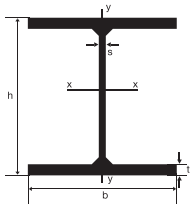


**EL  STRON**

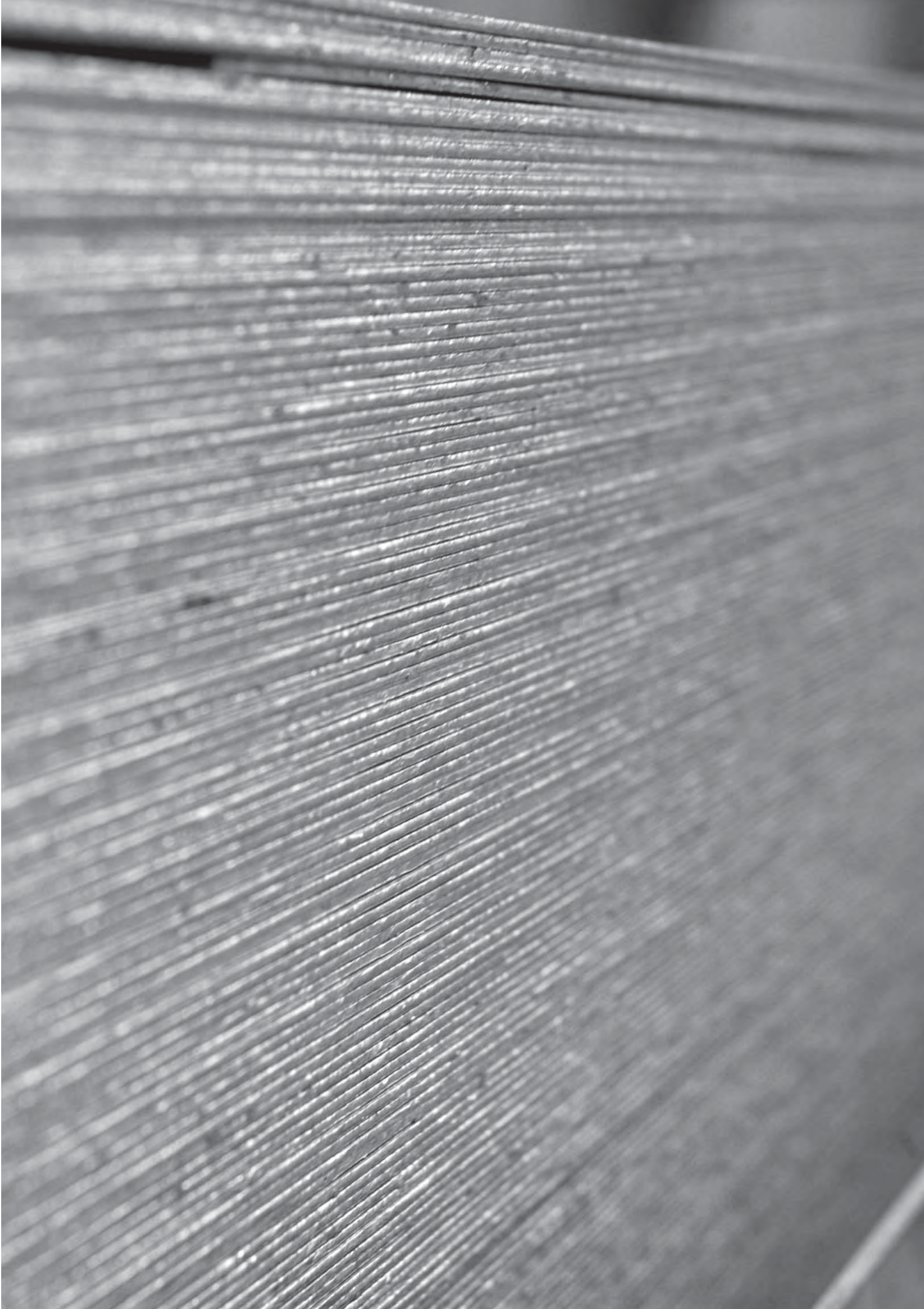
STEEL SERVICE CENTERS

## HEB BEAMS IPB (DIN 1025-2) S275 JR & S355 (EN10025)

Tolerances in accordance with EN 10034



| HEB  | Dimensions |        |        |        | Cross section        | Weight   | Resisting moment                  |                                   |
|------|------------|--------|--------|--------|----------------------|----------|-----------------------------------|-----------------------------------|
|      | h (mm)     | b (mm) | s (mm) | t (mm) | F (cm <sup>2</sup> ) | G (kg/m) | W <sub>x</sub> (cm <sup>3</sup> ) | W <sub>y</sub> (cm <sup>3</sup> ) |
| 100  | 100        | 100    | 6.0    | 10.0   | 26.0                 | 20.4     | 89.9                              | 33.5                              |
| 120  | 120        | 120    | 6.5    | 11.0   | 34.0                 | 26.7     | 144.0                             | 52.9                              |
| 140  | 140        | 140    | 7.0    | 12.0   | 43.0                 | 33.7     | 216.0                             | 78.5                              |
| 160  | 160        | 160    | 8.0    | 13.0   | 54.3                 | 42.6     | 311.0                             | 111.0                             |
| 180  | 180        | 180    | 8.5    | 14.0   | 65.3                 | 51.2     | 426.0                             | 151.0                             |
| 200  | 200        | 200    | 9.0    | 15.0   | 78.1                 | 61.3     | 570.0                             | 200.0                             |
| 220  | 220        | 220    | 9.5    | 16.0   | 91.0                 | 71.5     | 736.0                             | 258.0                             |
| 240  | 240        | 240    | 10.0   | 17.0   | 106.0                | 83.2     | 938.0                             | 327.0                             |
| 260  | 260        | 260    | 10.0   | 17.5   | 118.0                | 93.0     | 1150.0                            | 395.0                             |
| 280  | 280        | 280    | 10.5   | 18.0   | 131.0                | 103.0    | 1380.0                            | 471.0                             |
| 300  | 300        | 300    | 11.0   | 19.0   | 149.0                | 117.0    | 1680.0                            | 571.0                             |
| 320  | 320        | 300    | 11.5   | 20.5   | 161.0                | 127.0    | 1930.0                            | 616.0                             |
| 340  | 340        | 300    | 12.0   | 21.5   | 171.0                | 134.0    | 2160.0                            | 646.0                             |
| 360  | 360        | 300    | 12.5   | 22.5   | 181.0                | 142.0    | 2400.0                            | 676.0                             |
| 400  | 400        | 300    | 13.5   | 24.0   | 198.0                | 155.0    | 2880.0                            | 721.0                             |
| 450  | 450        | 300    | 14.0   | 26.0   | 218.0                | 171.0    | 3550.0                            | 781.0                             |
| 500  | 500        | 300    | 14.5   | 28.0   | 239.0                | 187.0    | 4290.0                            | 842.0                             |
| 550  | 550        | 300    | 15.0   | 29.0   | 254.0                | 199.0    | 4970.0                            | 872.0                             |
| 600  | 600        | 300    | 15.5   | 30.0   | 270.0                | 212.0    | 5700.0                            | 902.0                             |
| 650  | 650        | 300    | 16.0   | 31.0   | 286.0                | 231.0    | 6480.0                            | 932.0                             |
| 700  | 700        | 300    | 17.0   | 32.0   | 306.0                | 247.0    | 7340.0                            | 963.0                             |
| 800  | 800        | 300    | 17.5   | 33.0   | 334.0                | 269.0    | 8980.0                            | 994.0                             |
| 900  | 900        | 300    | 18.5   | 35.0   | 371.0                | 298.0    | 10980.0                           | 1050.0                            |
| 1000 | 1000       | 300    | 19.0   | 36.0   | 400.0                | 322.0    | 12890.0                           | 1090.0                            |





# CERTIFICATE

**Management system as per  
EN ISO 9001 : 2008  
Quality Management Systems - Requirements**

In accordance with TÜV HELLAS (TÜV NORD) S.A procedures, it is hereby certified that  
**ELASTRON S.A.  
Head Offices and Aspropyrgos Manufacturing Plant:  
Diylistirion Ave. Ag. Ioannis  
19 300 Aspropyrgos**

**Skaramaga Manufacturing Plant:  
1, Palaska Str.  
124 62 Skaramagas  
Greece**

applies a Management System in line with the above standard for the following scope

## Trade and Processing of Steel Products

Certificate Registration No.041050100  
Audit Report No. E-0405/2011

Initial certification 2005

TÜV HELLAS (TÜV NORD) S.A. Certification Body

Athens, 2011-06-05

This certification was conducted in accordance with the TÜV HELLAS S.A. auditing and certification procedures and is subject to regular surveillance audits.



INTERNATIONAL COMPARISON OF STANDARDS

| EN             |        | EN 10025:1990<br>+A1:1993 | EN 10025:1990 | GERMANY   | FRANCE              | U.K.    | SPAIN                 | ITALY              | BELGIUM               | SWEDEN            | PORTUGAL            | AUSTRIA          | NORWAY    |
|----------------|--------|---------------------------|---------------|-----------|---------------------|---------|-----------------------|--------------------|-----------------------|-------------------|---------------------|------------------|-----------|
| EN 1005-2:2004 | S185   |                           |               |           |                     |         |                       |                    |                       |                   |                     |                  |           |
| S185           | 1.0035 | S185                      | Fe 310-0      | St 33     | NF A 35-501<br>A 33 | BS 4360 | UNE 36-080<br>A 310-0 | UNI 7070<br>Fe 320 | NBN A 21-101<br>A 320 | SS 14<br>13 00-00 | NP 1729<br>Fe 310-0 | N 3116<br>St 320 |           |
|                |        | S235JR                    | Fe 360 B      | St 37 - 2 | E24-2               |         |                       | Fe 360 B           | AE 235-B              | 13 11-00          | Fe 360-B            |                  | NS 12 120 |
|                |        | S235JRG1                  | Fe 360 BFN    | Ust 37-2  |                     |         | AE 235<br>B-FU        |                    |                       |                   |                     | Ust 360 B        | NS 12 122 |
| S235JR         | 1.0038 | S235JRG2                  | Fe 360 BFN    | RSt 37-2  |                     | 40B     | AE 235<br>B- FN       |                    |                       | 13 12-00          |                     | Rst 360 B        | NS 12 123 |
| S235JO         | 1.0114 | S235JO                    | Fe 360 C      | St 37-3 U | E24-3               | 40C     | AE 235 C              | Fe 360 C           | AE 235-C              |                   | Fe 360-C            | St 360 C         | NS 12 124 |
|                |        |                           |               |           |                     |         |                       |                    |                       |                   | Fe 360-CE           |                  |           |
|                |        | S235J2G3                  | Fe 360 D1     | St 37-3 N | E24-4               | 40D     | AE 235 D              | Fe 360 D           | AE 235-D              |                   | Fe 360-D            | St 360 D         | NS 12 124 |
| S235J2         | 1.0117 | S235J2G4                  | Fe 360 D2     |           |                     |         |                       |                    |                       |                   |                     |                  |           |
| S275JR         | 1.0044 | S275JR                    | Fe 430 B      | St 44-2   | E 28-2              | 43B     | AE 275 B              | Fe 430 B           | AE 255-B              | 14 12-00          | Fe 430-B            | St 430 B         | NS 12 142 |
| S275JO         | 1.0043 | S275JO                    | Fe 430 C      | St 44-3 U | E 28-3              | 43C     | AE 275 C              | Fe 430 C           | AE 255-C              |                   | Fe 430-C            | St 430 C         | NS 12 143 |
|                |        |                           |               |           |                     |         |                       |                    |                       |                   |                     | St 430 CE        |           |
|                |        | S275JOG3                  | Fe 430 D1     | St 44-3 N | E 28-4              | 43D     | AE 275 D              | Fe 430 D           | AE 255-D              | 14 14-00          | Fe 430-D            | St 430 D         | NS 12 143 |
| S275J2         | 1.0145 | S275JOG4                  | Fe 430 D2     |           |                     |         |                       |                    |                       |                   |                     |                  |           |
| S355JR         | 1.0045 | S355JR                    | Fe 510 B      |           | E 36-2              | 50B     | AE 355 B              | Fe 510 B           | AE 355-B              |                   | Fe 510-B            |                  |           |
| S355JO         | 1.0553 | S355JO                    | Fe 510 C      | St 52-3 U | E 36-3              | 50C     | AE 355 C              | Fe 510 C           | AE 355-C              |                   | Fe 510-C            | St 51C           | NS 12 153 |
|                |        | S355J2G3                  | Fe 510 D1     | St 52-3N  |                     | 50D     | AE 355D               | Fe 510 D           | AE 355-D              |                   | Fe 510-D            | St 51 D          | NS 12 153 |
| S355J2         | 1.0577 | S355J2G4                  | Fe 510 D2     |           |                     |         |                       |                    |                       |                   |                     |                  |           |
|                |        | S355K2G3                  | Fe 510 DD1    |           | E 36-4              | 50DD    |                       |                    | AE 355-DD             |                   | Fe 510-DD           |                  |           |
| S355K2         | 1.0596 | S355K2G4                  | Fe 510 DD2    |           |                     |         |                       |                    |                       |                   |                     |                  |           |
| S450JO         | 1.0590 |                           |               |           |                     | 55C     |                       |                    |                       |                   |                     |                  |           |
| E295           | 1.0050 | E295                      | Fe 490 - 2    | St 50-2   | A 50-2              |         | A 490                 | Fe 490             | A 490-2               | 15 50-00          | Fe 490-2            | St 490           |           |
|                |        |                           |               |           |                     |         |                       |                    |                       | 15 50-01          |                     |                  |           |
| E335           | 1.0060 | E335                      | Fe 590 - 2    | St 60-2   | A 60-2              |         | A 590                 | Fe 590             | A 590-2               | 16 50 00          | Fe 590-2            | St 590           |           |
|                |        |                           |               |           |                     |         |                       |                    |                       | 16 50 01          |                     |                  |           |
| E360           | 1.0070 | E360                      | Fe 690 - 2    | St 70-2   | A 70-2              |         | A 690                 | Fe 690             | A 690-2               | 16 55 00          | Fe 690-2            | St 690           |           |
|                |        |                           |               |           |                     |         |                       |                    |                       | 16 55 01          |                     |                  |           |

## CHEMICAL COMPOSITION OF THE PRODUCT ANALYSIS

| Designation                        |                      | Method of deoxidation <sup>b</sup> | C in % max. for nominal product thickness in mm |                   |                   | Si % max. | Mn % max. | P % max. <sup>d</sup> | S % max. <sup>d,e</sup> | N % max. <sup>f</sup> | Cu % max. <sup>g</sup> | Other % max. <sup>h</sup> |
|------------------------------------|----------------------|------------------------------------|---|-------------------|-------------------|-----------|-----------|-----------------------|-------------------------|-----------------------|------------------------|---------------------------|
| According EN 10027-01 and CR 10260 | According EN 10027-2 |                                    | ≤ 16  | > 16 ≤ 40         | > 40 <sup>c</sup> |           |           |                       |                         |                       |                        |                           |
| S235JR                             | 1.0038               | FN                                 | 0,19  | 0,19              | 0,23              | -         | 1,50      | 0,045                 | 0,045                   | 0,014                 | 0,60                   | -                         |
| S235J0                             | 1.0114               | FN                                 | 0,19  | 0,19              | 0,19              | -         | 1,50      | 0,040                 | 0,040                   | 0,014                 | 0,60                   | -                         |
| S235J2                             | 1.0117               | FF                                 | 0,19  | 0,19              | 0,19              | -         | 1,50      | 0,035                 | 0,035                   | -                     | 0,60                   | -                         |
| S275JR                             | 1.0044               | FN                                 | 0,24  | 0,24              | 0,25              | -         | 1,60      | 0,045                 | 0,045                   | 0,014                 | 0,60                   | -                         |
| S275J0                             | 1.0143               | FN                                 | 0,21  | 0,21              | 0,23 <sup>i</sup> | -         | 1,60      | 0,040                 | 0,040                   | 0,014                 | 0,60                   | -                         |
| S275J2                             | 1.0145               | FF                                 | 0,21  | 0,21              | 0,23 <sup>i</sup> | -         | 1,60      | 0,035                 | 0,035                   | -                     | 0,60                   | -                         |
| S355JR                             | 1.0045               | FN                                 | 0,27  | 0,27              | 0,27              | 0,60      | 1,70      | 0,045                 | 0,045                   | 0,014                 | 0,60                   | -                         |
| S355J0                             | 1.0553               | FN                                 | 0,23 <sup>j</sup>                               | 0,23 <sup>k</sup> | 0,24              | 0,60      | 1,70      | 0,040                 | 0,040                   | 0,014                 | 0,60                   | -                         |
| S355J2                             | 1.0577               | FF                                 | 0,23 <sup>j</sup>                               | 0,23 <sup>k</sup> | 0,24              | 0,60      | 1,70      | 0,035                 | 0,035                   | -                     | 0,60                   | -                         |
| S355K2                             | 1.0596               | FF                                 | 0,23 <sup>j</sup>                               | 0,23 <sup>k</sup> | 0,24              | 0,60      | 1,70      | 0,035                 | 0,035                   | -                     | 0,60                   | -                         |
| S450J0 <sup>l</sup>                | 1.0590               | FF                                 | 0,23  | 0,23 <sup>k</sup> | 0,24              | 0,60      | 1,80      | 0,040                 | 0,040                   | 0,027                 | 0,60                   | <sup>m</sup>              |

<sup>b</sup> FN = rimming steels not permitted; FF = fully killed steel

<sup>c</sup> For sections with nominal thickness > 100 mm the C content by agreement.

<sup>d</sup> For long products the P and S content can be 0,005% higher.

<sup>e</sup> For long products the max. S content can be increased for improved machinability by 0,015% by agreement if the steel is treated to modify the sulphide morphology and the chemical composition shows min. 0,0020% Ca.

<sup>f</sup> The max. value for nitrogen does not apply if the chemical composition shows a minimum total Al content of 0,015% or alternatively min. 0,013% acid soluble Al or if sufficient other N binding elements are present. In this case the N binding elements shall be mentioned in the inspection document.

<sup>g</sup> Cu content above 0,45% may cause hot shortness during hot forming.

<sup>h</sup> If other elements are added, they shall be mentioned on the inspection document.

<sup>i</sup> For nominal thickness > 150 mm: C = 0,22% max.

<sup>j</sup> For grades suitable for cold roll forming C = 0,24% max.

<sup>k</sup> For nominal thickness > 30 mm: C = 0,24% max.

<sup>l</sup> Applicable for long products only.

<sup>m</sup> The steel may show a Nb content of max. 0,06%, a V content of max. 0,15% and a Ti content of max. 0,06%.

(according to EN10025)

## MECHANICAL PROPERTIES AT AMBIENT TEMPERATURE FOR FLAT AND LONG PRODUCTS OF STEEL GRADES AND QUALITIES WITH VALUES FOR THE IMPACT STRENGTH

| Designation                       |                      | Minimum yield strength R <sub>eH</sub> <sup>a</sup><br>MPa <sup>b</sup><br>Nominal thickness mm |           |           |           |            |             |             |             |                          |            | Tensile strength R <sub>m</sub> <sup>a</sup><br>MPa <sup>b</sup><br>Nominal thickness mm |             |             |                          |  |
|-----------------------------------|----------------------|---|-----------|-----------|-----------|------------|-------------|-------------|-------------|--------------------------|------------|--|-------------|-------------|--------------------------|--|
| According EN 10027-1 and CR 10260 | According EN 10027-2 | ≤ 16  | > 16 ≤ 40 | > 40 ≤ 63 | > 63 ≤ 80 | > 80 ≤ 100 | > 100 ≤ 150 | > 150 ≤ 200 | > 200 ≤ 250 | > 250 ≤ 400 <sup>c</sup> | > 3        | ≥ 3 ≤ 100  | > 100 ≤ 150 | > 150 ≤ 250 | > 250 ≤ 400 <sup>c</sup> |  |
| S235JR                            | 1.0038               | 235   | 225       | 215       | 215       | 215        | 195         | 185         | 175         | -                        | 360 to 510 | 360 to 510   | 350 to 500  | 340 to 490  | -                        |  |
| S235J0                            | 1.0114               | 235   | 225       | 215       | 215       | 215        | 195         | 185         | 175         | -                        | 360 to 510 | 360 to 510   | 350 to 500  | 340 to 490  | -                        |  |
| S235J2                            | 1.0117               | 235   | 225       | 215       | 215       | 215        | 195         | 185         | 175         | 165                      | 360 to 510 | 360 to 510   | 350 to 500  | 340 to 490  | 330 to 480               |  |
| S275JR                            | 1.0044               | 275   | 265       | 255       | 245       | 235        | 225         | 215         | 205         | -                        | 430 to 580 | 410 to 560   | 400 to 540  | 380 to 540  | -                        |  |
| S275J0                            | 1.0143               | 275   | 265       | 255       | 245       | 235        | 225         | 215         | 205         | -                        | 430 to 580 | 410 to 560   | 400 to 540  | 380 to 540  | -                        |  |
| S275J2                            | 1.0145               | 275   | 265       | 255       | 245       | 235        | 225         | 215         | 205         | 195                      | 430 to 580 | 410 to 560   | 400 to 540  | 380 to 540  | 380 to 540               |  |
| S355JR                            | 1.0045               | 355   | 345       | 355       | 325       | 315        | 295         | 285         | 275         | -                        | 510 to 680 | 470 to 630   | 450 to 600  | 450 to 600  | -                        |  |
| S355J0                            | 1.0553               | 355   | 345       | 355       | 325       | 315        | 295         | 285         | 275         | -                        | 510 to 680 | 470 to 630   | 450 to 600  | 450 to 600  | -                        |  |
| S355J2                            | 1.0577               | 355   | 345       | 355       | 325       | 315        | 295         | 285         | 275         | 265                      | 510 to 680 | 470 to 630   | 450 to 600  | 450 to 600  | 450 to 600               |  |
| S355K2                            | 1.0596               | 355   | 345       | 355       | 325       | 315        | 295         | 285         | 275         | 265                      | 510 to 680 | 470 to 630   | 450 to 600  | 450 to 600  | 450 to 600               |  |
| S450J0 <sup>d</sup>               | 1.0590               | 450   | 430       | 410       | 390       | 380        | 380         | -           | -           | -                        | -          | 550 to 720   | 530 to 700  | -           | -                        |  |

<sup>a</sup> For plate and wide flats with widths ≥ 600 mm the direction transverse (t) to the rolling applies. For all other products the values apply for the direction parallel (l) to the rolling direction.

<sup>b</sup> 1 MPa = 1 N/mm<sup>2</sup>.

<sup>c</sup> The values apply to flat products.

<sup>d</sup> Applicable for long products only.

(according to EN10025)

## MECHANICAL PROPERTIES AT AMBIENT TEMPERATURE FOR FLAT AND LONG PRODUCT OF STEEL GRADES AND QUALITIES WITH VALUES FOR THE IMPACT STRENGTH (CONCLUDED)

| Designation                       |                      | Position of test pieces <sup>a</sup> | Minimum percentage elongation after fracture <sup>a</sup><br>% |              |              |              |              |   |              |               |                |                |                                       |
|-----------------------------------|----------------------|--------------------------------------|--|--------------|--------------|--------------|--------------|---|--------------|---------------|----------------|----------------|---------------------------------------|
|                                   |                      |                                      | L <sub>0</sub> = 80 mm Nominal thickness mm                    |              |              |              |              | L <sub>0</sub> = 5,65 √S <sub>0</sub><br>Nominal thickness mm |              |               |                |                |                                       |
| According EN 10027-1 and CR 10260 | According EN 10027-2 |                                      | ≤ 1  | > 1<br>≤ 1,5 | > 1,5<br>≤ 2 | > 2<br>≤ 2,5 | > 2,5<br>< 3 | ≥ 3<br>≤ 40   | > 40<br>≤ 63 | > 63<br>≤ 100 | > 100<br>≤ 150 | > 150<br>≤ 250 | > 250°<br>≤ 400 only<br>for J2 and K2 |
| S235JR                            | 1.0038               | l                                    | 17   | 18           | 19           | 20           | 21           | 26  | 25           | 24            | 22             | 21             | -                                     |
| S235J0                            | 1.0114               |                                      |  |              |              |              |              |   |              |               |                |                | -                                     |
| S235J2                            | 1.0117               | t                                    | 15   | 16           | 17           | 18           | 19           | 24  | 23           | 22            | 22             | 21             | 21 (l and t)                          |
| S275JR                            | 1.0044               | l                                    | 15   | 16           | 17           | 18           | 19           | 23  | 22           | 21            | 19             | 18             | -                                     |
| S275J0                            | 1.0143               |                                      |  |              |              |              |              |   |              |               |                |                | -                                     |
| S275J2                            | 1.0145               | t                                    | 13   | 14           | 15           | 16           | 17           | 21  | 20           | 19            | 19             | 18             | 18 (l and t)                          |
| S355JR                            | 1.0045               | l                                    | 14   | 15           | 16           | 17           | 18           | 22  | 21           | 20            | 18             | 17             | -                                     |
| S355J0                            | 1.0553               |                                      |  |              |              |              |              |   |              |               |                |                | -                                     |
| S355J2                            | 1.0577               |                                      |  |              |              |              |              |   |              |               |                |                | 17 (l and t)                          |
| S355K2                            | 1.0596               | t                                    | 12   | 13           | 14           | 15           | 16           | 20  | 19           | 18            | 18             | 17             | 17 (l and t)                          |
| S450J0 <sup>d</sup>               | 1.0590               | l                                    | -  | -            | -            | -            | -            | 17  | 17           | 17            | 17             | -              | -                                     |

<sup>a</sup> For plate, strip and wide flats with widths ≥ 600 mm the direction transverse (t) to the rolling direction applies. For all other products the values apply for the direction parallel (l) to the rolling direction.

<sup>c</sup> The values apply to flat products.

<sup>d</sup> Applicable for long product only.

(according to EN10025)

