



## PRODUCT MANUAL

OR 1018

# COLD FINISHED CARBON STEELS-1045 TG&P

**AISI 1045 PRECISION GROUND SHAFTING**                      **UNS G 10450**  
**COLD DRAWN, GROUND AND POLISHED SHAFTING SUPPLIED IN FIBRE TUBES**

### TYPICAL ANALYSIS

C.	Mn.	P.	S.	Si.
.43/.50	.60/.90	.04 MAX.	.05 MAX.	.15/.35

PRECISION GROUND SHAFTING REPRESENTS THE HIGHEST DEGREE OF OVER-ALL ACCURACY, CONCENTRICITY, STRAIGHTNESS, AND SURFACE PERFECTION ATTAINABLE IN COMMERCIAL PRACTICE. AFTER BEING GROUND ON A CENTERLESS GRINDER, BARS ARE POLISHED TO A SURFACE FINISH OF RMS 25 MAX.

### TYPICAL APPLICATIONS

ALL FORMS OF CLOSE TOLERANCE SHAFTING. THIS PRODUCT IS ALSO REFERRED TO AS PUMP SHAFTING, DUE TO ITS HIGH DEGREE OF STRAIGHTNESS, THAT IS SO IMPORTANT IN HIGH-SPEED SHAFTING APPLICATIONS. PRECISION SHAFTING IS ALSO USED FOR MOTOR SHAFTS, CAMSHAFTS MILL SHAFTS, AND SIMILAR APPLICATIONS WHERE HIGH-SPEED WORK NECESSITATES STRAIGHTNESS AND ACCURACY ALONG WITH THE ABILITY TO BE MACHINED UNSYMMETRICALLY WITH PRACTICALLY NO DANGER OF WARPING.

### MECHANICAL PROPERTIES

THE FOLLOWING ARE AVERAGE VALUES AND MAY BE CONSIDERED AS REPRESENTATIVE:

	1"	3"	7"
<b>TENSILE STRENGTH, PSI.</b>	<b>115,00</b>	<b>102,500</b>	<b>90,000</b>
<b>YIELD STRENGTH, PSI.</b>	<b>85,000</b>	<b>79,000</b>	<b>59,000</b>
<b>ELONGATION, % IN 2"</b>	<b>19%</b>	<b>17%</b>	<b>18%</b>
<b>REDUCTION IN AREA, %</b>	<b>32%</b>	<b>42%</b>	<b>35%</b>
<b>BRINELL HARDNESS</b>	<b>223</b>	<b>212</b>	<b>187</b>

### MACHINABILITY

MACHINABILITY RATING IS APPROXIMATELY 70% OS AISI B-1112. AVERAGE SURFACE CUTTING SPEED IS 95 TO 105 FEET PER MINUTE.



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**SHEAR STRENGTH**

THE ULTIMATE SHEAR STRENGTH IS APPROXIMATELY 66% OF THE ULTIMATE TENSILE STRENGTH.

**WELDABILITY**

DUE TO HIGH CARBON CONTENT, THIS MATERIAL IS NOT READILY WELDED. WITH THIN SECTIONS AND FLEXIBLE DESIGN, GAS OR ARC WELDING MAY BE USED WITHOUT PREHEATING, BUT IN JOINTS OVER 1/4" TO 3/4" THICK, PREHEATING IS NECESSARY. TO DEVELOP EQUIVALENT STRENGTH IN A WELD, A LOW ALLOY FILLER IS RECOMMENDED. THE GRADE OF WELDING ROD TO BE USED DEPENDS ON THICKNESS OF SECTION, DESIGN, SERVICE REQUIREMENTS, ETC.

**SIZE TOLERANCE**

ALL TOLERANCES ARE **MINUS**

<b>DIAMETER</b>	<b>TOLERANCES</b>
1-1/2" DIA. AND UNDER	MINUS 0.001"
OVER 1-1/2" DIA. TO UNDER 2-1/2" DIA.	MINUS 0.0015"
OVER 2-1/2" DIA. TO 3" DIA.	MINUS 0.002"
OVER 3" DIA. TO 4" DIA.	MINUS 0.003"
OVER 4" DIA. TO 6" DIA.	MINUS 0.005"
OVER 6" DIA. TO 7" DIA.	MINUS 0.006"

**AVAILABLE IN METRIC AND IMPERIAL SIZES**