

# S350GD + ZM310

MAGNELIS® STEEL

| STANDARD                   | EN 10346  |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|----------------------------|---|----------------------------|----------------------------|--------------------------|--------------|----------------------|------------|-----------------|--------|-----------------|-----------------|----------------------|--------|-----------------|--------|-----------------|-----------------|---------------------|-----|-----------------|------|-----------------|------|-----------------|--------|-----------------|-------|-----------------|--------------|-----------------|-----------------|-----------------|---|-----------------|---|-----------------|-----------------|--|--|
| IDENTIFICATION NUMBER      | -   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| CLASSIFICATION             | -   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| TYPE                       | -   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ROLLING STATE              | -   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| BRIEF DESCRIPTION          | -   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| APPLICATIONS               | From civil to industrial construction - From agriculture to zootechnics - Construction of support structures for solar panels - Lightweight structures made of structural steel - Road infrastructure   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| STANDARD COIL STOCK RANGE  | <table border="1"> <thead> <tr> <th>S350GD +ZM310</th> <th>1000</th> <th>1250</th> <th>1500</th> </tr> </thead> <tbody> <tr> <td>0,6</td> <td></td> <td></td> <td></td> </tr> <tr> <td>0,8</td> <td></td> <td></td> <td>•</td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>1,2</td> <td></td> <td></td> <td>•</td> </tr> <tr> <td>1,5</td> <td></td> <td></td> <td>•</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>•</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td>•</td> </tr> <tr> <td>4</td> <td></td> <td></td> <td>•</td> </tr> </tbody> </table>   | S350GD +ZM310              | 1000                       | 1250                     | 1500         | 0,6                  |            |                 |        | 0,8             |                 |                      | •      | 1               |        |                 |                 | 1,2                 |     |                 | •    | 1,5             |      |                 | •      | 2               |       |                 | •            | 3               |                 |                 | • | 4               |   |                 | •               |  |  |
| S350GD +ZM310              | 1000  | 1250                       | 1500                       |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 0,6                        |   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 0,8                        |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 1                          |   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 1,2                        |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 1,5                        |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 2                          |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 3                          |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| 4                          |   |                            | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| COATING                    | <table border="1"> <thead> <tr> <th>Coating</th> <th>Weight (g/m<sup>2</sup>)</th> <th>Thickness (µm per side)*</th> <th>Shaped</th> </tr> </thead> <tbody> <tr> <td>ZM120</td> <td>120</td> <td>10</td> <td></td> </tr> <tr> <td>ZM175</td> <td>175</td> <td>14</td> <td></td> </tr> <tr> <td>ZM200</td> <td>200</td> <td>16</td> <td></td> </tr> <tr> <td>ZM250</td> <td>250</td> <td>20</td> <td></td> </tr> <tr> <td>ZM310</td> <td>310</td> <td>25</td> <td>•</td> </tr> <tr> <td>ZM430</td> <td>430</td> <td>35</td> <td></td> </tr> </tbody> </table> <p><i>*The density of Magnelis® coating is 6,2 g/cm<sup>3</sup></i></p>  | Coating                    | Weight (g/m <sup>2</sup> ) | Thickness (µm per side)* | Shaped       | ZM120                | 120        | 10              |        | ZM175           | 175             | 14                   |        | ZM200           | 200    | 16              |                 | ZM250               | 250 | 20              |      | ZM310           | 310  | 25              | •      | ZM430           | 430   | 35              |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| Coating                    | Weight (g/m <sup>2</sup> )  | Thickness (µm per side)*   | Shaped                     |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM120                      | 120   | 10                         |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM175                      | 175   | 14                         |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM200                      | 200   | 16                         |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM250                      | 250   | 20                         |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM310                      | 310   | 25                         | •                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ZM430                      | 430   | 35                         |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| CHEMICAL COMPOSITION       | <p>Regulatory standard</p> <table border="1"> <thead> <tr> <th>C (%)</th> <th>Si (%)</th> <th>Mn (%)</th> <th>P (%)</th> <th>S (%)</th> <th>Al (%)</th> <th>Nb (%)</th> <th>Ti (%)</th> <th>V (%)</th> <th>Mo (%)</th> <th>Cu (%)</th> </tr> </thead> <tbody> <tr> <td>≤ 0,20</td> <td>≤ 0,60</td> <td>≤ 1,70</td> <td>≤ 0,100</td> <td>≤ 0,045</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Cr (%)</th> <th>Ni (%)</th> <th>N (%)</th> <th>B (%)</th> <th>Nb+Ti+V (%)</th> <th>Cr+Mo+Ni (%)</th> <th>Ni+Cr+Cu+Mo (%)</th> <th>C.E.V. (%)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>  | C (%)                      | Si (%)                     | Mn (%)                   | P (%)        | S (%)                | Al (%)     | Nb (%)          | Ti (%) | V (%)           | Mo (%)          | Cu (%)               | ≤ 0,20 | ≤ 0,60          | ≤ 1,70 | ≤ 0,100         | ≤ 0,045         |                     |     |                 |      |                 |      | Cr (%)          | Ni (%) | N (%)           | B (%) | Nb+Ti+V (%)     | Cr+Mo+Ni (%) | Ni+Cr+Cu+Mo (%) | C.E.V. (%)      |                 |   |                 |   |                 |                 |  |  |
| C (%)                      | Si (%)  | Mn (%)                     | P (%)                      | S (%)                    | Al (%)       | Nb (%)               | Ti (%)     | V (%)           | Mo (%) | Cu (%)          |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| ≤ 0,20                     | ≤ 0,60  | ≤ 1,70                     | ≤ 0,100                    | ≤ 0,045                  |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| Cr (%)                     | Ni (%)  | N (%)                      | B (%)                      | Nb+Ti+V (%)              | Cr+Mo+Ni (%) | Ni+Cr+Cu+Mo (%)      | C.E.V. (%) |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| MECHANICAL PROPERTIES      | <table border="1"> <thead> <tr> <th>Mechanical characteristics</th> <th>Direction</th> <th>Thicknesses</th> <th>Values</th> </tr> </thead> <tbody> <tr> <td rowspan="3">R<sub>e</sub> (MPa)</td> <td rowspan="3">L</td> <td>≥ 0,45 - 0,50 ≤</td> <td rowspan="3">≥ 350</td> </tr> <tr> <td>≥ 0,50 - 0,70 ≤</td> </tr> <tr> <td>≥ 0,70 - 6,00 ≤</td> </tr> <tr> <td rowspan="3">R<sub>m</sub> (MPa)</td> <td rowspan="3">L</td> <td>≥ 0,45 - 0,50 ≤</td> <td rowspan="3">≥ 420</td> </tr> <tr> <td>≥ 0,50 - 0,70 ≤</td> </tr> <tr> <td>≥ 0,70 - 6,00 ≤</td> </tr> <tr> <td rowspan="3">A<sub>80</sub> (%)</td> <td rowspan="3">L</td> <td>≥ 0,45 - 0,50 ≤</td> <td>≥ 12</td> </tr> <tr> <td>≥ 0,50 - 0,70 ≤</td> <td>≥ 14</td> </tr> <tr> <td>≥ 0,70 - 6,00 ≤</td> <td>≥ 16</td> </tr> <tr> <td rowspan="3">r<sub>90</sub></td> <td rowspan="3">L</td> <td>≥ 0,45 - 0,50 ≤</td> <td rowspan="3">-</td> </tr> <tr> <td>≥ 0,50 - 0,70 ≤</td> </tr> <tr> <td>≥ 0,70 - 6,00 ≤</td> </tr> <tr> <td rowspan="3">n<sub>90</sub></td> <td rowspan="3">L</td> <td>≥ 0,45 - 0,50 ≤</td> <td rowspan="3">-</td> </tr> <tr> <td>≥ 0,50 - 0,70 ≤</td> </tr> <tr> <td>≥ 0,70 - 6,00 ≤</td> </tr> </tbody> </table> <p><i>L = Tensile testing carried out on longitudinal test pieces</i></p> | Mechanical characteristics | Direction                  | Thicknesses              | Values       | R <sub>e</sub> (MPa) | L          | ≥ 0,45 - 0,50 ≤ | ≥ 350  | ≥ 0,50 - 0,70 ≤ | ≥ 0,70 - 6,00 ≤ | R <sub>m</sub> (MPa) | L      | ≥ 0,45 - 0,50 ≤ | ≥ 420  | ≥ 0,50 - 0,70 ≤ | ≥ 0,70 - 6,00 ≤ | A <sub>80</sub> (%) | L   | ≥ 0,45 - 0,50 ≤ | ≥ 12 | ≥ 0,50 - 0,70 ≤ | ≥ 14 | ≥ 0,70 - 6,00 ≤ | ≥ 16   | r <sub>90</sub> | L     | ≥ 0,45 - 0,50 ≤ | -            | ≥ 0,50 - 0,70 ≤ | ≥ 0,70 - 6,00 ≤ | n <sub>90</sub> | L | ≥ 0,45 - 0,50 ≤ | - | ≥ 0,50 - 0,70 ≤ | ≥ 0,70 - 6,00 ≤ |  |  |
| Mechanical characteristics | Direction   | Thicknesses                | Values                     |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| R <sub>e</sub> (MPa)       | L   | ≥ 0,45 - 0,50 ≤            | ≥ 350                      |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,50 - 0,70 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,70 - 6,00 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| R <sub>m</sub> (MPa)       | L   | ≥ 0,45 - 0,50 ≤            | ≥ 420                      |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,50 - 0,70 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,70 - 6,00 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| A <sub>80</sub> (%)        | L   | ≥ 0,45 - 0,50 ≤            | ≥ 12                       |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,50 - 0,70 ≤            | ≥ 14                       |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,70 - 6,00 ≤            | ≥ 16                       |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| r <sub>90</sub>            | L   | ≥ 0,45 - 0,50 ≤            | -                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,50 - 0,70 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,70 - 6,00 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| n <sub>90</sub>            | L   | ≥ 0,45 - 0,50 ≤            | -                          |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,50 - 0,70 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
|                            |   | ≥ 0,70 - 6,00 ≤            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| TOLERANCES                 | Tolerances on the dimensions and on the shape UNI EN 10143  |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |
| CERTIFICATIONS             | EN 10204-3.1 CE / Declaration of Performance  |                            |                            |                          |              |                      |            |                 |        |                 |                 |                      |        |                 |        |                 |                 |                     |     |                 |      |                 |      |                 |        |                 |       |                 |              |                 |                 |                 |   |                 |   |                 |                 |  |  |