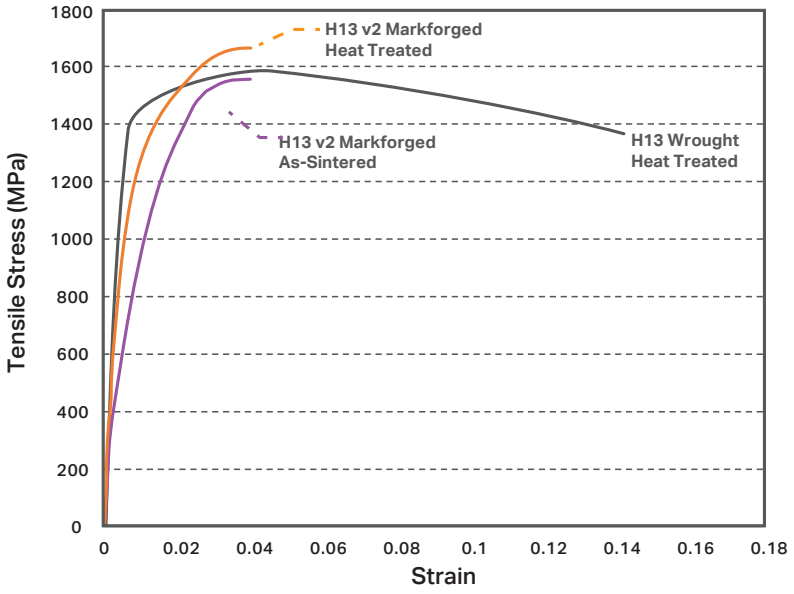
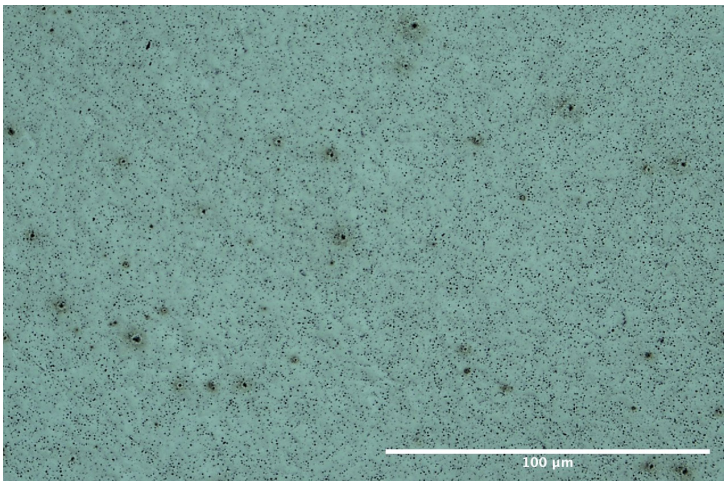
MATERIAL DATASHEET

H13 Tool Steel v2

Markforged

Composition	Amount
Chromium	4.7-5.5%
Molybdenum	1.3-1.7%
Silicon	0.8-1.2%
Vanadium	0.8-1.2%
Carbon	0.3-0.45%
Manganese	0.2-0.5%
Phosphorous	0.03% max
Sulfur	0.03% max
Iron	bal





Markforged H13 v2 As-Sintered

H13 Tool Steel v2 printed on the Metal X, washed in the Wash-1, and sintered in the Sinter-1. As-Sintered microstructure is pictured at left.

Markforged H13 v2 Heat Treated

H13 Tool Steel v2 printed with the Metal X system, air quenched at 1010°C, and double tempered at 600°C

Wrought H13 Heat Treated

Wrought H13 tool steel standard from *ASM Specialty Handbook* - air quenched at 1010°C and double tempered at 600°C.

Typical Mechanical Properties	Standard	Markforged As-Sintered	Markforged Heat Treated	Wrought Heat Treated*
Ultimate Tensile Strength	ASTM E8	1540 MPa	1680 MPa	1580 MPa
0.2% Yield Strength	ASTM E8	860 MPa	1250 MPa	1360 MPa
Elongation at Break	ASTM E8	4%	4.7%	14%
Hardness	ASTM E18	40 HRC	45 HRC	46 HRC
Relative Density	ASTM B923	94.5%	94.5%	100%

These data represent typical values for Markforged H13 Tool Steel v2 as-sintered and after heat treatment. Values were tested in house, and both material composition and "As-Sintered" data were confirmed by outside testing. These representative data were tested, measured, or calculated using standard methods and are subject to change without notice. Markforged makes no warranties of any kind, express or implied.
*Wrought Heat Treated data included in table only. Data from *ASM Specialty Handbook: Tool Materials* page 140