



VANGUARD STEEL LTD.

PRODUCT MANUAL

COLD FINISHED CARBON STEELS-1018

AISI/SAE 1018

ASTM A 108 - UNS G 10180

TYPICAL ANALYSIS

C.	Mn.	P.	S.
.15/.20	.60/.90	.04 MAX	.05 MAX.

A LOW-CARBON STEEL, HAVING HIGHER MANGANESE CONTENT THAN CERTAIN OTHER LOW CARBON STEELS, SUCH AS 1020. BEING RICHER IN MANGANESE, 1018 IS A BETTER STEEL FOR CARBURIZED PARTS, SINCE IT PRODUCES A HARDER AND MORE UNIFORM CASE. IT ALSO HAS HIGHER MECHANICAL PROPERTIES AND BETTER MACHINING CHARACTERISTICS. THE HOT ROLLED BARS USED IN THE MANUFACTURE OF THIS PRODUCT ARE OF SPECIAL QUALITY.

MOST COLD FINISHED BARS ARE PRODUCED BY COLD DRAWING. IN THIS PROCESS, OVERSIZE HOT ROLLED BARS, WHICH HAVE BEEN CLEANED TO REMOVE SCALE, ARE DRAWN THROUGH DIES TO THE REQUIRED SIZE. THE LARGER SIZES ARE GENERALLY TURNED AND POLISHED, THE HOT ROLLED BARS HAVING BEEN MACHINE TURNED, RATHER THAN DRAWN, FOLLOWED BY ABRASIVE POLISHING. TURNED AND POLISHED BARS TEND TO HAVE A SOMEWHAT BRIGHTER FINISH THAN COLD DRAWN BARS.

TYPICAL APPLICATIONS

SUITABLE FOR PARTS REQUIRING COLD FORMING, SUCH AS CRIMPING, BENDING, OR SWAGING. ESPECIALLY SUITABLE FOR CARBURIZED PARTS REQUIRING SOFT CORE AND HIGH SURFACE HARDNESS, SUCH AS GEARS, PINIONS, WORMS, KING PINS, RATCHETS, DOGS, ETC.

MECHANICAL PROPERTIES

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

APPROXIMATE MECHANICAL PROPERTIES* ARE:

TENSILE STRENGTH, PSI	80,000/100,000
YIELD POINT, PSI.	70,000/85,000
ELONGATION, % IN 2"	15/25
REDUCTION IN AREA, %	45/55
BRINELL HARDNESS	170/220

* IN THE COLD DRAWN STATE ON A 1" CROSS SECTION.



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MACHINABILITY

1018 HAS A MACHINABILITY RATING OF 78% OF AISI B-1112.
AVERAGE SURFACE CUTTING SPEED IS 130 FEET PER MINUTE.

WELDABILITY

THIS GRADE IS EASILY WELDED BY ALL THE WELDING PROCESSES, AND THE RESULTANT WELDS AND JOINTS ARE OF EXTREMELY HIGH QUALITY. THE GRADE OF WELDING ROD TO BE USED DEPENDS ON THE THICKNESS OF SECTION, DESIGN, SERVICE REQUIREMENTS, ETC.

HARDENING

THIS GRADE WILL RESPOND TO ANY OF THE STANDARD CARBURIZING METHODS AND SUBSEQUENT HEAT TREATMENTS. FOR A HARD CASE AND TOUGH CORE, THE FOLLOWING HEAT TREATMENT IS SUGGESTED: CARBURIZE AT 1650-1700^o DEGREE FAHRENHEIT FOR APPROXIMATELY EIGHT HOURS, COOL IN BOX AND REHEAT TO 1400-1450^o DEGREE FAHRENHEIT QUENCH IN WATER AND DRAW AT 300-350^o DEGREE FAHRENHEIT.

SIZE TOLERANCE

ALL TOLERANCES ARE **MINUS**

DIAMETER	TOLERANCES
1-1/2" DIA. AND UNDER	MINUS 0.002"
OVER 1-1/2" DIA. TO 2-1/2" DIA.	MINUS 0.003"
OVER 2-1/2" DIA. TO 4" DIA.	MINUS 0.004"
OVER 4" DIA. TO 6" DIA.	MINUS 0.005"
OVER 6" DIA. TO 8" DIA.	MINUS 0.006"