

SUPER 7

Shock Resistant Tool Steel

Precision Marshall's SUPER 7 is a premium shock resistant tool steel which provides a unique combination of machinability, exceptional toughness, ease of heat treatment and minimum distortion. Meets ASTM A-681.

Chemistry

Element	Range	Aim	Element	Range	Aim
Carbon	.48/.55	.50	Chromium	3.10/3.50	3.30
Manganese	.60/.80	.70	Molybdenum	1.30/1.55	1.35
Phosphorus	.015 max	.005	Silicon	.20/1.00	.50
Sulfur	.002 max		Vanadium	.20/.30	.25
.0005			Tungsten	.30 max	
Copper	.25 max		Nickel	.40 max	

Applications

SUPER 7 is suitable for use in applications requiring high impact strength such as shears, punches, blanking dies and chisels. **SUPER 7's superior soundness makes it suitable for high-hardness plastic molds and zinc die casting dies.**

Annealing

Heat slowly and uniformly to 1500/1550°F and hold two hours. Cool slowly (50°F per hour max.) to 1100°F and air cool to room temperature. Hardness 229 BHN maximum.

Heat Treating

Precision Marshall's SUPER 7 is subject to decarburization during heat treatment, so a protective atmosphere furnace or a vacuum furnace should be used.

After preheating 1200/1250°F, soak material for one half hour per inch of thickness. When material reaches this temperature, heat to 1725°F, then soak material for one half hour per inch of thickness when material is up to this temperature. Air cool or oil quench to hand warm (approximately 150°F) and temper immediately. Note: Sections over two inches thick should be interrupted oil quenched or full oil quenched to attain full hardness.

Tempering

Double temper one hour per inch of section thickness to desired hardness at a heating rate of two hours per inch. Cool in air to room temperature between the two tempers. Representative hardness levels after tempering are tabulated below.

Oil quenched from 1725°F • Tempered 4 Hours
(Section Size — 4" x 4")

Tempering Temperature (°F)	Rockwell Hardness (RC)	Tempering Temperature (°F)	Rockwell Hardness (RC)
400	56/58	900	51/53
500	54/56	1000	49/52
600	53/55	1100	46/48
700	52/54	1200	39/41
800	52/54		



The Deluxe Company

Note: Variations in section size, heating rate, soak time, quench rate and tempering will cause deviations from the above values. Precision Marshall should be consulted for specific applications. The tempering range from 600° to 800°F should be avoided due to a drop in impact strength. Recommended working hardness ranges are RC 56/58 or RC 50/52.

SUPER 7

EDM

Electro-discharge machining is used in the production of various tooling. This process produces recast, rehardened and retempered layers on the EDM surface. It is recommended that SUPER 7 be stress relieved at 50°F below the final tool tempering temperature, after the EDM process, to temper the rehardened layer produced by EDM.

Condition

SUPER 7 is provided completely decarb free and stress relieved.

Additional Products

Deluxe Plates

MARSHALLOY MQ®/FM
MARSHALLOY™ STD 4142
PRESCO O-1
AIRTRUE A-2
DIECRAT A-6
ARISTOCRAT D-2
FIRECHROME H-13
TRM-2 M-2
RUETOM SPECIAL 420 ESR

Ground Flat Stock

PRESCO O-1
AIRTRUE A-2
SUPER 7 S-7
NUTEC 42® 4142
ARISTOCRAT D-2
MARSHALLCRAT® LC

Drill Rod

WATERCRAT W-1
OILCRAT O-1
AIRTRUE A-2
SUPER 7 S-7
ARISTOCRAT D-2
TRM-2 M-2
WATERCRAT W-1 Cold-drawn

The Deluxe Company's Guarantee of Quality

Precision Marshall's conformance to specifications is the highest in the industry. Precision Marshall assumes complete liability for any costs directly relating to a deviation from our published specifications. Any such costs, properly documented, will be reimbursed.

Chemical Compositions (%) (Typical)

Grade	A.I.S.I.	Carbon	Maganese	Silicon	Phosphorus (max)	Sulfur (max)	Chromium	Vandium	Tungsten	Molybdenum
PRESCO	O-1	.90/1.00	1.00/1.15	.20/.35	.020	.020	.40/.60	.08/.15	.45/.60	-
AIR-TRUE	A-2	.90/1.05	.40/.60	.20/.35	.025	.005	4.90/5.30	.15/.20	-	.90/1.10
SUPER-7	S-7	.48/.53	.50/.70	.20/.40	.025	.003	3.10/3.40	.20/.30	-	1.30/1.60
NUTEC 42	4142	.38/.46	.70/1.00	.15/.30	.035	.040	.80/1.15	.030 Max	-	.15/.25
ARISTOCRAT	D-2	1.50/1.60	.20/.40	.20/.60	.030	.020	11.25/12.00	.80/1.00	-	.70/.80
MARSHALLCRAT	C-1018	.15/.25	.60/.90	-	.040	.050	-	-	-	-
PREMAR 440C	440C	1.05	.40	.40	-	-	17.00	-	-	.40
PREMAR 410	410	.13	.05	.40	-	-	12.00	-	-	-
RUETOM SPECIAL 420 SS	420	.46	.40	.40	-	-	13.00	.30	-	-
FIRECHROME	H-13	.40	.40	1.00	.030	.030	5.00	1.00	-	1.20
WATERCRAT	W-1	.95/1.05	.30/.40	.10/.25	.025	.025	.15 Max	.10 Max	.15 Max	.10 Max

*C-1018 modified for sizes below 5/32". W-1 is cold drawn, not ground.

Specifications and Physical Properties

Grade	A.I.S.I.	UNS				-----Hardness-----		Machinability
		Designation	S.A.E.	A.S.T.M.	Federal	Brinell	Rockwell	
PRESCO	O-1	T31501	J-437	A-681-07	QQT-570 Rev. C.	177-212	Rb88-95	95
AIR-TRUE	A-2	T30102	J-437	A-681-07	QQT-570 Rev. C.	200-235	Rb93-99	65
SUPER-7	S-7	T41907	J-437	A-681-07	QQT-570 Rev. C.	188-223	Rb90-97	95
NUTEC 42	4142	G41420	-	A-322	-	261-321	Rc26-34	85
ARISTOCRAT	D-2	T30402	J-437	A-681-07	QQT-570 Rev. C.	220-255	Rb97-102	50
MARSHALLCRAT	C-1018	-	-	-	635	168 Max	Rb85 Max	78
PREMAR 440C	440C	-	-	-	-	229-269	Rc21-28	45
PREMAR 410	410	-	-	-	-	217	Rb96	54
RUETOM SPECIAL 420 SS	420	-	-	-	-	255	Rc25	45
FIRECHROME	H-13	-	-	A-681-07	-	230	Rb98	75
WATERCRAT	W-1	T72301	J-437	A-686-79	QQT-580 Rev. C.	200	Rb93	100

*C-1018 modified.

*Compared to 1.0% Carbon Tool Steel.

Tolerances

Thickness.....+/- .001"
 Thickness (Oversize).....+ .010/.015"
 Thickness (Metric).....+ .05mm/- .00
 Thickness 72" Nutec 4142.....+/- .002
 Width.....+ .000/.005
 Width (Oversize).....+ .010/.015"
 Width (Metric).....+ .2mm/- .0
 Squares (Regular).....+/- .001"
 Squares (Oversize).....+ .010/.015"

*Widths of more than 50mm are Blanchard ground.

Length 18".....+ .125/.250"
 Length 24".....+ .1875/.375"
 Length 24" Stainless.....+ .500/- .000
 Length 36".....+ .250/.500"
 Length 72" Nutec-42.....+ 1.000/- .000
 Length (Metric).....+ 5mm/+ 8mm
 Squareness Edge......003" per inch
 Squareness End......004" per inch
 (Regular and Oversize)

Please Order From:

Clark & Osborne, LLP
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 6617 Ferguson Avenue
 Indianapolis, IN 46240

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 (317) 253-4486 Fax

sales@clarkandosborne.com
 www.clarkandosborne.com

Size	Cold Drawn W-1	
	Standard Tolerance* (section)	Standard Tolerance (length)
1.000" through 0.750" (largest dim.)	±.0015"	+1/8", -.0"
0.749" through 0.250" (largest dim.)	±.001"	+1/8", -.0"
0.249" and smaller	±.0005"	+1/8", -.0"

*Closer tolerances than standard can be produced by request.