



Technical Information: S5

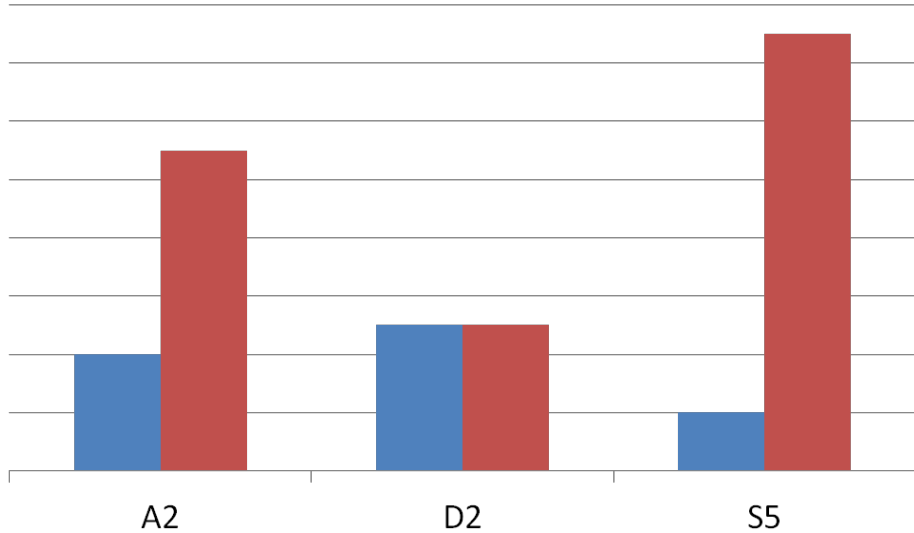
S5 IS AN OIL HARDENING, COLD WORK TOOL STEEL.
THE GRADE IS CHARACTERIZED BY HIGH TOUGHNESS AND RELATIVELY HIGH HARDNESS.
S5 IS USED IN APPLICATIONS REQUIRING A HIGH LEVEL OF IMPACT TOUGHNESS.

TYPICAL CHEMICAL COMPOSITION

CARBON	0.60%	CHROMIUM	0.25%
MOLYBDENUM	0.30%	SILICON	1.90%
VANADIUM	0.20%	MANGANESE	0.85%

TOOL STEEL PROPERTIES COMPARISON

■ Relative Wear Resistance ■ Chipping Resistance



PHYSICAL PROPERTIES

MODULUS OF ELASTICITY.....30 PSI X 10⁶(207 GPa)
DENSITY..... 0.281 LB/IN³
ANNEALED HARDNESS.....200-229 BRINELL HARDNESS (BHN)
MACHINABILITY.....SIMILAR TO O1 TOOL STEEL

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HEAT TREATMENT

ANNEALING

HEAT TO 1450°F, HOLD TWO HOURS
SLOW COOL 20°F/HOUR TO 1100°F
THEN AIR OR FURNACE COOL TO ROOM TEMPERATURE

STRESS RELIEVING

PERFORMED PRIOR OR AFTER MACHINING TO MINIMIZE DISTORTION IN HEAT TREATING
1100/1200°F, HOLD TWO HOURS
THEN AIR COOL TO ROOM TEMPERATURE

HARDENING

OIL QUENCHING REQUIRED.

HIGH HEAT (AUSTENITIZING)

1550/1650°F FOR 20 MINUTES AT HEAT.

QUENCH

QUENCH IN OIL TO 150°F .

TO MINIMIZE DISTORTION, PARTS MAY BE REMOVED AT 400°F THEN AIR COOLED.
TEMPER IMMEDIATELY FOLLOWING QUENCH WHEN MATERIAL REACHES 150°F OR BELOW.

TEMPERING

MINIMUM 400°F TEMPERING TEMPERATURE REQUIRED.
DOUBLE TEMPERING IS REQUIRED.
AIR COOL TO ROOM TEMPERATURE BETWEEN TEMPERS.

TYPICAL HEAT TREAT RESPONSE

TEMPERING TEMP		HARDENING
°F	°C	TEMP
As QUENCHED		1650°F (900°C)
		63/64 HRC
400	205	60 HRC
500	260	59 HRC
600	315	58 HRC
700	371	57 HRC
800	427	52 HRC
900	510	49 HRC
1000	538	45 HRC