

|                        |                          |                      |
|------------------------|--------------------------|----------------------|
| <b>Quality</b>         | <b>S355J2</b> (Fe 510 D) | <i>Lucefin Group</i> |
| According to standards | <b>EN 10025-2: 2004</b>  |                      |
| Number                 | <b>1.0577</b>            |                      |

## Chemical composition

| C%                                                                                                   | Si%  | Mn%  | P%    | S%    | N% | Cu%  |                         |
|------------------------------------------------------------------------------------------------------|------|------|-------|-------|----|------|-------------------------|
| max                                                                                                  | max  | max  | max   | max   |    | max  |                         |
| 0,20 <sup>a)</sup>                                                                                   | 0,55 | 1,60 | 0,025 | 0,025 | -- | 0,40 | <b>Cast analysis</b>    |
| 0,23 <sup>a)</sup>                                                                                   | 0,60 | 1,70 | 0,035 | 0,035 | -- | 0,45 | <b>Product analysis</b> |
| Metod of deoxidation FF fully killed steel.                                                          |      |      |       |       |    |      | S355J2 n° 1.0579        |
| <sup>a)</sup> max 0.22 by ladle analysis, max 0.24 of the product for thickness over 30 mm to 100 mm |      |      |       |       |    |      | P% - S% max 0.030       |
| <sup>a)</sup> for nominal thickness > 100 mm the C content by agreement                              |      |      |       |       |    |      | cast analysis           |

## Temperature °C

| Hot forming                                                                     | Normal treatment               | Soft annealing                        | Isothermal annealing            | Temperature values are valid for analysis close to: |                                       |           |           |
|---------------------------------------------------------------------------------|--------------------------------|---------------------------------------|---------------------------------|-----------------------------------------------------|---------------------------------------|-----------|-----------|
| 1100-850                                                                        | natural                        | 700 air<br>(HB max 180)               | --                              | C%                                                  | Mn%                                   | Si%       |           |
|                                                                                 |                                |                                       |                                 | ~ 0.18                                              | ~ 1.20                                | ~ 0.30    |           |
| In some cases the piece can be normalized and tempered or quenched and tempered |                                |                                       |                                 | <b>Preheating welding</b>                           | <b>Stress relieving after welding</b> |           |           |
| <b>Normalizing and Tempering</b>                                                | <b>Quenching and Tempering</b> | <b>Stress relieving</b>               | <b>End quench hardenability</b> | 100                                                 | slow cooling                          |           |           |
| 920 air                                                                         | 880-900 water                  | 50 under the temperature of tempering | --                              |                                                     |                                       |           |           |
| 550-650 air                                                                     | 550-650 air                    |                                       |                                 | <b>Ac1</b>                                          | <b>Ac3</b>                            | <b>Ms</b> | <b>Mf</b> |
|                                                                                 |                                |                                       |                                 | --                                                  | --                                    | --        | --        |

## Mechanical properties

**Hot formed – hot rolled - rod** EN 10025-2: 2004 **S355J2**

Testing at room temperature Kv -20 °C

| size mm                                     |     | R                 | size mm |     | ReH                   | size mm |     | A% L                             | A% T | HB                     |
|---------------------------------------------|-----|-------------------|---------|-----|-----------------------|---------|-----|----------------------------------|------|------------------------|
| over                                        | to  | N/mm <sup>2</sup> | over    | to  | N/mm <sup>2</sup> min | over    | to  | min                              | min  | <i>for information</i> |
|                                             | 3   | 510-680           |         | 16  | 355                   | 3       | 40  | 22                               | 20   | 154-208                |
| 3                                           | 100 | 470-630           | 16      | 40  | 345                   | 40      | 63  | 21                               | 19   | 141-192                |
| 100                                         | 150 | 450-600           | 40      | 63  | 335                   | 63      | 100 | 20                               | 18   | 135-178                |
| 150                                         | 250 | 450-600           | 63      | 80  | 325                   | 100     | 150 | 18                               | 18   | 135-178                |
| 250                                         | 400 | 450-600           | 80      | 100 | 315                   | 150     | 250 | 17                               | 17   | 135-178                |
| --                                          | --  | --                | 100     | 150 | 295                   | 250     | 400 | 17                               | 17   |                        |
| --                                          | --  | --                | 150     | 200 | 285                   | over    | to  | Kv L - 20 °C <sup>a)</sup> J min |      |                        |
| <b>Mod. of elasticity</b> N/mm <sup>2</sup> |     |                   | 200     | 250 | 275                   |         | 150 | 27                               |      |                        |
| <b>E long.</b>                              |     | <b>G tang.</b>    | 250     | 400 | 265                   |         | 150 | 250                              | 27   |                        |
| 220000                                      |     | 84000             | --      | --  | --                    |         | 250 | 400                              | 27   |                        |

<sup>a)</sup> For sections with a nominal thickness >100 mm the values shall be agreed . ( a normalization is advised )

| <b>Cold drawn +C</b> EN 10277-2: 2008 <b>S355J2C</b> 1.0579 |     |                   |                       |     |                        | <b>Hot rolled – Peeled- Reeled +SH</b>     |                       |     |         |
|-------------------------------------------------------------|-----|-------------------|-----------------------|-----|------------------------|--------------------------------------------|-----------------------|-----|---------|
| Testing at room temperature (longitudinal)                  |     |                   |                       |     |                        | Testing at room temperature (longitudinal) |                       |     |         |
| size mm                                                     |     | R <sup>b)</sup>   | Rp 0.2 <sup>b)</sup>  | A%  | HB                     | R                                          | Rp 0.2                | A%  | HB      |
| over                                                        | to  | N/mm <sup>2</sup> | N/mm <sup>2</sup> min | min | <i>for information</i> | N/mm <sup>2</sup>                          | N/mm <sup>2</sup> min | min |         |
| 5 <sup>c)</sup>                                             | 10  | 630-950           | 520                   | 6   | 192-286                | --                                         | --                    | --  | --      |
| 10                                                          | 16  | 580-880           | 450                   | 7   | 172-263                | --                                         | --                    | --  | --      |
| 16                                                          | 40  | 530-850           | 350                   | 8   | 156-253                | 470-630                                    | --                    | --  | 146-187 |
| 40                                                          | 63  | 500-770           | 335                   | 9   | 152-231                | 470-630                                    | --                    | --  | 146-187 |
| 63                                                          | 100 | 470-740           | 315                   | 9   | 141-224                | 470-630                                    | --                    | --  | 146-187 |

<sup>b)</sup> for flats and special sections yield point can be – 10% and tensile strenght can be ± 10%

<sup>c)</sup> for thickness below 5 mm mechanical properties can be agreed before order placement .

Values valid also for +C+SL and +SH+SL

**Forged normalized** EN 10250-2: 2001 **S355J2G3** n° 1.0570 (Fe 510 D)

Tensile test at room temperature Kv at - 20°C ( the normalizing is advised )

| size |     | R                     | Re                    | A% L | A% T | Kv L - 20 °C | Kv T - 20 °C | HB         |
|------|-----|-----------------------|-----------------------|------|------|--------------|--------------|------------|
| over | to  | N/mm <sup>2</sup> min | N/mm <sup>2</sup> min | min  | min  | J min        | J min        | <i>min</i> |
|      | 100 | 490                   | 315                   | 20   | --   | 35           | --           | 149        |
| 100  | 250 | 450                   | 275                   | 18   | 12   | 30           | 20           | 135        |
| 250  | 500 | 450                   | 265                   | 18   | 12   | 27           | 15           | 135        |

| EUROPE EN | ITALY UNI | CHINA GB | GERMANY DIN | FRANCE AFNOR | U.K. BS | RUSSIA GOST | USA AISI/SAE |
|-----------|-----------|----------|-------------|--------------|---------|-------------|--------------|
| S355J2    | Fe 510 D  | --       | St 52-3 N   | --           | 50 D    | 17G1S       | A 350 LF2    |