

# Cincinnati Tool Steel Company

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## Drill Rod

### O1 Oil Hardening

#### Typical Analysis

Carbon	0.90	Vanadium	0.20
Manganese	1.20	Chromium	0.50
Silicon	0.30		

The most widely used grade of drill rod. It is a general purpose tool steel, outstanding for its reliability in hardening, good wear resistance, and excellent toughness.

### W1 Water Hardening

#### Typical Analysis

Carbon	0.95 to 1.10
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Water hardening grade is intended to meet the needs of the machine shop for average work where better grades of tool steel drill rod are not required.

### A2 Air Hardening

#### Typical Analysis

Carbon	1.00	Vanadium	0.25
Molybdenum	1.10	Chromium	5.25
Manganese	0.60		

A2 is recommended rather than O1 when increased wear resistance, safer hardening, and less distortion are required.

## S7 Air Hardening Super Shock

### Typical Analysis

Carbon	0.50	Molybdenum	1.40
Silicon	0.25	Chromium	3.25
Manganese	0.70		

A new outstanding air-hardening drill rod - the toughest, strongest drill rod for so many jobs that require maximum strength and impact.

## D2 High Carbon - High Chrome

### Typical Analysis

Carbon	1.50	Molybdenum	0.75
Chromium	12.00	Vanadium	0.25 to 0.80

An air-hardening type steel known for its maximum wear resistance qualities. It is ideal for use in tools, dies, etc., used in long production runs.

## M2 Moly-Tungsten-High Speed

### Typical Analysis

Carbon	0.83	Chromium	4.15
Molybdenum	5.00	Vanadium	1.90
Manganese	6.35		

The most widely used type of high-speed steel and, in general, can be used for the same applications as T-1 high speed. Its higher carbon content and balanced analysis produce properties applicable to all general-purpose high-speed uses.

## Fine Standard Tolerances – Next Page

## Fine Standard Tolerances

	DIMENSIONAL TOLERANCES		
	Standard		Standard
	Tolerance*	Straightness	Tolerance*
	(section)	Max T.I.R.	(length)
Round Drill Rod			
3.000" to 0.500"	+/- .0010"	.005"	+1/8", -.0
0.499" thru 0.125" dia.	+/- .0005"	.005"	+1/8", -.0
0.124" and smaller	+/- .0003"	.005"	+1/8", -.0
Flat and Square Drill Rod			
1.000" thru 0.750" (largest dim.)	+/- .0015"		+1/8", -.0
0.749" to 0.250" (largest dim.)	+/- .0010"		+1/8", -.0
0.249" and smaller	+/- .0005"		+1/8", -.0
* Closer tolerances than standard can be produced upon special request.			

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Data shown are typical, and should not be construed as maximum or minimum values for specification or for final design.  
Data on any particular piece of material may vary from those herein.