SSAB

# AR 500 ROUND BARS

## DEVELOPED FOR THE MOST CHALLENGING WEAR SITUATIONS

SSAB is now introducing the AR 500 round bars in different dimensions, targeting Ø 13–160 mm (0.512–6.299”). During the development process, these round bars are named AR (abrasion resistant). They will be branded Hardox® when all production properties consistently correspond to Hardox® wear plate.

| MATERIAL PROPERTIES | |
|---|---|
| **AR 500 round bar** | **Values*** |
| Hardness (HBW) | 470–530 |
| Toughness Charpy V (J) | Min 27 at -40° C<br>(20 ft-lb at -40° F) |
| Yield strength (MPa) | 1200 |
| Tensile strength (MPa) | 1700 |
| Max CET | 0.47 |
| A5 (%) | 12 |

*This product is under development and the data in this table are the typical values, taken from the existing limited available measurement.

# ROUND BAR PERFORMANCE THAT MEETS YOUR HIGHEST EXPECTATIONS

## The AR 500 round bars combine high hardness for extreme wear resistance and toughness for durability when exposed to high structural loads.

**Delivery condition**
Heat treated with rolled or turned conditions. Rolled surfaces are recommended as the stock is replenished only by rolled surface. Some round bars can be produced and delivered with turned surfaces and tight tolerances upon request.

**Diameter tolerances**
Aim diameters are 13-160 mm (0.512-6.299"). All diameter tolerances are according to EN 10060 or SSAB specification.

| Diameter, mm (in.) | Diameter tolerances | |
|---|---|---|
| | Rolled | Turned |
| 20-75 (0.787-2.953) | EN 10060 Normal | IT11 (or customer preference) |
| >75-160 (>2.953-6.299) | SSAB Specification | SSAB specification |

Turned Hardox® bars from production come with IT11. Tighter tolerances such as h11, h9, h6 and f8 are possible upon request.

| Diameter mm (in.) | Rolled mm (in.) |
|---|---|
| 13-15 (0.512-0.591) | ± 0.40 (0.016) |
| 16-25 (0.630-0.984) | ± 0.50 (0.020) |
| 26-35 (1.024-1.378) | ± 0.60 (0.024) |
| 36-50 (1.417-1.969) | ± 0.80 (0.031) |
| 52-80 (2.047-3.150) | ± 1.00 (0.039) |
| >80-115 (>3.150-4.528) | + 3.50 (0.138) |
| >100-119 (>3.937-4.685) | + 3.50 (0.138) |
| >120-150 (>4.724-5.906) | + 3.00 (0.118) |
| 160 (6.299) | + 3.50 (0.138) |

**Straightness**
Tolerances according to EN 10060. The maximum allowed deviation is 2 mm/m (0.079"/78"), when using a calibrated 1 meter (39.370") ruler.

**Ovality**
Tolerances for both rolled and turned bars according to EN 10060, meaning the deviation of roundness shall not exceed 75% of the diameter tolerance range.

**Length**
Tolerances for both rolled and turned bars with fixed length 5000 mm (196.850") with tolerances -0/+200 mm (+7.874"). Other lengths may be available upon request.

**Surface**
The tolerances for rolled bars are according to the most recent EN 10221 class C for Ø ≤ 75 mm (2.953") and for turned are according to the most recent EN 10221 class C for Ø ≤ 120 mm (4.724"). For bars with Ø > 120 mm (4.724") the maximum depth of surface discontinuities is 0.0075 x Ø mm.

**Testing**
Bar hardness is measured on a milled surface, with indents positioned as impact test according to EN 10083. Impact toughness, Charpy V-notch test positioning is taken according to EN 10083.

# AR 500 ROUND BAR PROPERTIES ARE STATE-OF-THE-ART

| Comparison table | St 4140 Q&T, typical values | | | AR 400, typical values | AR 500, typical values |
|---|---|---|---|---|---|
| Diameter, mm (in.) | >16-40 (>0.630-1.575) | >40-100 (>1.575-3.937) | >100-160 (>3.937-6.299) | 13-160 (0.512-6.299) | 13-160 (0.512-6.299) |
| Yield strength Rp0.2 (MPa) | 750 | 650 | 550 | 1000 | 1200 |
| Tensile strength Rm (MPa) | 1100 | 1000 | 900 | 1350 | 1700 |
| A5(%) | 11 | 12 | 13 | 13 | 12 |
| Impact toughness (J) (ft-lb.) Ch-V at RT | 35 (25.815) | 35 (25.815) | 35 (25.815) | 130 (95.883) | 65 (47.942) |
| Impact toughness (J) (ft-lb.) Ch-V at -40°C | - | - | - | 65 (47.942) | 27 (19.914) |
| C (% typical) | 0.42 | 0.42 | 0.42 | 0.30 | 0.32 |
| CEV | 0.79 max | 0.79 max | 0.79 max | 0.58 max | 0.63 max |

SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on Nasdaq Stockholm and has a secondary listing on Nasdaq Helsinki.

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