

AISI 4340

Grade: AISI 4340 (UNS G43400, ASTM A29)

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

Nominal Composition	
Element	Weight %
Carbon	0.38 – 0.43
Silicon	0.15 – 0.35
Manganese	0.60 – 0.80
Phosphorus	0.025 max *
Sulphur	0.025 max *
Molybdenum	0.20 – 0.30
Chromium	0.7 – 0.90
Nickel	1.65 – 2.0

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

Mechanical Properties Condition:

Hardened followed by oil quenching and tempering

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

Property	Values
Ultimate Tensile Strength	150 min Ksi (1034 Mpa)
0.2 % Yield Strength	130 min Ksi (896 Mpa)
Elongation	15 % min
Reduction of Area	35 % min
Hardness	302– 328 BHN

****Notes:** Hardness condition is outside of NACE.

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 Deg 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.

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.