospheric corrosion resistance.**

Comparison between grades in EN 10025-5:2004 and EN 10155:1993					
EN 10025-5:2004					EN 10155:1993
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		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
S355J2WP			-20	27	S355J2WP
S355J0W	355	470 / 630	0	27	S355J0W
S355J2W			-20	27	S355J2W
S355K2W			-20	40	S355K2W

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## Grades, properties and nearest equivalents (continued)

**Table 5.**

**EN 10025-6:2004 flat products of high yield strength structural steels in quenched and tempered condition.**

Comparison between grades in EN 10025-6:2004 and EN 10137-2:1996					
EN 10025-6:2004					EN 10137-2:1996
Grade	Yield (Reh) min	Tensile (Rm)	Charpy V-notch longitudinal		Grade
	Strength at t = 16mm (MPa)		Temp (°C)	Energy (J) t = 16mm	
S460Q	460	550 / 720	-20	30	S460Q
S460QL			-40	30	S460QL
S460QL1			-60	30	S460QL1
S500Q	500	590 / 770	-20	30	S500Q
S500QL			-40	30	S500QL
S500QL1			-60	30	S500QL1
S550Q	550	640 / 820	-20	30	S550Q
S550QL			-40	30	S550QL
S550QL1			-60	30	S550QL1
S620Q	620	700 / 890	-20	30	S620Q
S620QL			-40	30	S620QL
S620QL1			-60	30	S620QL1
S690Q	690	770 / 940	-20	30	S690Q
S690QL			-40	30	S690QL
S690QL1			-60	30	S690QL1
S890Q	890	940 / 1100	-20	30	S890Q
S890QL			-40	30	S890QL
S890QL1			-60	30	S890QL1
S960Q	960	980 / 1150	-20	30	S960Q
S960QL			-40	30	S960QL