

# 4340 Alloy Steel

An iron-based alloy steel, 4340 contains nickel, chromium and molybdenum

4340 Alloy Steel can be heat treated to achieve high strength whilst maintaining good toughness, wear resistance and fatigue strength levels, combined with strength up to 315 °C.

## PRODUCT FORMS

PRODUCT FORM	SIZE RANGE FROM	SIZE RANGE TO
4340 Round bar	30 mm	160 mm

Can't find the size you need? Please contact us at [onlinesales@neonickel.com](mailto:onlinesales@neonickel.com)

## CHEMICAL ANALYSIS

%	FE	NI	CR	MN	C	MO	SI	S	P
Min	95.195	1.65	0.70	0.60	0.37	0.20	0.15	-	-
Max	96.33	2	0.90	0.80	0.43	0.30	0.30	0.04	0.035

## APPLICATIONS

- Commercial and military aircraft
- Automotive systems
- Forged hydraulic systems

## ABOUT 4340 ALLOY STEEL

4340 Alloy Steel is an iron-based alloy containing nickel, chromium and molybdenum. The relatively high carbon content provides this alloy with superior strength in applications where severe service conditions exist. 4340 Alloy Steel has high strength, superior toughness and good ductility. In addition, the alloy is immune to embrittlement. To learn more about 4340 Alloy Steel [contact us](#) today, or fill in our online quote form and we'll get right back to you!

## PROPERTIES

<b>Density:</b>	7.85 g/cm <sup>3</sup>
<b>Melting Range:</b>	1340-1380°C
<b>Specific Heat Capacity:</b>	448 J/kg*K
<b>Electrical Resistivity:</b>	1.09 μΩ.m
<b>Coefficient of Thermal Expansion from -18-93°C :</b>	11.3 μm/mm/°C
<b>Coefficient of Thermal Expansion from -18-649°C :</b>	14.6 μm/mm/°C

**MECHANICAL & PHYSICAL PROPERTIES**

MECHANICAL & PHYSICAL PROPERTIES	21.1°C	100°C	204.4°C	315.6°C	400°C	537.8°C	648.9°C	700°C	760°C	815°C	870°C	982°C
Ultimate Tensile Strength /MPa	792	-	-	-	-	726	473	-	286	-	139	66
0.2% Yield Strength /MPa	407	-	-	-	-	363	275	-	152	-	68	31
Reduction of area %	-	-	-	-	-	-	-	-	-	-	-	-
Elongation %	31	-	-	-	-	27	32	-	75	-	90	91
1,000 hr Rupture Strength	-	-	-	-	-	-	83	47	26	15	8.3	-
Coefficient of Thermal Expansion / $\mu\text{m}/\text{m}^{\circ}\text{C}$ **	-	11	12.7	13.4	13.9	14.3	15	15.4	-	16.5	17.1	18.2
Thermal Conductivity / $\text{kcal}/(\text{hr.m.}^{\circ}\text{C})$ **	10.06	-	-	-	-	-	-	-	-	-	-	-
Modulus of Elasticity / GPa	221	216	210	203	197	190	181	173	-	165	153	140

**ROOM TEMPERATURE MECHANICAL & PHYSICAL PROPERTIES AT VARIOUS TEMPERING TEMPERATURE (NORMALISED AT 899-927 °C/AUSTENITISED AT 816-829°C/OIL QUENCHED)**

ROOM TEMPERATURE MECHANICAL & PHYSICAL PROPERTIES AT VARIOUS TEMPERING TEMPERATURE (NORMALISED AT 899-927 °C/AUSTENITISED AT 816-829°C/OIL QUENCHED)	204°C	260°C	316°C	427°C	538°C	593°C	649°C
Ultimate Tensile Strength /MPa	1905	1830					1140
0.2% Yield Strength /MPa	1530	1530					1035
Reduction of area %	35	25					60
Elongation %	11	8					18
Room Temperature Hardness/ Rockwell C at Various Tempering Temperature (Austenitised at 843°C/Oil Quenched/Tempered Twice for 2+2 Hours)	52		47	41	35		25

**HARDNESS/ ROCKWELL C AT VARIOUS TESTING TEMPERATURE**

HARDNESS/ ROCKWELL C AT VARIOUS TESTING TEMPERATURE	21 °C	93°C	204°C	316°C	427°C	538°C
Condition A: Normalised at 899 °C for 1 hour + air cool/ Austenitised at 816 °C for 0.5 hour + oil quench/ Tempered at 246 °C for 2+2 hours +air cool	49	48.5	48	45.5	35	18
Condition B: Normalised at 899 °C for 1 hour + air cool/ Austenitised at 816 °C for 0.5 hour + oil quench/ Tempered at 482 °C for 2+2 hours +air cool	40.5	38	36.5	34	31.5	18
Condition C: Normalised at 899 °C for 1 hour + air cool/ Austenitised at 802 °C for 0.5 hour + oil quench/ Tempered at 593 °C for 2 hours +air cool	34	32.5	30	27.5	24	13

**SPECIFICATIONS**

**Standards:** AMS 6409, 6415, 2304