

# 4340

**Grade**

AISI 4340 (UNS G43400, ASTM A29)

**Type**

Cr-Mo Steel usually supplied in the hardened, quenched and tempered condition.

**Overview**

Low alloy steel typically containing 0.4% Carbon and alloyed with 0.8% Chromium, 1.8% Nickel and 0.25% Molybdenum to give enhanced mechanical properties and higher strength.

Often used in place of 4140/4145 due to its higher strength levels and improved impact properties at high strength.

Impact toughness is generally good to temperatures as low as -46°C with typically 27J average and 20J single achieved, this is limited though dependent on a number of factors such as ruling section, chemical composition and heat treatment condition, with impact toughness achieved decreasing with higher strength, increased ruling section and at lower test temperatures due to the materials Ductile / Brittle transition temperature.

**Composition**

| Element    | Weight%     |
|------------|-------------|
| Carbon     | 0.38 - 0.43 |
| Silicon    | 0.15 - 0.35 |
| Manganese  | 0.6 - 0.8   |
| Phosphorus | 0.025 max   |
| Sulphur    | 0.025 max   |
| Molybdenum | 0.2 - 0.3   |
| Chromium   | 0.7 - 0.9   |
| Nickel     | 1.65 - 2    |
| Manganese  | 0.6 - 0.8   |

Notes: Various other hybrid analysis available in order to enhance hardenability and mechanical properties.

S and P values conform with API 6A, PSL 3 requirements. Higher values may be permitted if delivered to alternative specifications

**Application**

The grade has limited through hardenability which must be taken into account when designing and selecting it for specific equipment.

Shock loading or stress concentration applications are suitable for this grade. It is widely used in the oil and gas industry for applications such as oil tools, crossovers, drill jars, drill shoes, tool holders, and reamers.

Applications within the aerospace industry include bolting and air frames.

**Mechanical Properties**

Hardened followed by oil quenching and tempering

Typical tempering range is 620 – 680°C, depending on properties required



PRODUCT DATASHEET

# 4340

| Property                  | Values                        |
|---------------------------|-------------------------------|
| 0.2% Yield Strength       | 130 KSI min<br>(896 MPA min)  |
| Ultimate Tensile Strength | 150 KSI min<br>(1034 MPA min) |
| Elongation                | 15                            |
| Reduction of area         | 35% min                       |
| Hardness                  | 302 - 328 HBN                 |

Notes: Hardness condition is outside of NACE.