

# MARSHALLOY™ STD

## Deluxe Plate



### Prehardened Alloy Steel

Precision Marshall's MARSHALLOY™ STD is a prehardened, high-quality, 4140/4142 modified, alloy steel intended for all mechanical uses where improved machinability, uniform hardness and excellent flatness are required. Product hardness range is 262-321 Brinell.

### Typical Analysis

Carbon	.40	Chromium	.95
Manganese	.85	Molybdenum	.20
Phosphorus	.035 max	Silicon	.25
Sulfur	.040 max		

### Applications

MARSHALLOY™ STD is a high quality prehardened alloy steel intended for use in a variety of mechanical applications where the combination of good machinability and medium hardness is required. Specific applications include short run tools and dies, prototype dies, guide rails, back up plates and support tooling, jigs and fixtures and holder blocks. MARSHALLOY™ STD can also be used for molds with less critical cleanliness and polishability requirements.

### Stress Relief

Heat slowly and uniformly to 1000°F and soak one hour per inch of section thickness. Air cool or furnace cool to room temperature.

### Annealing

It is recommended that MARSHALLOY™ STD be annealed prior to rehardening. Heat slowly and uniformly to 1500/1600° for four hours. Cool slowly (50°F per hour max.) to 1200°F and air cool.

### Heat Treating

MARSHALLOY™ STD may be heat treated to higher levels of hardness for higher strength. Preheat to 1250°F and hold for one hour. Heat to 1550/1600°F and soak one half hour when material is up to temperature. Oil quench or air cool to hand warm (approximately 150°F) and temper immediately. After preheating to 1500°F for one half to one hour, heat to 1750/1800°F and soak one half hour when material is up to temperature. Air cool to hand warm (approximately 150°F) and temper immediately.

### Tempering

Temper one hour per inch of section thickness to desired hardness. Representative hardness levels after tempering are tabulated below.

**Oil quenched from 1600°F • Tempered 4 Hours**  
(Section Size — 4" x 4")

Tempering Temperature (°F)	Hardness (RC)
400	42
500	41
600	40
700	39
800	37
900	36
1000	34
1100	29
1200	25

*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 MARSHALLOY™ STD 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

MARSHALLOY™ STD is provided completely decarb free and stress relieved.

#### Finish

Oversize to typical rms 50/75, maximum 125.

#### Sizes

Available in standard thickness increments 1/4" thru 8".

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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