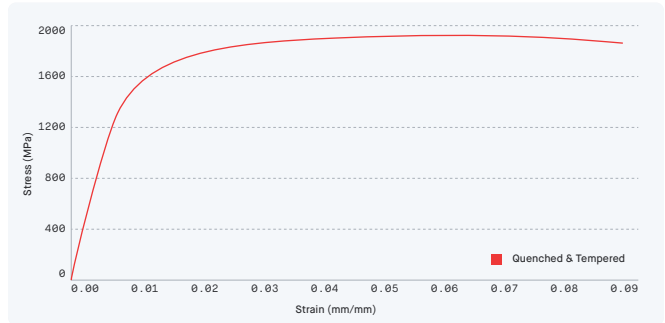


[Material Data Sheet]

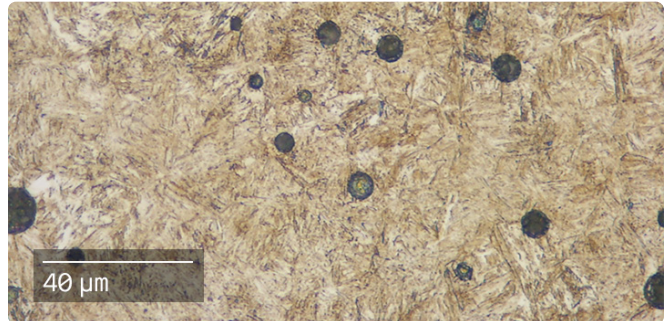
4140

Low-Alloy Steel



COMPOSITION % (AISI/SAE 4140)

| | |
|----|-----------|
| 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 | Production System™ Quenched & Tempered | ASTM B883 / MIPF 35 (min - typ) Quenched & Tempered |
|--|-------------------|---|--|
| Yield strength ¹ (MPa) | ASTM E8M | 1,455 ± 34 | 1,070 – 1,240 |
| Ultimate tensile strength ¹ (MPa) | ASTM E8M | 1,880 ± 29 | 1,380 – 1,650 |
| Elongation at break (%) | ASTM E8M | 4.8 ± 1.1 | 3 – 5 |
| Young's modulus (GPa) | ASTM E1111 | 203 ± 9 | 205 |
| Hardness (HRC) | ASTM E18 | 47.1 ± 0.7 | 46 |
| Density | g/cm ³ | 7.5 | 7.5 |
| Surface roughness ² (μm Ra) | ASTM B311 | 3 – 8 | - |

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

UNS G41400

EN 1.7225

42CrMo4

1. YS & UTS properties noted represent mean values across Xy orientation.
 2. Surface roughness measured in Z direction after sintering & sand blasting.
 3. Stress strain curve reported in X print orientations after quenching and tempering.