

TOOL STEEL SPECIFICATIONS

GUIDE TO SELECTION

O1 General purpose nondeforming, oil hardening tool steel for applications where maximum dimensional accuracy is required during hardening.

A2 Air hardening tool steel with superior abrasion resistance for long service. Inherent toughness make it particularly adaptable for use in dies and punches. Excellent nondeforming characteristics.

D2 High carbon, high chromium tool steel with outstanding wear resistance. Applications include lamination dies - also widely used for reamer blades, knurls, brass turning tools, cutters, brick molds, punches and spinning, forming and seaming tools.

S7 Air hardening shock steel with excellent toughness, combined with good resistance to softening at temperatures up to 1,000° F. Suitable for both hot and cold work tooling applications that involve shock.

H13 An excellent hot work steel with an outstanding combination of shock resistance, red hardness, and abrasion resisting properties. Especially suitable as a die steel for aluminum and magnesium die casting.

420ESR High chromium stainless steel grade - an air or oil hardening mold steel having superior internal cleanliness combined with good corrosion resistance. Supplied in the Annealed Condition

P20 is a prehardened, general purpose mold steel suitable for production of machined or EDM'd plastic mold and zinc die casting die components.

Marshallloy MQ Mold quality steel supplied in the prehardened condition. A uniform product with exceptional cleanliness able to be polished to an extremely high finish required for plastic molding. The balanced alloy composition ensures a uniform cross-sectional hardness similar to P20.

4140HT Direct hardening alloy steel that can be quenched and tempered to obtain a wide range of hardness, ductility and strength levels.

DECARB FREE Mill finished, free from "mill scale," and ready to use.

TOOL STEEL ROUNDS



10/12 Ft. Random Length (Decarb Free)

Size in Inches (Diam.)	Lbs./Ft.	AISI TYPE						
		O1	A2	D2	S7	P20	H13	420ESR
1/2	.67	X	X	X	X		X	
5/8	1.04	X	X	X	X			
3/4	1.50	X	X	X	X		X	
7/8	2.04	X			X			
1	2.67	X	X	X	X	X	X	X
1 1/8	3.38	X	X	X	X			
1 1/4	4.17	X	X	X	X	X		X
1 3/8	5.05	X	X	X	X			
1 1/2	6.01	X	X	X	X	X	X	X
1 5/8	7.05	X	X		X		X	
1 3/4	8.18	X	X	X	X	X	X	X
2	10.68	X	X	X	X	X	X	X
2 1/8	12.06		X		X			
2 1/4	13.52	X	X		X	X	X	X
2 1/2	16.69	X	X	X	X	X	X	X
2 3/4	20.20		X	X	X		X	
3	24.03	X	X	X	X	X	X	X
3 1/4	28.21				X		X	
3 1/2	32.71	X	X	X	X		X	X
4	42.27	X	X	X	X	X	X	X
4 1/2	54.08	X			X		X	X
5	66.76	X	X	X	X	X	X	X
5 1/2	80.78				X			
6	96.13	X	X	X	X	X	X	X
6 1/2	112.82		X				X	
7	130.80						X	X
8	170.79			X			X	X
8 1/2	192.96						X	
9	216.30							X

CUT TO: ANY LENGTH UP TO MAX.

TOLERANCE: DIAMETER +.010" TO +.150"

Typical Chemistry	Marshallloy	P-20	4140HT
Carbon	.36 / .42	.37	.36 / .44
Manganese	1.10 / 1.30	1.40	.70 / 1.00
Silicon	.35 / .45	.30	.15 / .30
Chromium	1.00 / 1.20	2.00	.80 / 1.15
Molybdenum	.15 / .35	.20	.15 / .25
Nickel	.25 / .50	1.00	
Sulphur	.002 Max.	.008	.040 Max.
Phosphorous	.010 Max.		.035 Max.

TOOL STEEL PLATES

(Decarb Free)



Size in Inches	Lbs./Sq.Ft.	AISI TYPE											
		O1	O6	A2	A6	D2	S7	P20	H13	4140HT*	420ESR	MARSH- ALLOY MQ-FM	
1/4	11.20												X
3/8	16.70	X		X*				Δ		Δ			X
1/2	21.89	X		X			X	Δ		Δ	X		X
5/8	26.93	X		X			X	Δ		Δ	X		X
3/4	32.11	X	X	X		X	X	Δ		Δ	X		X
7/8	37.15	X						Δ		Δ			X
1	42.19	X		X	X*	X	X	Δ	X	Δ	X		X
1 1/8	47.38												X
1 1/4	52.42	X*		X	X	X	X	Δ	X	Δ	X		X
1 3/8	57.60							Δ		Δ	X		X
1 1/2	62.64	X		X	X	X	X	Δ	X	Δ	X		X
1 3/4	72.86			X	X	X	X	Δ		Δ	X		X
2	83.09	X		X	X		X	Δ	X	Δ	X		X
2 1/4	93.31							Δ		Δ			X
2 1/2	103.39			X	X		X	Δ	X	Δ	X		X
3	123.82			X		X	X	Δ	X	Δ	X		X
3 1/2	144.29							Δ		Δ	X		X
4	167.04		X				X	Δ		Δ			X
4 1/2	188.64							Δ		Δ			X
5	208.80							Δ		Δ			X
6	249.12							Δ		Δ			X
7	289.44												X

STOCKED IN: 32" x 72" PLATE

CUT TO: ANY LENGTH OR WIDTH AVAILABLE

TOLERANCE: THICKNESS +.015" TO +.035"

WIDTH +.062" TO +.125"

LENGTH +.125" TO +.250"

* Stocked in widths 15" to 16" X 72" long

Δ We stock Marshalloy MQ-FM as an equivalent to items marked with a triangle (Δ).

✦ 4140HT Manufactured to Alloy Steel Tolerance.

NOTE: Call salesperson regarding availability of random drops.

DRILL ROD

36" Lengths

Size in Inches	AISI TYPE			
	W-1	O-1	A-2	S-7
.062	X			
.125	X	X	X	
.140	X			
.156	X	X		
.172	X			
.187	X	X	X	
.250	X	X	X	X
.281		X		
.312	X	X	X	X
.375	X	X	X	
.438	X	X	X	
.500	X	X	X	
.563	X			
.625	X	X	X	
.687		X		
.750	X	X	X	
.875		X	X	
.937	X	X		
1.000	X	X	X	
1.062	X	X		
1.125	X	X		
1.250	X	X	X	
1.375		X	X	
1.500		X		
1.750		X		

Tool Steel Type	Prefix	Specific Types
Cold Work	W = Water Hardening O = Oil Hardening A = Medium Alloy Air Hardening D = High Carbon, High Chromium	W1, W2, W5 O1, O2, O6, O7 A2, A4, A6, A7, A8, A9, A10, A11 D2, D3, D4, D5, D7
Shock Resisting	S	S1, S2, S4, S5, S6, S7
Hot Work	H	H10 - H19 Chromium Types H20 - H39 Tungsten Types H40 - H59 Molybdenum Types
High Speed	M T	Molybdenum Types (M1, M2, M3-1, M3-2, M4, M6, M7, M10, M33, M34, M36, M41, M42, M46, M50 Tungsten Types (T1, T4, T5, T6, T8, T15)
Mold Steels	P	P6, P20, P21
Special Purpose	L and F Series	L2, L6

4140/4142 H.T. ALLOY ROUNDS

Size in Inches (Diam.)	Lbs./Ft.	AISITYPE	
		HR 18-24'	CF 10-13'
1/2	.67		X
5/8	1.04		X
3/4	1.50	X	X
7/8	2.05	X	X
1	2.67	X	X
1 1/8	3.38	X	
1 1/4	4.18	X	X
1 5/16	4.60		X
1 3/8	5.05	X	X
1 7/16	5.52		X
1 1/2	6.01	X	X
1 5/8	7.06	X	
1 3/4	8.19	X	X
2	10.69	X	X
2 1/4	13.53	X	X
2 3/8	15.08		X
2 1/2	16.71	X*	X
2 3/4	20.21	X	X
3	24.06	X	X*
3 1/4	28.23	X	X
3 3/8	30.42		X
3 1/2	32.74	X	X
4	42.77	X	X
4 1/2	54.13	X	X
5	66.82	X	X
5 1/4	73.60	X	
5 1/2	80.86	X	
6	96.22	X	
6 1/2	112.93	X	
6 1/4	104.31	X	
6 3/4	121.67	X	
7	130.97	X	
7 1/2	150.35	X	
8 1/2	193.12	X	
10	267.29	X	

CUT TO: ANY LENGTH UP TO MAX.

*Also available in Annealed Condition

FLAT GROUND STOCK

18"/36" Lengths



Size in Inches			AISI TYPE			
			O-1	S-7	A-2	24" Low Carbon
.015	x	1.000	X			
.031	x	6.000	X			
.062	x	.750	X			
		1.000	X		X	
		2.000			X	
.094	x	.500	X			
		1.000	X			
.125	x	.500	X			
		.750	X			
		1.000	X		X	X
		1.250	X			
		1.500	X			X
		2.000	X		X	X
		2.500	X	X		
		3.000	X			X
		4.000	X			
		6.000	X			
		8.000	X			
.187	x	1.000	X	X	X	X
		1.500	X	X	X	X
		1.750	X			
		2.000	X		X	X
		3.000	X	X		X
		4.000				X
.250	x	.250	X			
		.750	X	X	X	
		1.000	X	X	X	X
		1.250	X			
		1.500	X	X	X	X
		1.750	X			
		2.000	X	X	X	X
		2.500	X	X		
		3.000			X	X
		3.500				
		4.000			X	X
		5.000				X
		6.000			X	X

Continued on next page.

FLAT GROUND STOCK

18"/36" Lengths

(Continued)

Size in Inches		AISI TYPE			
		0-1	S-7	A-2	24" Low Carbon
.312	x .312	X			
	.750	X			
	1.000	X		X	
	1.500	X			
	2.500		X		
	6.000	X			
.375	x .375	X			
	.500	X			
	.750	X			
	1.000	X		X	X
	1.250	X			X
	1.500	X	X	X	X
	2.000	X	X	X	X
	2.500	X			
	3.000	X	X		X
	3.500	X			X
	4.000	X		X	X
	6.000	X		X	X
.500	x .500	X		X	X
	.625	X			
	1.000	X		X	X
	1.500	X		X	X
	2.000	X		X	X
	2.500				X
	3.000			X	X
	4.000				X
	5.000				X
		6.000		X	X
.625	x 2.000				X
	4.000				X
.750	x .750	X			
	6.000				X
1.000	x 1.000	X			
	2.000				X