ArcelorMittal has developed lighter, thinner, stronger, and more durable steels, enabling the design of efficient and cost-effective structures.
Adding value to cold formed profiles with high strength steels

Cold formed steel profiles are important components of many steel buildings. Commonly used as secondary structures, these profiles are utilised between primary framing elements.

Secondary structural profiles distribute loads on the building’s surfaces to the main frame and foundations.

Cold formed profiles are used as purlins, sleeves, rafters, cleats, bracings, and all related accessories.

**Lighter**
Thickness and weight reduction combined with higher stiffness allows new design opportunities.

**Stronger**
Increase in load-bearing capacity.

**Longer spans**
Reduces the number of portals and increases open space.

**Cost-effective**
Reduced manufacturing costs.

**Durable**
Magnelis® or zinc coatings improve corrosion resistance for long-lasting structures. The steel is fully recyclable or reusable at end of life.
Two ranges of high strength steels for specific needs

ArcelorMittal offers two different ranges of metallic coated high strength steels: structural grades and high strength low alloy (HSLA) grades. The decision on which range to use depends on the final properties required.

- Structural grades offer minimal values for yield strength (in rolling direction).
- High strength low alloy (HSLA) grades offer a narrower range of mechanical properties and better formability (in transverse direction).

### Structural steel grades  
<table>
<thead>
<tr>
<th>Forming</th>
<th>No maximum value for YS and TS. Smaller elongation. Suitable for bending, profiling and punching.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding</td>
<td>Suitable for all types of welding.</td>
</tr>
</tbody>
</table>
| Piercing    | Higher risk with the use of self-piercing screws when TS is too high (no guaranteed higher limit).
| Toughness at low temperature |  |
| Fatigue     |                                                                                                  |

### HSLA steel grades

- Better formability for bending and drawing operations thanks to a smaller grain size, lower sulphur content, and lower inclusion rate.
- Improved arc-welding due to lower carbon content.
- Upper limit on TS value is better for piercing and screwing, especially with self-tapping screws.
- Better behaviour thanks to lower grain size and better metallurgical cleanliness.
- Better behaviour thanks to lower grain size.

### Structural steels

<table>
<thead>
<tr>
<th>Structural steel grades</th>
<th>High strength low alloy steels (HSLA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norm</td>
<td>YS (MPa)</td>
</tr>
<tr>
<td>S350GD</td>
<td>EN 10346</td>
</tr>
<tr>
<td>S390GD</td>
<td>EN 10346</td>
</tr>
<tr>
<td>S420GD</td>
<td>EN 10346</td>
</tr>
<tr>
<td>S450GD</td>
<td>EN10346</td>
</tr>
<tr>
<td>S550GD</td>
<td>EN10346</td>
</tr>
<tr>
<td>S450GD-HyPer*</td>
<td>ArcelorMittal</td>
</tr>
<tr>
<td>S420GD-HyPer</td>
<td>ArcelorMittal</td>
</tr>
</tbody>
</table>

* Guaranteed according to Eurocode 1993 for structural parts (A% > 15% and TS/YS > 1.1)
** Upper limit of tensile strength for easier piercing and screwing
*** On request for thicknesses below 2 mm

### Available dimensions

- Thickness: 0.70 to 4 mm
- Width: up to 1680 mm

Values for global offer, contact us for details by range.
In-use properties

Cold forming
High strength metallic coated steels show excellent cold forming ability. They are specifically designed for bending, profiling, punching, and light drawing operations. High YS/TS ratio prevents geometric distortion during forming linked to material springback. Metallic coated steels can be deformed easily, low bending radii should be avoided.

Assembling
High strength metallic coated steels are compatible with many commonly used metal joining techniques such as screwing and bolting.

Welding
High strength metallic coated steels can be welded using all conventional methods. Specific flux-cored wires are available for metallic coating.

Applications
> Building: roofing and cladding, framing, structural profiles (purlins, rails, sleeves, rafters, cleats, bracing, and all related accessories)
> Silos
> Solar framing
> Scaffolding tubes
> Trailers
> Chassis
> Wagons
> Racks
> Tubes

Coating and surface treatments

<table>
<thead>
<tr>
<th>Metallic and pre-painted coating (coating weight)</th>
<th>Oiled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot dip galvanised: from Z100 to Z800 (g/m²)</td>
<td>Magnelis®: from ZM90 to ZM430 (g/m²)</td>
</tr>
<tr>
<td>Magnelis®: from ZM90 to ZM430 (g/m²)</td>
<td>Aluzinc®: from AZ100 to AZ185 (g/m²)</td>
</tr>
<tr>
<td>Aluzinc®: from AZ100 to AZ185 (g/m²)</td>
<td>Granite® (pre-painted steel): up to 3 mm</td>
</tr>
</tbody>
</table>

Surface treatments
- O: Oiled
- C: E-passivation®
- SE: Easyfilm®

Surface finishes
- A or B

Values for global offer, contact us for details by range.

ArcelorMittal Europe – Flat Products
24-26, boulevard d’Avranches
L-1160 Luxembourg
industry.arcelormittal.com