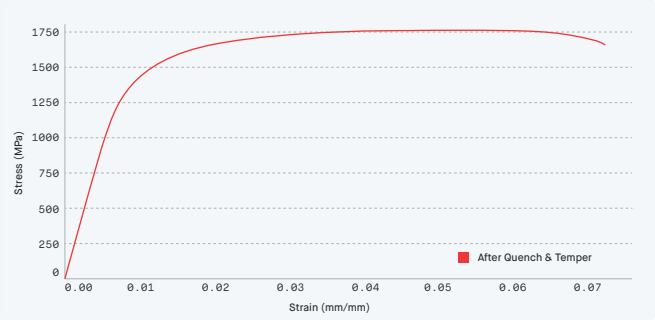
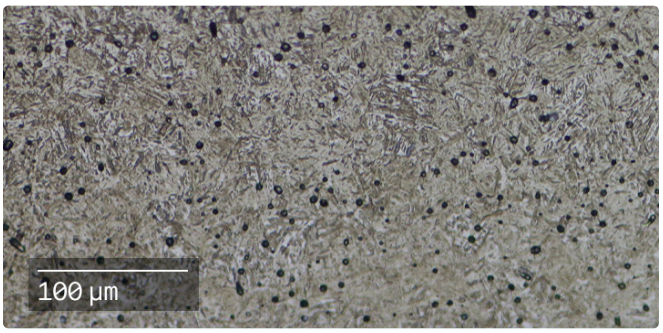
[Material Data Sheet]

4140
Chromoly Steel



COMPOSITION %

Fe	Balance
C	0.3 – 0.5
Cr	0.8 – 1.2
Mn	1.0 (max)
Mo	0.2 – 0.3
Si	0.6 (max)



MECHANICAL PROPERTIES

	Standard	Studio System 2 ™ After Quench & Temper [2]	ASTM B883 / MPIF 35 (min - typ) Standard Quenched & Tempered
Yield strength – xy (MPa)	ASTM E8M	1295	1,070 – 1,240
Ultimate tensile strength – xy (MPa)	ASTM E8M	1730	1,380 – 1,650
Elongation at break (%)	ASTM E8M	5.9	3 – 5
Young's modulus (GPa)	ASTM E111	190	205
Hardness (HRC)	ASTM E18	45	46
Density (g/cc)	ASTM B311	7.54	7.5

ATTRIBUTES & APPLICATIONS

- Low-Alloy heat-treatable steel used in applications requiring high strength, hardness, & toughness
- Good elongation with quality impact & abrasion resistance
- Automotive parts, armament components, jigs, fixtures, tooling, gears, sprockets, wrenches & structural housings
- Mechanical components (static & dynamically loaded)
- Impact components (e.g. golf iron heads, hammers, crash cans)

OTHER STANDARD DESIGNATIONS [1]

- AISI 4140
- UNS G41400
- DIN 1.7200
- JIS G4105

1. Listed designations are for reference purposes only. Composition and mechanical properties may vary.
2. Heat treated samples were soaked at 857 C for 25-30 minutes in air, quenched in a bath of Aqua Quench 245 (a water based quenchant), and then tempered at 204 C for 2 hours.

End-use material performance is impacted (+/-) by certain factors including but not limited to part geometry and design, application and evaluation conditions, etc.
Tensile properties, hardness, and density data reported are mean values minus 1 sigma.