Xometry

Data Sheet

Tool steel 1.2709 / MS1

Alternative Designations

1.2709 (DIN/BS) | X3NiCoMoTi18-9-5 (ISO)

Key Features

Ultra high strength • Good machinability • Wear resistant

Description

Tool steel 1.2709 / MS1 is made by adding carbon and other elements to iron. The amount of carbon in the steel determines how hard and tough it is. The more carbon, the harder and tougher the steel is. This is a high wear-resistant material with ultra-high strength and is easily machinable. It has enhanced ductility with a yield strength of about 2180 MPa. It is widely used in tooling, plastic injection molding, and die casting tools.

Mechanical Properties

Yield strength	2180 MPa
Tensile strength	2260 MPa
Elongation at break	4.2%
Hardness	550
Module of elasticity	180 GPa

Physical Properties

Density	8.05 g/cm³
Electrical conductivity	10.1 m/Ω · mm²
Coefficient of thermal expansion	10.72 K-1 · 10-6
Thermal conductivity	15.8 W/m · K
Specific heat capacity	430 J/kg · K

Chemical Composition

Al	0.05 – 0.15%	N	-
Bi	-	Nb	-
C	0.03%	Ni	17 – 19%
Cd	-	O	-
Co	8.5 – 10%	P	-
Cr	0.5%	Pb	-
Cu	-	S	-
Fe	Rest is Fe	Si	-
H	-	Sn	-
Mg	-	Ti	0.80 – 1.2%
Mn	0.1%	V	-
Mo	4.5 – 5.2%	Zn	-

Reference

Datasheets provided by Xometry contain materials sourced through trusted OEMs, material distributors, and databases. Please visit Materialdatacenter.com for further information on this material.