

# Plates of S690Q steel grade

Fine-grain structural steel after quenching and tempering

## Products description

S690Q – structural high-strength steel with minimum yield strength of 690 MPa supplied in quenched and tempered condition (Q). Plates of S690 steel grade comply with EN 10025-6 standard. It is typically used in structures bearing extreme loads – in the production of mining and heavy construction equipment, crane facilities, offshore drilling rigs and supports for offshore wind mills as well as in the construction of bridges and trestles.

## Available dimensions

Plates of S690 steel grade are available with thicknesses of 8-100 mm for Q and QL quality groups and with thicknesses of 8-50 mm for QL1 quality group. Available width of plates is up to 3200 mm, length – up to 12200 mm. With the plate thickness of 100 mm and plate width of 1600 mm, the maximum length is 7500 mm\*. Plates with thickness up to 50 mm are supplied with edges trimmed, with thickness of 51 to 100 mm – with the edge flame cut.

\* – maximum weight is 9,5 ton

## Mechanical properties under EN 10025-6

| Steel grade    | Thickness, mm | Yield strength, min MPa | Tensile strength, MPa | Elongation, min % |
|----------------|---------------|-------------------------|-----------------------|-------------------|
| S690Q, QL, QL1 | ≥8 t ≤50      | 690                     | 770-940               | 14                |
| S690Q, QL      | >50 t ≤100    | 650                     | 760-930               | 14                |

| Steel grade | Impact energy KV, min J |     |     |     |
|-------------|-------------------------|-----|-----|-----|
|             | 0                       | -20 | -40 | -60 |
| S690Q       | 40                      | 30  | -   | -   |
| S690QL      | 50                      | 40  | 30  | -   |
| S690QL1     | 60                      | 50  | 40  | 30  |

## Chemical composition (max %)

According to EN 10025-6

| C    | Si   | Mn   | P           | S           | N     | B     | Cr   | Cu   | Mo   | Nb   | Ni   | V    |
|------|------|------|-------------|-------------|-------|-------|------|------|------|------|------|------|
| 0.20 | 0.80 | 1.70 | 0.020-0.025 | 0.010-0.015 | 0.015 | 0.005 | 1.50 | 0.50 | 0.70 | 0.06 | 2.00 | 0.12 |

According to Metinvest production

| C    | Si   | Mn   | P     | S     | N     | B     | Cr   | Cu   | Mo   | Nb   | Ni   | V    |
|------|------|------|-------|-------|-------|-------|------|------|------|------|------|------|
| 0.19 | 0.35 | 1.15 | 0.015 | 0.006 | 0.009 | 0.002 | 0.65 | 0.30 | 0.50 | 0.03 | 0.90 | 0.07 |

## Carbon equivalent

| Thickness, mm | CEV        |                      |
|---------------|------------|----------------------|
|               | EN 10025-6 | Metinvest production |
| < 50          | 0.65       | 0.59                 |
| > 50          | 0.77       | 0.73                 |

$$CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Cu+Ni}{15}$$

## Tolerances

|                           |                               |
|---------------------------|-------------------------------|
| <b>Thickness</b>          | According to EN 10029 Class A |
| <b>Length and width</b>   | According to EN 10029         |
| <b>Flatness</b>           | According to EN 10029 Class N |
| <b>Surface properties</b> | According to EN 10163 Class A |

## Welding

Steels specified in this document possess limited weldability properties since steel behavior before and after welding depends not only on the material, but its dimensions and shapes as well as operating conditions of goods.

General requirements to arc welding of steels specified herein shall be in line with EN 1011-2.

## Contacts

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