

# KEYSTONE Manufacturing, Inc.

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: www.keystonemfg.com

## TruKey® Shafting Materials

### 1018 Steel

This is the least expensive and most common material. Bars are generally cold drawn which increases bar strength and hardness, but leaves a dull, imperfect surface finish. Bars are not always perfectly round and may have sanding or file marks to make them fit in a bearing. Keystone may substitute a higher grade material without notice.

Bars are generally available in either 12 foot or 20 foot lengths  
 Dia. Tolerance: -.0005, -.002" typical (+0, -.004" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
Cold Drawn	82,000	70,000	20	163
Hot Rolled, TGP	69,000	48,000	38	143

Chemical Properties %	C	Mn	P	S	Si	Cu	N
	0.15 – 0.20	0.60 – 0.90	0.040 max	0.05 max	0.10 max 0.15 – 0.30 for sizes 3"+		

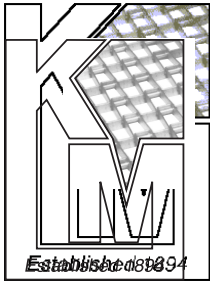
### 1045 T&P Steel

This material offers a higher strength than 1018, while avoiding the higher costs associated with TGP bars. Keystone only carries a limited inventory of this material.

Bars are generally stocked in 20 foot lengths.  
 Dia. Tolerance: -.001, -.004" typical (+0, -.006" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
HR, Turned, and Polished	95,000	60,000	23	197

Chemical Properties %	C	Mn	P	S	Si	Cu	N
	0.43 – 0.50	0.60 – 0.90	0.040 max	0.05 max	0.15 – 0.30		



# KEYSTONE Manufacturing, Inc.

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: [www.keystonemfg.com](http://www.keystonemfg.com)

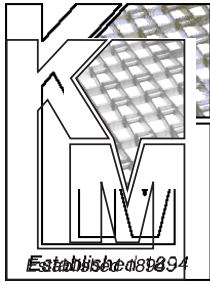
## 1045 TGP Steel

These bars have a higher carbon content which makes them stronger than 1018 Steel. Because they are turned, ground, and polished, the bars have a better surface finish (32 RMS), a tighter diameter, and better roundness compared with the cold drawn bars. Smaller diameters are generally cold drawn and then ground and polished. Larger diameters are hot rolled, then turned, ground, and polished. Bars 1-1/4" and under are straightened after keying. Larger diameters generally do not bow much, but straightness cannot be guaranteed without an additional charge.

Bars are generally stocked in 24 foot lengths, (12 foot for keyed bars).  
 Some diameters are stocked in 20 foot lengths.  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
Drawn, Ground and Polished	102,000	89,000	18	217
HR, Turned, Ground, and Polished	95,000	60,000	23	197

Chemical Properties %	C	Mn	P	S	Si	Cu	N
	0.43 – 0.50	0.60 – 0.90	0.040 max	0.05 max	0.15 – 0.30		



# KEYSTONE Manufacturing, Inc.

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: www.keystonemfg.com

## 1144 Stressproof® (A311 Class B)

This material is stronger than 1045 steel because of the high carbon content and a heavy draft cold drawing process. The addition of sulfur makes these bars more easily machined, and stress relieving makes them generally straighter after the keyway is cut. Stressproof® is a trademark of Niagara LaSalle Steel and only bars made by them can be considered Stressproof®. Bars may be A311 Class B, an alternative specification governed by ASTM. Keystone stocks some diameters in a turned, ground, and polished finish. Keystone only carries a limited inventory of this material.

Bars are generally stocked in 20 foot lengths.  
 Dia. Tolerance: +0, -.002" typical

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
Cold Drawn	125,000	110,000	13.5	262

Chemical Properties %	C	Mn	P	S	Si	Cu	N
	0.40 – 0.48	1.35 – 1.65	0.040 max	0.24 – 0.33	.015 – 0.25	0.15 – 0.30	0.006 – 0.009

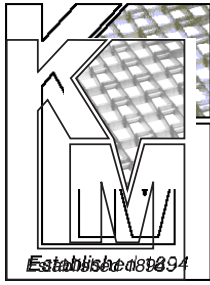
## 4140 QT TGP Alloy Steel

This is the strongest material offered by Keystone Manufacturing, Inc. It is heated then quenched and tempered to a hardness of 26-34 Rc. then ground and polished to size. Keystone will sometimes substitute 4142 or other alloy as long as the mechanical characteristics meet those of 4140. Keystone only carries a limited inventory of this material.

Bars are generally stocked in 24 foot lengths (12 foot for keyed bars)  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
	140,000	125,000	20	265-307

Chemical Properties %	C	Mn	P	S	Si	Cr	Mo
	0.38 – 0.43	0.75 – 1.00	.035 max	.04 max	.15 – .3	.8 – 1.1	.15 – .25



# KEYSTONE Manufacturing, Inc.

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: www.keystonemfg.com

## T-303 TGP Stainless Steel

This is the most popular grade of stainless. It offers good corrosion resistance and is suitable for all food applications. All bars are ground and polished for tight diameter tolerances and roundness. Smaller diameters are cold drawn then ground and polished. Larger diameters are hot rolled then turned, ground, and polished. See below for a comparison of the corrosion resistance of various stainless steels.

Bars are generally stocked in 12 foot lengths. Some diameters in 24 foot lengths.  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	% Reduction in Area	Hardness BHN
	90,000	45,000	30	40	170

Chemical Properties %	C	Mn	Si	Cr	Ni	P	S
	0.15 max	2.0 max	1.0 max	17. – 19.	8 – 10	0.2 max	.15 min

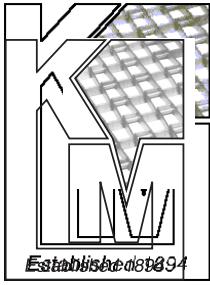
## T-304 TGP Stainless Steel

This is very similar to T-303 SS but offers slightly higher corrosion resistance. It is also harder to machine and to cut. Keystone only carries the most popular diameters of this material. See below for a comparison of the corrosion resistance of various stainless steels.

Bars are generally stocked in 12 foot lengths.  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	% Reduction in Area	Hardness BHN
	85,000	35,000	40	50	150

Chemical Properties %	C	Mn	P	S	Si	Cr	Ni
	.08 max	2.0 max	0.045 max	0.03 max	1.0 max	17.5 – 20.	8 – 12



# KEYSTONE Manufacturing, Inc.

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: www.keystonemfg.com

## T-316 TGP Stainless Steel

A much higher nickel content makes this grade much more corrosion resistant and expensive compared with other grades. All bars are ground and polished for tight diameter tolerance and roundness. Keystone only carries the most popular diameters of this material. See below for a comparison of the corrosion resistance of various stainless steels.

Bars are generally stocked in 12 foot lengths.  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	% Reduction in Area	Hardness BHN
	80,000	30,000	45	55	140

Chemical Properties %	C	Mn	Si	Cr	Ni	Mo	P	S	N
	0.03 -0.08	2.0 max	1.0 max	16.0 – 18.0	10.0 –14.0	2.0 – 3.0	.045 max	.03 max	.1 max

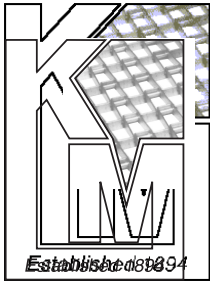
## High Strength Stainless Steel (17-4 PH, H1150)

This grade offers high strength and hardness along with decent corrosion resistance, only slightly lower than that of T-303 SS. All bars are ground and polished for tight diameter tolerance and roundness. Keystone only carries the most popular diameters of this material. See below for a comparison of the corrosion resistance of various stainless steels.

Bars are generally stocked in 12 foot lengths.  
 Dia. Tolerance: -.0005, -.0015" typical (+0, -.003" allowed)

Typical Mechanical Properties	Tensile psi	Yield psi	Elong. In 2", %	Hardness BHN
	145,000	125,000	10	300

Chemical Properties %	C	Mn	P	S	Si	Cr	Ni	Nb + Ta	Cu
	0.07 max	1.0 max	.04 max	.03 max	1.0 max	15 – 17.5	3.0 – 5.	.15 – .45	3. – 5.



# KEYSTONE Manufacturing, Inc.

---

P.O. Box 270 • 668 Cleveland Street  
 Rochester, PA 15074-0270  
 Phone: (724) 775-2227 • Fax: (724) 775-2739  
 Web Site: [www.keystonemfg.com](http://www.keystonemfg.com)

---

## Comparative Corrosion Resistance of Stainless Steels

CHEMICAL	T-303 SS	T-304 SS	T-316 SS	17-4 PH
Humidity	Excellent	Excellent	Excellent	Excellent
Salt Spray (NaCl)	Moderate	Good	Good	Good
Nitric Acid	Good	Good	Good	Good
Sulphuric Acid	Moderate	Moderate	Moderate	Restricted
Phosphoric Acid	Moderate	Moderate	Moderate	Restricted
Acetic Acid	Moderate	Moderate	Good	Moderate
Sodium Hydroxide	Moderate	Moderate	Moderate	Moderate
Sour Oil/Gas		Good	Moderate	Good
Sea Water	Restricted	Restricted	Moderate	Restricted