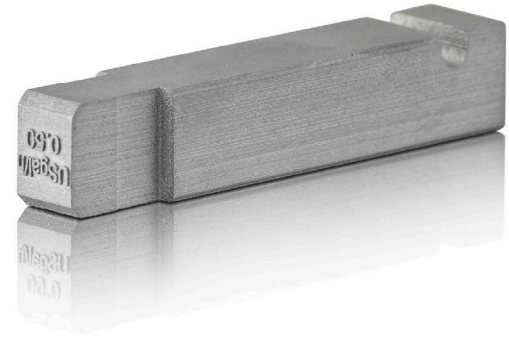


D2

TOOL STEEL

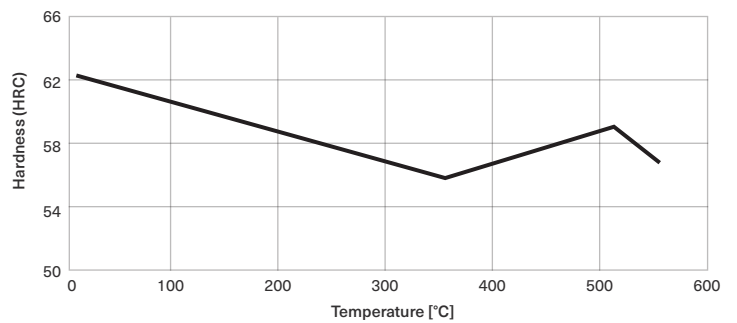
D2 is an air-hardening tool steel that offers outstanding hardness and abrasion resistance while still maintaining moderate toughness.

It's primarily used for cutting and forming tools, such as shear cutters, punches, dies, and stamping tools. This material remains stable throughout heat treatments, making it possible to fine-tune the final properties after sintering.



Composition	Weight%	Features & Benefits High abrasion resistance & toughness Extremely hardenable Excellent for cutting & forming metal
Iron	Balance	
Carbon	1.5	
Silicon	0.3	
Manganese	0.5	
Vanadium	0.9	
Molybdenum	1	
Chromium	12	

HARDNESS CURVE FOR TEMPERING OF D2 TOOL STEEL

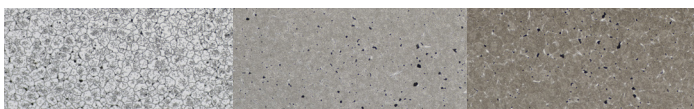


*Related standards: UNS T30402, ASTM A681, 1.2379 and SKD11

Density	Hardness (HRC)
Relative	98%
As Sintered	35
Hardened	62
Hardened + Tempered	58

*Hardening consists of a solution treatment with subsequent air quenching. Single tempering provides the results displayed.

Metallographic Structure



As Sintered Hardened Hardened + Tempered



Specimens with subsequent process steps, bottom to top: as sintered, after hardening, after tempering and after blasting.

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, including, but not limited to, the warranties of merchantability, fitness for a particular use, or warranty against patent infringement; and assumes no liability in connection with the use of this information. The data listed here should not be used to establish design, quality control, or specification limits, and are not intended to substitute for your own testing to determine suitability for your particular application. Nothing in this sheet is to be construed as a license to operate under or a recommendation to infringe upon any intellectual property right.