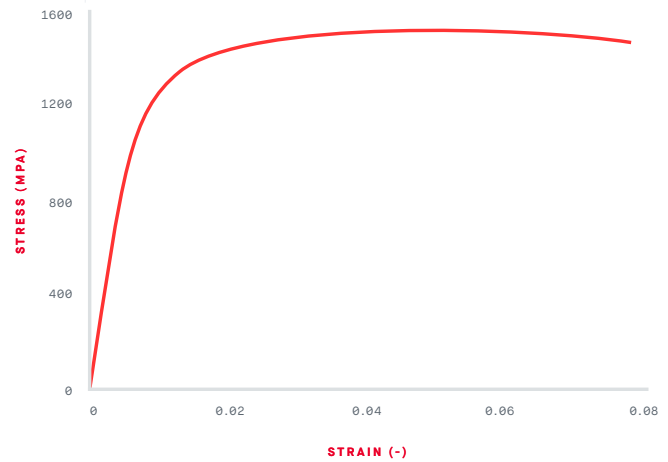


# 4140 chromoly steel

One of the most versatile steels, 4140 is characterized by its toughness, abrasion resistance, and impact resistance, making it a great all-purpose steel for industrial applications.

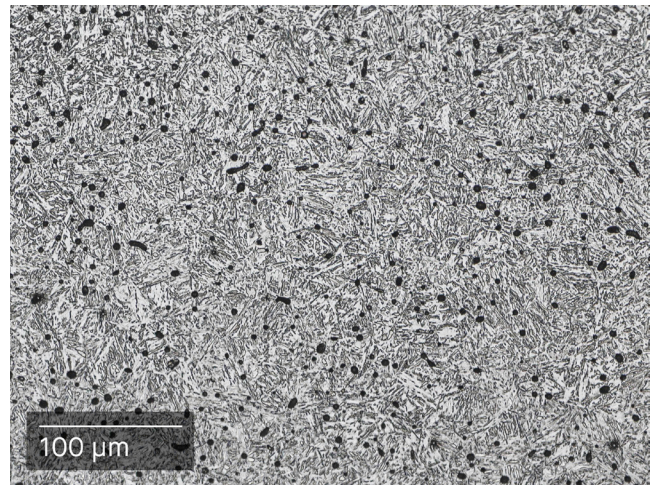


## Composition %

Cr	0.8 – 1.2
Mo	0.2 – 0.3
C	0.28 – 0.4 (0.3 typical)
Si	0.6 (max)
Mn	1.0 (max)
Fe	Balance

## Other standard designations<sup>1</sup>

AISI	4140
UNS	G41400
DIN	1.7200
JIS	G4105



Studio System™ heat treated microstructure.

## Mechanical properties<sup>2</sup>

	standard	Studio System heat treated <sup>3</sup>	MPIF 35-MIM heat treated (min) <sup>4</sup>	Wrought heat treated, for reference <sup>3</sup>
Yield strength (MPa)	ASTM E8	<b>1060</b>	1070	1500
Ultimate Tensile Strength (MPa)	ASTM E8	<b>1450</b>	1380	1990
Elongation at break	ASTM E8	<b>5.5%</b>	3%	10%
Hardness (HRC)	ASTM E18	<b>40</b>	46 (typical)	52
Density (relative)		<b>95%</b>	95.5%	100%

<sup>1</sup> Listed designations are for reference purposes only. Composition and mechanical properties may vary.

<sup>2</sup> Properties shown reflect beta processing parameters. Properties were obtained for sintering loads between 1.5 kg and 3 kg.

<sup>3</sup> Heat treated samples were oil quenched from 857 °C and tempered at 204 °C for 2 hours.

<sup>4</sup> Per MPIF Standard 35, Materials Standards for Metal Injection Molded Parts (MPIF 35-MIM, 2018).

End-use material performance is impacted (+/-) by certain factors including but not limited to part geometry and design, application and evaluation conditions, etc.