

Material Information



Tool Steel A2

Introduction

Tool Steel A2, also known as AISI A2, UNS T30102, or DIN 1.2363, is an air-hardening cold-work tool steel containing chromium, molybdenum, and vanadium. It offers a balanced combination of high hardenability, wear resistance, toughness, compressive strength, and dimensional stability after heat treatment, making it suitable for precision CNC-machined tooling and wear-resistant components.

Advantages

Good machinability, high compressive strength, good wear resistance, excellent hardenability, and good dimensional stability after hardening. Tool Steel A2 also provides a useful balance of wear resistance and toughness, helping reduce the risk of chipping in cutting and forming applications.

Disadvantages

Tool Steel A2 is more difficult to machine than common carbon and low-alloy steels, particularly after hardening. It is also primarily intended for cold-work tooling rather than general-purpose structural applications, and its performance depends strongly on the selected heat-treatment condition.

Tolerance

3DSPRO can manufacture and inspect to tight tolerances, including sub +/- 0.001" tolerances, per your drawing specifications and GD&T callouts.

Recommendation

The combination of wear resistance, toughness, compressive strength, hardenability, and dimensional stability makes Tool Steel A2 suitable for CNC-machined dies, punches, tooling components, gauges, and other precision parts subjected to repeated mechanical loading and wear. It is particularly appropriate for cold-work applications where a balance between toughness and wear resistance is required.

Material Specifications (For reference only.)	
Tensile strength	1275 to 1585MPa
Shear modulus	78GPa
Elongation at Break	1% to 5%

Hardness	57 to 62 HRC
Density	7.86 g/cm ³

Attention

Tool Steel A2 is normally machined in its annealed condition before hardening and tempering. Because heat treatment can affect dimensions, machining allowances and the final finishing process should be considered when producing precision components. After hardening, A2 can reach high hardness levels, making subsequent machining and grinding considerably more demanding.

Applications

3DSPRO finds people using Tool Steel A2 to make functional parts and precision tooling in the following industries and applications.

Cold forming and stamping:

Blanking dies, bending dies, forming tools, punches, and other cold-work tooling.

Industrial tooling:

Forming rolls, drill bushings, master dies, gauges, guide components, and other wear-resistant tooling parts.

Cutting and forming equipment:

Knurling tools, cutting dies, inserts, punches, and other components requiring high compressive strength and resistance to chipping.

General engineering:

Precision fixtures, wear-resistant machine components, tooling plates, and other CNC-machined parts requiring dimensional stability and good wear resistance.