



Drawn flat steel bars

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STEEL RANGE

| |
|---|
| Structural steels EN 10025-2-3-5 |
| Free cutting non-alloyed steels EN 10087 |
| Case hardening steels EN 10084 |
| Steels for quenching and tempering EN 10083-2-3 |
| Hot-rolled steels for quenched and tempered springs EN 10089 |
| Cold-finished steels EN 10277-2-3-4-5 |
| Steels for cold heading and cold extrusion EN 10263 |
| Micro-alloyed steels EN 10267 |
| Steels for pressure purposes EN 10273 - ASTM A105 - ASTM A350 |

Note: possibility of supplying steels in accordance with Customer specifications, to be agreed upon at the order stage.

PRODUCTION RANGE

MANUFACTURING SIZES

| | |
|----------------|---|
| Standard | Drawn flat bars: width from 35 to 300 mm with thickness from 6 to 90 mm (see enclosed shape list). Progression equal to 0.01 mm for width and 0.01 mm for thickness |
| Extra standard | Delivery of "radiused" or "bevelled" drawn flat steel products possible upon agreement with the operational unit. |

BAR LENGTH

| |
|---|
| 2.8 ÷ 6.8 m (including length+ tolerance) |
| Commercial length with range ≤ 1 m |
| Extra Standard Fixed Length with range -0/+200 mm or ± 100 mm |
| Extra Standard Fixed Length with range ≥ 50 mm |

Note: crop end, if agreed upon at the order, ≥ 3 m for $\leq 10\%$ of the ordered weight. It will be included in the supply if hot-rolled and separately wrapped if cold-rolled.

Possibility of supplying sandblasted drawn sections with length 2.8 ÷ 6.8 m (including the length+ tolerance)

DIMENSIONAL TOLERANCES: UNI EN 10277; UNI EN ISO 286; ASTM A108; BS 970

| | |
|----------------|--|
| Standard | Width ≤ 140 mm: IT11; Width > 140 mm: EN 10277 Thickness: IT11 |
| Extra standard | ASTM A108; BS 970. |

Note: full-length tolerances will have to be agreed upon at the order acquisition stage. For heat-treated products after drawing + sandblasting IT13.

STRAIGHTNESS

| | |
|----------------|---|
| Standard | $\leq 1,5\%$ for length ≤ 200 mm $\leq 2,0\%$ for length > 200 mm |
| Extra Standard | $\leq 1\%$ for length > 200 mm $\leq 1,5\%$ for length > 200 mm |

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ROUGHNESS

| | |
|----------|-------------|
| Standard | Ra ≤ 3,2 µm |
|----------|-------------|

END APPEARANCE

| | |
|----------------|--|
| Standard | Shear cutting for cutting cross-section < 50 mm or with one-end sawing machine for cutting cross-section ≥ 50 mm |
| Extra Standard | Cutting with sawing machine at both ends of the thickness. |

SUPERFICIAL DEFECTS

| | |
|----------|--------------------------------|
| Standard | Class 2 EN 10277 (Statistical) |
|----------|--------------------------------|

Note: semi-products can be previously subjected to US testing in accordance with standard EN 10308 Max Classe 3

DECARBONISATION

| | |
|----------|---|
| Standard | Max. 1% of the cross-section, with a minimum equal to 0.2 mm. |
|----------|---|

NON-METALLIC INCLUSIONS

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|----------------|---|
| Standard | Macro-purity at grade ≤ 2 as per S.E.P. 1584 standard. Micro-purity at grade ≤ 2.5 as per ASTM E 45 standard or with K method at the values of the EN 10083/06-1 standard, App E, Macro-segregation ≤ C3-R2-S2 as per ASTM E 381 standard |
| Extra Standard | Through the vacuum degassing (VD) process it is possible to obtain macro-inclusions falling into grade 0 of the S.E.P. 1584 standard. |

BANDING

| | |
|----------------|--|
| Standard | Maximum guaranteed banding as per Grade IV of the UNI 8449 standard. |
| Extra Standard | Through the vacuum degassing (VD) process, maximum guaranteed banding as per Grade III of the UNI 8449 standard. |

AUSTENITE GRAIN REFINING FOR SPECIAL STEELS

| | |
|----------------|--|
| Standard | 5 ÷ 8 austenite grain as per ASTM E112 or ISO 643 guaranteed. This grain size range is not guaranteed for general purpose structural steels, with the exception of the J2 types envisaged in the EN 10025-2 table. |
| Extra Standard | With extra standard process, 6 or finer austenite grain can be guaranteed. |

MECHANICAL CHARACTERISTICS AND HARDENABILITY

| | |
|----------------|---|
| Standard | In accordance with the standardisation table mentioned in the order. On request, all steels can be produced with hardenability restricted to 2/3 of the H standard band, i.e. in the HL (lower 2/3) and HH (upper 2/3) types. Reference for Jominy test: EN ISO 642 standard. |
| Extra Standard | In accordance with Customer specification, to be evaluated at the order acceptance stage. |

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MAGNETIC RETENTIVITY

| | |
|----------|----------------|
| Standard | Not guaranteed |
|----------|----------------|

PACKAGING

| | |
|----------------|---|
| Standard | <ul style="list-style-type: none">- Anti-corrosion oiling- 4 straps for 2.8÷5 m bundles. 4-6 straps for 5.5÷6.8 m bundles.- 1 Tag per bundle- Certified metal lifting rings |
| Extra Standard | <p>Peculiar conditions besides the previous ones, to be evaluated at the order acceptance stage.</p> <ul style="list-style-type: none">- 2 tags, 1 at the front and 1 at the rear of the bundle- Bundle packaging with polythene-jute cloth- Plates at the ends- Packaging in crates- Additional oiling and protective paper at the shipment stage. |

HEAT TREATMENTS

- Our products can be supplied with the following heat treatments:
- Softening annealing +A
 - +AC Globular annealing globular level guaranteed $\geq 70\%$
 - Stress-free annealing +SR
 - Annealing for ferrite-pearlite structure +FP
 - Normalising +N
 - Shearability annealing +S
 - Hardening field annealing +TH

BUNDLE WEIGHT

| | |
|----------------|------------------|
| Standard | 1,000 ÷ 1,600 kg |
| Extra standard | 500 Kg |

OTHER INFORMATION

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|---|---|
| Torsion | Max 1°/m |
| Radius of sharp edges | ≤ 0.2 mm for width ≤ 150 mm ≤ 0.5 mm for width > 150 mm |
| Hardness | Steels with hardness exceeding 245 HB must be previously annealed |
| Manufacturing times | 40 ÷ 60 days |
| Product certificate | Compliant with EN 10204 |
| Minimum batch size | 5 tons. |
| Weight tolerance with respect with the ordered amount | $\pm 20\%$ up to 5 tons. $\pm 10\%$ > 5 tons. |

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SHAPE LIST

