

# 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. Special melting and refining practices are utilized to produce a uniform product with high cleanliness and minimum segregation. The material is tested to rigorous tool steel standards to ensure uniformity of structure and freedom from defects. Meets ASTM A-681.

## Chemistry

Element	Range	Aim
Carbon	.48/.55	.50
Manganese	.50/.80	.70
Phosphorus	0.010 max	.005
Sulfur	.002 max	.0005
Copper	.25 max	

Element	Range	Aim
Chromium	3.10/3.50	3.30
Vanadium	.20/.30	1.35
Molybdenum	1.30/1.55	.50
Silicon	.20/1.00	.25
Tungsten	.30 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 cleanliness and 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 for Ground Flat Stock, 255 BHN maximum for Drill Rod.

## 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 interrupt oil quenched or full oil quenched to attain full hardness.

## Tempering

Double temper one hour per inch of section thickness to desired hardness, two hours minimum per temper. Representative hardness levels after tempering are tabulated below.

### Oil quenched from 1750°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		

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.

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## 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.

The following additional products are available through our authorized distributors.

### DELUXE PLATES

MARSHALLOY MQ®/FM  
 MARSHALLOY™ STD 4142  
 MARSHALLOY™ 4140  
 (Annealed)  
 PRESCO O-1  
 AIRTRUE A-2  
 SUPER 7 MQ® S-7  
 ARISTOCRAT D-2  
 FIRECHROME H-13  
 SUPER 7 S-7

### GROUND FLAT STOCK

PRESCO O-1  
 AIRTRUE A-2  
 ARISTOCRAT D-2  
 SUPER 7 S-7  
 NUTEC 42® 4142  
 FIRECHROME H-13  
 PREMAR 410  
 RUETOM SPECIAL 420  
 PREMAR 440 C  
 MARSHALLCRAT LC

### DRILL ROD

WATERCRAT W-1  
 OILCRAT O-1  
 AIRTRUE A-2  
 SUPER 7 S-7  
 ARISTOCRAT D-2  
 FIRECHROME H-13PH  
 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. For more information, visit us at [www.pmsteel.com](http://www.pmsteel.com).*

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