ArcelorMittal

# Drawn Bars
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## Safe and Sustainable Steel Solutions

ArcelorMittal operates in over 60 countries, producing Long, Flat, and Stainless Steels. It provides integrated solutions for major global markets including automotive, construction, appliances, packaging, and more.
Sustainability, quality, and leadership are ArcelorMittal's commitments in the pursuit of excellence in every product and service, offering increasingly customized steel solutions.

## High-Quality Steel for the World's Leading Markets

Strict control and the continuous incorporation of cutting-edge equipment ensure that ArcelorMittal's Drawn Bars meet the demands of increasingly competitive markets.

Quality is present in every process, supported by a quality management system certified by the world's most rigorous standards. Drawn Bars are produced at ArcelorMittal units in Sabará (MG) and Rio das Pedras (SP).

# Drawn Bars

ArcelorMittal's product quality standards are also present in the range of Drawn Bars made from Wire Rod and Hot Rolled Bars.

ArcelorMittal's Drawn Bars are used in the manufacturing of shafts, fasteners, tools, Coil Springs, shock absorber rods, parts for the mechanical industry in general, and agricultural and road implements.

**The Drawn Bars are available in the following shapes and sizes:**

- Round: in diameters from 4.76 mm to 77.79 mm
- Hexagonal: from 5.00 mm to 38.10 mm

## Inspection – Circograph, Defectomat, and Magnaflux

Modern in-line automatic inspection equipment ensures the depth of surface defects complies with the specifications outlined in the standard (ABNT NBR 8647:2024), as described in the table below:

## Maximum allowable depth of surface defects in drawn bars

| Nominal Dimension Dn[a] mm | Finishing Process |
|---|---|
| | Maximum Depth of Surface Defects mm |
| 3 < Dn ≤ 10 | 0.20 |
| 10 < Dn ≤ 18 | 0.25 |
| 18 < Dn ≤ 30 | 0.30 |
| 30 < Dn ≤ 50 | 0.50 |
| 50 < Dn ≤ 80 | 0.70 |
| 80 < Dn ≤ 100 | 0.90 |

# Round Drawn Bars for Various Applications

Specifications: SAE 1006 to 1080 and low alloy steels SAE 5140, 4140, 8620, 31CrV3, etc.

## Targeted Sizes and Tolerances

- Tolerances: h9, h10, and h11
- Length: from 3 m to 6 m; other lengths available upon request
- Length tolerance:
  - › Diameters from 4.76 to 39.00 mm: -0/+50 mm
  - › Diameters from 39.01 to 77.79 mm: -0/+300 mm
- Straightness tolerance available upon request

| Nominal Dimension Dn mm | Lower Tolerance mm | | |
|---|---|---|---|
| | h9 | h10 | h11 |
| 3 < Dn ≤ 6 | 0.030 | 0.048 | 0.075 |
| 6 < Dn ≤ 10 | 0.036 | 0.058 | 0.090 |
| 10 < Dn ≤ 18 | 0.043 | 0.070 | 0.110 |
| 18 < Dn ≤ 30 | 0.052 | 0.084 | 0.130 |
| 30 < Dn ≤ 50 | 0.062 | 0.100 | 0.160 |
| 50 < Dn ≤ 80 | 0.074 | 0.120 | 0.190 |

## Packaging

They are packaged in round bundles, strapped with steel bands over polypropylene plastic strips, with weights ranging from 1.0 t to 2.0 t, depending on the bar diameter.

## Certification

All materials are accompanied by a Quality Certificate.

# Round Drawn Bars for Coil Springs and Stabilizer Bars

Specifications: SAE 5160, SAE 9254, and DIN 38Mn6

## Targeted Sizes and Tolerances

Available in diameters from 9.00 mm to 31.75 mm and  normally specified with H10 tolerance, according to ISO standards.

## Straightness

The maximum specified straightness deviation is from 1.0 to 2.0 mm/m.

## Decarburization and Surface Defects

Total decarburization is not accepted at any level and must be completely absent. For partial decarburization depth and surface defects, a maximum of 1% of the bar diameter is specified.

*Stricter conditions available upon request.

# Structure

Ferrite plus pearlite. Grain size 6 or finer, homogeneous.

# Certification

Quality Certificate including chemical analysis, nominal dimensions, hardness, microinclusions, decarburization, microstructure, and grain size.

# Bar Length

Coil spring manufacturers typically use specific unit lengths. Depending on the application, multiple lengths may be specified in some cases. Tolerance for unit length: -0.0 mm to +5.0 mm.

# Packaging

They are packaged in bundles of bars, strapped with metal bands over polypropylene plastic strips, in round or hexagonal shapes, depending on the diameter and length, with weights ranging from 1.0 t to 2.0 t.

| ArcelorMittal | Similar AISI/SAE/DIN | Chemical Composition (%) | | | | | | | Characteristics |
|---|---|---|---|---|---|---|---|---|---|
| | | C | Mn | P | S | Si | Cr | Al | |
| HK60 | 5160 | 0.56 - 0.64 | 0.75 - 1.00 | ≤ 0 .030 | ≤ 0 .015 | 0.15 - 0.35 | 0.70 - 0.90 | 0.015 - 0.040 | Good hardenability and high tensile and fatigue strength. Ideal for hot forming processes. |
| HK54 | 9254 | 0.51 - 0.59 | 0.60 - 0.80 | ≤ 0.015 | ≤ 0.015 | 1.20 - 1.60 | 0.60 - 0.80 | 0.015 - 0.040 | |
| 9254S | 9254 | 0.51 - 0.59 | 0.60 - 0.80 | ≤ 0 .015 | ≤0 .015 | 1.30 - 1.55 | 0.60 - 0.80 | - | Good hardenability and high tensile and fatigue strength. Ideal for cold forming processes. |
| 38Mn6 | 38Mn6 | 0.34 - 0.40 | 1.40 - 1.65 | ≤ 0.020 | ≤ 0 .010 | 0.15 - 0.35 | 0 .100 | 0.015 - 0.040 | Good hardenability and high tensile and fatigue strength. |

# Drawn Round Bars for Shock Absorber Rods

Specifications CK25, CK35, CK40 e 1045+

## Sizes and Tolerances

Available in diameters from 8.00 mm to 22.40 mm with h11 tolerance.

## Bar Length

Bars for shock absorber rods typically have specific length and cutting tolerance requirements for each application, aiming to maximize blank yield. Length tolerance: -0/+50 mm.

## Straightness

The maximum specified straightness deviation is 1 mm per meter.

# Packaging

They are packaged in hexagonal bundles, strapped with steel bands over polypropylene plastic strips, with weights ranging from 1.0 t to 2.0 t.

# Structure

Ferrite plus lamellar pearlite with homogeneous distribution. Minimum ferritic grain size 6, homogeneous.

# Certification

Chemical analysis and mechanical test results as specified by the customers.

| ArcelorMittal | Similar AISI/SAE/DIN | Chemical Composition | | | | | | Characteristics |
|---|---|---|---|---|---|---|---|---|
| | | C | Mn | P | S | Si | Al | |
| CK25 | CK25 | 0.22 - 0.28 | 0.40 - 0.60 | ≤ 0.030 | ≤ 0.030 | 0.15 - 0.30 | 0.020 - 0.080 | Good machinability, hardenability, weldability, and mechanical strength. |
| CK35 | CK35 | 0.35 - 0.39 | 0.60 - 0.75 | ≤ 0.025 | ≤ 0.030 | 0.15 - 0.35 | 0.020 - 0.070 | |
| CK40 | CK40 | 0.43 - 0.47 | 0.60 - 0.80 | ≤ 0.030 | ≤ 0.030 | 0.15 - 0.35 | %Al + %Nb: 0.020 - 0.050 | |
| 1045+ | 1045 | 0.43 - 0.47 | 0.60 - 0.80 | ≤ 0.030 | 0.015 - 0.040 | 0.15 - 0.30 | %Al + %Nb: 0.020 - 0.050 | |

# Drawn Bars for Free Cutting

Specifications DIN 11SMn37, DIN 11SMn30 e SAE 12L14

## Available Sizes and Tolerances at:

- Round bars from 4.76 mm to 41.28 mm with standard h11 tolerance, according to ISO standard.
For certain sizes and steel grades, h9 tolerances may be accepted upon request.
- Hexagonal bars from 5.00 mm to 38.10 mm, with h11 tolerance.

## Bar Lengths

Standard length of 3 m. Length tolerance:

-0/+100 mm, or upon request.

# Packaging

They are packaged in round bundles, strapped with steel bands over plastic strips, with weights ranging from 1.0 t to 2.0 t, depending on the bar size.

# Certification

Quality Certificate with bar identification data and chemical analysis.

| Steel | ArcelorMittal | Chemical Composition(%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | C | Mn | P | S | Si | Others |
| 11SMn30 | 1212 E2 | 0.05 - 0.14 | 0.09 - 1.30 | 0.040 - 0.100 | 0.27 - 0.33 | máx. 0.02 | - |
| 11SMn37 | 1212 E4/BL15 | máx. 0.15 | 1.10 - 1.50 | 0.040 - 0.100 | 0.34 - 0.40 | máx. 0.02 | - |
| SAE 12L14 | 12L14 E1 | 0.06 - 0.09 | 0.85 - 1.15 | 0.040 - 0.090 | 0.26 - 0.35 | máx. 0.02 | Pb: 0.20 - 0.35 |

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