HOT-ROLLED QUALITY STEEL SHEETS

SAEY 235 | S 355 MC | S 420 MC | S 500 MC | S 700 MC | S 690 QL

For laser cutting, cold forming, weight saving

option:

SAEY STEEL SERVICE CENTER

Laser Form®
STEEL TECHNOLOGY AT ITS BEST

COIL PRODUCTION

The steel industry has been making pioneering progress in recent years:

- the chemical composition of steel is becoming ever more pure and the use of microalloys increasingly better controlled,
- computer control of the rolling process (CVC rolling cylinders, laser measurement of flatness, rolling temperature control) allows extraordinary accuracy to be achieved.

Continuous control of the rolling cylinders ensures optimum flatness and profile of the sheets.

DECOILING

Apart from producing the metal on high-tech facilities, decoiling is crucial to obtain a sheet ideal for processing.

In conventional decoiling, the metal is levelled by passing between adjustable rollers. It is hereby essential to

CONCLUSION

SAEY 235 Laserform® and SAEY S 355 MC Laserform® are ideal substitutes for S 235 JR + AR and S 355 J2 + N respectively.

The use of SAEY 235, S 355 MC and sheets with a higher yield point is witnessing spectacular growth because of the significant cost savings they offer:
The result is **fine grained steel** that far exceeds regular steel:
- its mechanical properties are far superior and more constant between production batches,
- its quality properties, dimensional tolerances and flatness are much tighter and more constant.

Hot-rolled sheets made of this fine grained steel are therefore eminently **recommended for**:
- laser and plasma cutting, punching,
- bending, deep drawing and cold forming,
- weight saving when using sheets with a high yield point. (The yield point denotes the maximum permissible load in Newton/mm² that does not cause permanent deformation).

without affecting weldability, galvanizability and ageing resistance.

Several of these steel grades have been standardized under the EN 10149 standard, one example being the S 355 MC. The SAEY 235 Laserform® sheets, by contrast, are a **unique SAEY product**, developed in collaboration with the most advanced steel producers and design offices of customers with exceptionally stringent quality requirements.

work right through to the core of the metal to eliminate all **internal tensions**. And yet, for technical reasons, this is sometimes only partially achieved. That is why we see an apparently perfectly flat sheet releasing its tension, for example, when cutting long, narrow blanks.

To avoid this risk, SAEY offers to **stretch** its LaserForm® sheets during decoiling. Courtesy of this revolutionary technique, our laser sheets are THE benchmark in terms of **low-tension sheets for critical applications**.

- faster processing of the material
  (exceptional quality)
- less scrap and machine breakdown
  (automatic processing with LaserForm®)
- weight saving on the final product
  (targeted introduction of high yield)
MORE EFFICIENT
LASER CUTTING
PLASMA CUTTING
PUNCHING

PROPERTIES

- Faster laser or plasma cutting

The refined chemical composition allows for faster cutting, also as a result of the low silicon content which ensures optimum flowability of the material being melted by the burner. (Excessive flowability resulting in too wide a cut and energy loss of the burner must be avoided). This is especially apparent on thick plates.

- A beautiful surface and clean cuts

The surface is blue from the rolling. The rolling skin is thinner and adheres well. In some applications, the pickled version can even substitute cold-rolled sheet. (Pickled available up to 12 mm thick!) The low silicon content reduces burr and ensures neat and smooth cuts.

On request, black sheets can be brushed to obtain an unsurpassed surface that allows even faster laser cutting.

COST SAVINGS

- Material savings

  - Fewer rejects due to release of tensions.
  - In some applications, pickled sheets can even be used as substitute for more expensive cold rolled sheets.

- Increased machine productivity

  - Faster burning (in some cases even two sheets on top of each other).
  - Fewer machine failures which result in lost time and often expensive damage.
Exceptional flatness

Maximum 3 mm/m before processing (≠ S 700 MC)

If you opt for our Laserform®LESS TENSION®, we can guarantee you, upon request, a maximum flatness of 2 mm/m before processing.

Better flatness offers the following advantages:
- automatic machine loading occurs without any problems
- the cutter heads are not damaged
- flatness and accuracy of the cut parts improve
- in some cases two sheets placed on top of each other can be cut simultaneously with the laser: an enormous gain in productivity!

Absence of tensions

The highly advanced rolling process and temperature control during production reduce internal tensions to an absolute minimum. During burning or punching the material remains flat.

Are you still confronted with internal tensions when processing sheet metal?

On request, SAEY can stretch the Laserform® sheets. By working the sheet through to the core of the metal, the risk of release of residual tensions is reduced to an absolute minimum, while maintaining the metal structure intact.

Increased machine operator productivity

- Neat, burrless parts do not require further finishing.
- The thicknesses and mechanical properties are much more constant over different batches.

Recurrent orders can be carried out by retrieving the machine parameters of previous series, resulting in shorter set-up times.

Uniformity of properties brings down costs!
BETTER BENDING & COLD FORMING

PROPERTIES

- Substantially lower phosphorus and sulphur content than specified by the EN standard. Increases bendability and cold formability.

![Exceptional bendability and cold formability](image)

- Improved elongation

<table>
<thead>
<tr>
<th></th>
<th>S 235 JR + AR</th>
<th>SAEY 235</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. elongation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_0 = 5d$</td>
<td>longitudinal</td>
<td>26%</td>
</tr>
<tr>
<td>(thickness ≥ 3 mm)</td>
<td>transverse</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>S 355 J2 + N</th>
<th>S 355 MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. elongation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$L_0 = 5d$</td>
<td>longitudinal</td>
<td>22%</td>
</tr>
<tr>
<td>(thickness ≥ 3 mm)</td>
<td>transverse</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23%</td>
</tr>
</tbody>
</table>

COST SAVINGS

- Material savings

Bending in all directions allows for optimized use of the sheets and therefore reduces waste.

- Replacing deep drawing sheets for presswork

SAEY 235 Laserform® allows light deep drawing. It can replace DD11 and in many cases DD12. A cost-effective solution.

- Less welding

When using regular steel, final products with complex shapes often need to be welded from different pieces. With fine grained steel the final product can usually be manufactured from one piece without welding.
**Sharper bend radius**

<table>
<thead>
<tr>
<th></th>
<th>S 235 JR + AR</th>
<th>SAEY 235 ≤ 6 mm</th>
<th>&gt; 6 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended bending diameter (bending test 180°)</td>
<td>longitudinal 1a</td>
<td>0.3a</td>
<td>0.5a</td>
</tr>
<tr>
<td></td>
<td>transverse 2a</td>
<td>0.3a</td>
<td>0.5a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>S 355 J2 + N</th>
<th>S 355 MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended bending diameter (bending test 180°)</td>
<td>longitudinal 2.5a</td>
<td>0.5a</td>
</tr>
<tr>
<td></td>
<td>transverse 3a</td>
<td>0.5a</td>
</tr>
</tbody>
</table>

Transverse bending is possible with a bending diameter that is up to six times smaller than with regular structural steel.

**Bending in all directions**

The fine grain steel structure allows both longitudinal and transverse bending with excellent results. The rolling direction no longer needs to be taken into account in bending work.

**Bending in all directions without problems.**

**Shortening machine set-up times!**

The thicknesses of the sheets fall within a much closer range than specified by the standard. As a result, for bent parts it is easier to observe the external dimensions that are indicated on the drawing. Moreover, the thicknesses and mechanical properties are much more constant over different batches. Recurrent parts can thus easily be manufactured by retrieving the machine parameters of previous series for each new order. This results in very substantial time gains for bending machine and press operators.

Uniform properties bring down costs!

**Avoiding hot forming**

The better cold formability allows the cold forming of complex shapes that were previously only possible by hot forming. This results in considerable time and energy savings.

**You can also call on SAEY for:**

- assistance with strength calculation *
- simulation of use of high-strength steel * (finite elements)
- application for possible subsidies *

* in cooperation with KAHOSL
SAVING WEIGHT
OR STRENGTHENING
STRUCTURES

**PROPERTIES**

- Very high yield point and yet highly cold formable!

Higher yield points than with S 235 JR + AR are possible, without affecting cold formability. To this end, the steel is microalloyed and subjected to thermo-mechanical treatment during rolling.

<p>| EN 10025  | Yield point  | Tensile strength  | Min. Elongation %  | Bending diameter  |</p>
<table>
<thead>
<tr>
<th>EN 10149-2</th>
<th>ReH (N/mm²)</th>
<th>Rm (N/mm²)</th>
<th>Lₐ = 5 d₀ (≥ 3 mm)</th>
<th>(a = plate thickness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 235 JR + AR</td>
<td>min. 235</td>
<td>340 à 470</td>
<td>24 transverse / 26 longitudinal</td>
<td>2a transverse / 1a longitudinal</td>
</tr>
<tr>
<td>S 355 MC</td>
<td>min. 355</td>
<td>430 à 550</td>
<td>20 transverse / 22 longitudinal</td>
<td>3a transverse / 2,5a longitudinal</td>
</tr>
<tr>
<td>QStE 380 TM (SEW 092)</td>
<td>min. 380</td>
<td>450 à 590</td>
<td>23</td>
<td>0,5a</td>
</tr>
<tr>
<td>S 420 MC</td>
<td>min. 420</td>
<td>480 à 620</td>
<td>19</td>
<td>0,5a</td>
</tr>
<tr>
<td>S 460 MC</td>
<td>min. 460</td>
<td>520 à 670</td>
<td>17</td>
<td>1a</td>
</tr>
<tr>
<td>S 500 MC</td>
<td>min. 500</td>
<td>550 à 700</td>
<td>14</td>
<td>1a</td>
</tr>
<tr>
<td>St 60-2 / A 60-2 (E 335)</td>
<td>min. 335</td>
<td>570 à 710</td>
<td>14 transverse / 16 longitudinal</td>
<td>much larger</td>
</tr>
<tr>
<td>S 550 MC</td>
<td>min. 550</td>
<td>600 à 760</td>
<td>14</td>
<td>1,5a</td>
</tr>
<tr>
<td>St 70-2 / A 70-2 (E 360)</td>
<td>min. 365</td>
<td>670 à 830</td>
<td>10 transverse / 11 longitudinal</td>
<td>much larger</td>
</tr>
<tr>
<td>S 650 MC*</td>
<td>min. 650</td>
<td>700 à 880</td>
<td>13</td>
<td>2a</td>
</tr>
<tr>
<td>S 700 MC*</td>
<td>min. 700</td>
<td>750 à 950</td>
<td>12</td>
<td>2a</td>
</tr>
</tbody>
</table>

* At a thickness above 8 mm the yield point may be 20 N/mm² lower.

Fine grain steel with high yield point is far more bendable than traditional steel with high tensile strength.

**COST SAVINGS**

- **Material savings** (thanks to a high yield point)

The higher yield points allow the use of thinner plates while preserving the solidity and tensile strength of the structures. The resulting weight reduction allows significant material savings.

In simplified terms, it can be said that when doubling the yield point the plate thickness may be reduced by one-third (in applications with bent parts).

Or still: \( t₂ = \sqrt{\frac{\text{yield point mat.1}}{\text{yield point mat.2}}} \)
\( t₃ = \text{thickness} \)
mat. 1 = reference steel grade (e.g. S 235 JR + AR)
mat. 2 = steel with high yield point
Ex.: Plate S 235 JR + AR of 10 mm thick can be replaced with plate S 700 MC of 6 mm:
\( t₂ = \sqrt{\frac{235}{690}} \)
\( t₂ = 5,83 \)
A saving of no less than 40 %!

- **New cost-effective profiles** (thanks to good cold formability)

Conventional structural steel with high tensile strength is difficult to bend and profiles often need to be hot formed or welded, which is expensive. Fine grain steel, by contrast, bends easily and opens up new possibilities for inexpensive cold profiling and weight saving.

You can also call on SAEY for:

- assistance with strength calculation *
- simulation of use of high-strength steel * (finite elements)
- application for possible subsidies *

* in cooperation with KAHOSL

Reducing welding costs

Using thinner sheets means thinner welds. And therefore reduced consumption of welding metal as well as time savings.

Fine grain steel opens up new opportunities in the design of light structures!
- **Highly weldable**

The pure chemical composition ensures a low carbon equivalent. Welding is easier than with conventional structural steel with high tensile strength and high carbon equivalent.

- **Extraordinarily dent resistant**

These fine grain quality steels exhibit superior toughness which makes them suitable for applications where dent resistance is a premium: tilting skips, dumpers, garbage trucks, etc.

![Lighter yet solid and dent resistant.](source: WAF N.V.)

Extraordinarily dent resistant.

- **Increased performance of rolling stock**

Weight savings are crucial for trucks, trailers, containers: a lower dead weight allows for a higher loading capacity and lower fuel consumption.

Cranes made of steel with high yield point also achieve higher lifting capacities.

![Increased performance of rolling stock.](source: MOL Cy. NV.)

Increased performance of rolling stock.

- **Increasing the solidity of the structure**

Where high-strength steel is used without reducing the thicknesses, the solidity of the product is increased. As a result, there is less wear and tear, maintenance and repair costs are reduced and the product has a longer lifetime.

![Increasing the solidity of the structure.](source: WAF N.V.)

Increasing the solidity of the structure.

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**COST SAVINGS**

The lower the weight, the higher the loading capacity and the lower the fuel consumption.

High-strength steel increases solidity and the lifting capacity.
SAEY 235 BLACK OR PICKLED

Properties

- Continuously cast mild structural steel: microalloyed, tempered, fine grained. Excellently cold-formable (low phosphor and sulphur content).
  - Low-tension and flat (manganese and sophisticated computer-controlled rolling).
  - Perfect for laser and plasma cutting (low silicon content).
- Has all properties of S 235 JR + AR and S 235 J2C + N, with improved elongation.
- Can replace DD 11 and in some cases DD12.
- The pickled version can in some cases substitute cold-rolled plates DC01.
- Highly weldable (low carbon and sulphur content): all common methods and conventional fillers can be used. Preheating is not necessary.
- Suitable for galvanization (low silicon and phosphorus content).
- Ageing resistant (aluminium and titanium).
- Better impact values than S 235 JR + AR.

SAEY S 355 MC BLACK OR PICKLED

Properties

  - High yield point yet highly cold-formable.
  - Low-tension and flat (manganese and sophisticated computer-controlled rolling). Excellent for laser and plasma cutting (low silicon content).
- Has all properties of S 355 J2 + N, with improved elongation and cold formability.
- Highly weldable (low carbon content, also thanks to Niobium): for detailed explanation, contact our technical experts.
- Suitable for galvanization (low silicon and phosphorus content).
- Ageing resistant (aluminium and titanium).
- Better impact values than S 235 JR + AR.
- Not suitable for hot forming.
  - May be annealed up to 580°C.
### Chemical analysis (%)

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>S</th>
<th>P</th>
<th>Al</th>
<th>Cu</th>
<th>Ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 10 mm</td>
<td>≤ 0,10</td>
<td>≤ 0,03</td>
<td>≤ 0,90</td>
<td>≤ 0,015</td>
<td>≤ 0,015</td>
<td>0,015 à 0,065</td>
<td>≤ 0,12</td>
<td>≤ 0,02</td>
</tr>
<tr>
<td>&gt; 10 mm</td>
<td>≤ 0,17</td>
<td>≤ 0,03</td>
<td>≤ 1,20</td>
<td>≤ 0,015</td>
<td>≤ 0,015</td>
<td>0,015 à 0,065</td>
<td>≤ 0,12</td>
<td>≤ 0,02</td>
</tr>
</tbody>
</table>

### Mechanical properties

<table>
<thead>
<tr>
<th>Steel Type</th>
<th>Yield point ReH (N/mm²)</th>
<th>Tensile strength Rm (N/mm²)</th>
<th>Min. Elongation % Lo= 5 d₀ (≤ 3mm)</th>
<th>Recommended bending diameter (a= plate thickness) (a ≥ 3 mm)</th>
<th>Impact value (min. 27 Joules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 235 JR + AR (≤ 16 mm)</td>
<td>min. 235</td>
<td>340 à 470</td>
<td>24 transverse / 26 longitudinal</td>
<td>2a transverse / 1a longitudinal</td>
<td>+ 20° C</td>
</tr>
<tr>
<td>SAEY 235</td>
<td>min. 235</td>
<td>340 à 450</td>
<td>min. 30% transverse &amp; longitudinal</td>
<td>0,3 a (≤ 6mm) 0,5 a (&gt; 6mm) transverse &amp; longitudinal</td>
<td>- 20° C</td>
</tr>
</tbody>
</table>

### Delivery condition

- Dimensional tolerances as per EN 10 051
  - Thickness: half the standard = the normal tolerance for cold-rolled sheet EN 10 131
- Flatness: 3 mm/m before processing, 2 mm/m on request with "STRETCH".
- Cut edges: upon request for the black sheets, generally from stock for pickled sheets (up to 6 mm)

### Chemical analysis (%)

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>S</th>
<th>P</th>
<th>Nb</th>
<th>Ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0,12</td>
<td>≤ 0,50</td>
<td>≤ 1,50</td>
<td>≤ 0,020</td>
<td>≤ 0,025</td>
<td>≤ 0,09</td>
<td>≤ 0,15</td>
<td></td>
</tr>
</tbody>
</table>

Depending on the manufacturer, this steel may contain Titanium and / or Niobium and other elements such as Aluminium or Vanadium. For all Saey Laserform®, silicon content ≤ 0.03% (or 0.04%).

### Mechanical properties

<table>
<thead>
<tr>
<th>Steel Type</th>
<th>Yield point ReH (N/mm²)</th>
<th>Tensile strength Rm (N/mm²)</th>
<th>Min. Elongation % Lo= 5 d₀ (≤ 3mm)</th>
<th>Recommended bending diameter (a= plate thickness) (a ≥ 3 mm)</th>
<th>Impact value (min. 27 Joules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 355 JR + N (≤ 16 mm)</td>
<td>min. 355</td>
<td>490 à 630</td>
<td>20 transverse / 22 longitudinal</td>
<td>3a transverse / 2,5a longitudinal</td>
<td>- 20° C</td>
</tr>
<tr>
<td>S 355 MC</td>
<td>min. 355</td>
<td>430 à 550 (event. + of - 20)</td>
<td>min. 23% transverse &amp; longitudinal</td>
<td>0,5 a transverse &amp; longitudinal</td>
<td>- 20° C</td>
</tr>
</tbody>
</table>

### Delivery condition

- Dimensional tolerances as per EN 10 051
  - Thickness: half the standard = the normal tolerance for cold-rolled sheet EN 10 131
- Flatness: 3 mm/m before processing, 2 mm/m on request with "STRETCH".
- Cut edges: upon request for the black sheets, generally from stock for pickled sheets (up to 6 mm)
**S 420 MC** (EN 10 149-2)

**Properties**
- Has all properties of S 355 J2 + N, with improved cold formability.
- Highly weldable (low carbon content, also thanks to Niobium): for detailed explanation, contact our technical experts.
- Suitable for galvanization (low silicon and phosphor content).
- Ageing resistant (aluminium and titanium).
- Better impact values than S235JR + AR and S 355 J2 + N.
- Not suitable for hot forming. May be annealed up to 580°C.

**S 500 MC** (EN 10 149-2)

**Properties**
- Covers St 70-2, with improved cold formability.
- When cutting it is advisable to grind the edges. Tables with blade distances available upon request.
- Highly weldable (low carbon equivalent). Preheating not necessary. Recommended reference cooling time: from 800° C to 500° C in maximum 15 seconds. Conventional fillers: specifications available upon request. Contact our technicians for details.
- Not suitable for hot forming. May be annealed up to 580°C.

**S 700 MC** (EN 10 149-2)

**Properties**
- Covers St 70-2, with improved cold formability.
- When cutting it is advisable to grind the edges. Tables with blade distances available upon request.
- Highly weldable (low carbon equivalent). Preheating not necessary. Recommended reference cooling time: from 800° C to 500° C in maximum 15 seconds. Conventional fillers: specifications available upon request. Contact our technicians for details.
- Not suitable for hot forming. May be annealed up to 580°C.
- Can be galvanized provided allowance is made for the fact that it has a higher silicon content than plates with lower yield point.
- Ageing resistant (aluminium and titanium).
- Better impact values than S 235 JR + AR and S 355 J2 + N. Therefore more dent resistant.
### Chemical analysis (%)

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>S</th>
<th>P</th>
<th>Nb</th>
<th>Ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0.12</td>
<td>≤ 0.50</td>
<td>≤ 1.60</td>
<td>≤ 0.015</td>
<td>≤ 0.0025</td>
<td>≤ 0.09</td>
<td>≤ 0.15</td>
</tr>
</tbody>
</table>

Depending on the manufacturer, this steel may contain Titanium and/or Niobium and other elements such as Aluminium or Vanadium. For all Saey LaserForm®, silicon content <0.03% (or 0.04%).

### Mechanical properties

<table>
<thead>
<tr>
<th>Yield point (R_{EH} (N/mm^2))</th>
<th>Tensile strength (R_m (N/mm^2))</th>
<th>Min. Elongation % (L_e = 5 \times d_{a} (\leq 3 \text{mm}))</th>
<th>Recommended bending diameter ((a=\text{plate thickness}) ((a \geq 3 \text{mm}))</th>
<th>Impact value (at -20° C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S 355 J2 + N ((\leq 16 \text{mm}))</strong></td>
<td>min. 355</td>
<td>490 à 630</td>
<td>20 transverse / 22 longitudinal</td>
<td>3a transverse / 2,5a longitudinal</td>
</tr>
<tr>
<td><strong>S 420 MC</strong></td>
<td>min. 420</td>
<td>480 à 620</td>
<td>19% transverse &amp; longitudinal</td>
<td>0,5 a transverse &amp; longitudinal</td>
</tr>
</tbody>
</table>

### Delivery condition
- Dimensional tolerances as per EN 10 051. Thickness: half the standard = the normal tolerance for cold-rolled sheet EN 10 131
- Flatness: 3 mm/m before processing, 2 mm/m on request with STRETCH.
- Cut edges: upon request

### Chemical analysis (%)

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
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<th>S</th>
<th>P</th>
<th>Nb</th>
<th>Ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0.12</td>
<td>≤ 0.60</td>
<td>≤ 2.10</td>
<td>≤ 0.015</td>
<td>≤ 0.025</td>
<td>≤ 0.09</td>
<td>≤ 0.22</td>
</tr>
</tbody>
</table>

Depending on the manufacturer, this steel may contain Aluminium or Vanadium, Molybdenum or Bor.

### Mechanical properties

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<thead>
<tr>
<th>Yield point (R_{EH} (N/mm^2))</th>
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<th>Min. Elongation % (L_e = 5 \times d_{a} (\leq 3 \text{mm}))</th>
<th>Recommended bending diameter ((a=\text{plate thickness}) ((a \geq 3 \text{mm}))</th>
<th>Impact value (at -20° C)</th>
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<tbody>
<tr>
<td><strong>S 420 MC</strong></td>
<td>min. 420</td>
<td>480 à 620</td>
<td>19% transverse &amp; longitudinal</td>
<td>0,5 a transverse &amp; longitudinal</td>
</tr>
<tr>
<td><strong>S 500 MC</strong></td>
<td>min. 500</td>
<td>550 à 700</td>
<td>14% transverse &amp; longitudinal</td>
<td>1 a transverse &amp; longitudinal</td>
</tr>
</tbody>
</table>

### Delivery condition
- Dimensional tolerances as per EN 10 051. Thickness: half the standard = the normal tolerance for cold-rolled sheet EN 10 131
- Flatness: we aim for 3 mm/m before processing
- Cut edges: upon request

### Chemical analysis (%)

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>S</th>
<th>P</th>
<th>Nb</th>
<th>Ti</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0.12</td>
<td>≤ 0.60</td>
<td>≤ 2.10</td>
<td>≤ 0.015</td>
<td>≤ 0.025</td>
<td>≤ 0.09</td>
<td>≤ 0.22</td>
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</tbody>
</table>

Depending on the manufacturer, this steel may contain Aluminium or Vanadium, Molybdenum or Bor.

### Mechanical properties

<table>
<thead>
<tr>
<th>Yield point (R_{EH} (N/mm^2))</th>
<th>Tensile strength (R_m (N/mm^2))</th>
<th>Min. Elongation % (L_e = 5 \times d_{a} (\leq 3 \text{mm}))</th>
<th>Recommended bending diameter ((a=\text{plate thickness}) ((a \geq 3 \text{mm}))</th>
<th>Impact value (at -20° C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S 355 J2 + N ((\leq 16 \text{mm}))</strong></td>
<td>min. 355</td>
<td>490 à 630</td>
<td>20 transverse / 22 longitudinal</td>
<td>3a transverse / 2,5a longitudinal</td>
</tr>
<tr>
<td><strong>St 70-2</strong></td>
<td>min. 365</td>
<td>670 à 830</td>
<td>10 transverse / 11 longitudinal</td>
<td>-</td>
</tr>
<tr>
<td><strong>S 700 MC</strong></td>
<td>min. 700*</td>
<td>750 à 950</td>
<td>12% longitudinal &amp; transverse</td>
<td>2a transverse &amp; longitudinal</td>
</tr>
</tbody>
</table>

* At a thickness above 8 mm the yield point may be lower by 20 N/mm².

### Delivery condition
- Dimensional tolerances as per EN 10 051 for the sheets from the hot strip and according to EN 10 029 for the quarto plates.
- Flatness: we aim for 8 mm/m before processing. Closer tolerance on request with STRETCH.
- Cut edges: upon request.
LARGE INVENTORIES
FOR US

Smaller inventories
for you!

Explanation:

* S xxx Jx + x
S: structural steel
xxx: minimum yield point value
Jx: Impact value
  JR: Impact value 27 Joule at 20°C
  JO: Impact value 27 Joule at 0°C
  J2: Impact value 27 Joule at -20°C
+ x: + AR: as rolled
   + N: normalised rolled
   or normalised after rolling

* S xxx MC
S: structural steel
xxx: minimum yield point value
M: thermomechanically rolled
C: cold-formable

* S xxx QL
S: structural steel
xxx: minimum yield point value
QL: impact value minimum 30 Joule at -40°C

* DD xx
1st D: sheet suitable for cold-forming
2nd D: hot-rolled, suitable for cold-forming
xx: indicates the various steel grades
11 = StW 22
12 = StW 23
13 = StW 24

SHEETS / COILS

BLACK - SAEY 235
Laser and bending processing
(supersedes S 235 JR + AR and DD 11)
(fine-grained mild steel, with high cold formability)
EN 10051 (flatness: 3 mm/m before processing, 2 mm/m on request)

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<tr>
<th>1</th>
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PICKLED - SAEY 235
Laser and bending processing
(supersedes S 235 JR + AR and DD 11)
(fine-grained mild steel, with high cold formability)
EN 10051 (flatness: 3 mm/m before processing, 2 mm/m on request)

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EN 10051 (flatness: 3 mm/m before processing, 2 mm/m on request)

BLACK - SAEY S 355 MC
(fine-grained steel with high yield point,
thermomechanically treated, with high cold formability)
EN 10051 (flatness: 3 mm/m before processing, 2 mm/m on request)

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QUARTO PLATES

BLACK - SAEY 235
(supersedes S 235 JR + AR)
(fine-grained mild steel, with high cold formability)
EN 10029

| 1500 x 3000 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2000 x 4000 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Symbols:
■ = continuous stock
● = regular stock
◆ = thin strip rolling
**DECOILING WITH SHORT DELIVERY TIMES**

<table>
<thead>
<tr>
<th>On request from coilstock</th>
<th>On request with mill delivery time</th>
</tr>
</thead>
<tbody>
<tr>
<td>- special lengths up to 24 m</td>
<td>- intermediate thicknesses up to 20 mm</td>
</tr>
<tr>
<td>- narrow length tolerances (up to -0/+2 mm)</td>
<td>- special widths up to 2200 mm</td>
</tr>
<tr>
<td>- precise quantity to match your project</td>
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<tr>
<td>- special packaging</td>
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<tr>
<td>- surface brush treatment (allows faster laser cutting)</td>
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<tr>
<td>- marking (ink)</td>
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</tbody>
</table>

**BLACK - SAEY S 355 MC of JR**
(fine-grained steel with high yield point, with high cold formability)
EN 10029

<table>
<thead>
<tr>
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<tr>
<td>2500 x 6000</td>
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</table>

A comparison of the old and new industry standards can be found in the online partner section of [www.saeysteel.com](http://www.saeysteel.com)
- Sheared blankings
- XABO plates
- Trailer flat (high yield)
- Wear-resistant plates XAR 400 (± 400 HB), XAR 500 (± 500HB)
- Fine-grained sheets for construction S355NL, S420NL …
- Sheet metal for construction S235J2 + N, S355J2+ N, C45E
- Ship plate, boiler plate P265GH, 16Mo3, etc.
- Weather-resistant steel COR-TEN A and B

WITH SHORT DELIVERY TIMES & NO MINIMUM ORDER QUANTITIES

WITH 3-WEEK DELIVERY TIME:
STRIP STEEL SLIT FROM COILS

- from 1.25 to 8 mm thickness from 20 mm width.

CALL ON SAEY ALSO FOR:

- Other sheets and plates (hot-rolled, pickled and oiled, cold rolled, hot-dipped galvanised, electro-galvanised)
- Merchant bars, beams, cold-drawn steel, cold-rolled profiles
- Tubes
- Laser cutting of tubes and other processing possibilities
- Tube accessories, fasteners and industrial ironware

SAEY
Solid partner,
Competitive solutions.

OFFICES + WAREHOUSE
Industrielaan 4, 8501 Kortrijk-Heule, Belgium
T +32 (0)56 35 42 00 F +32 (0)56 35 64 31
E info@saeysteel.com
BTW BE 0448 146 433

WAREHOUSE
Noordlaan 25, 8520 Kuurne, Belgium
www.saeysteel.com
Itinerary: www.saeysteel.com/en/contact