



Technical Information: M2

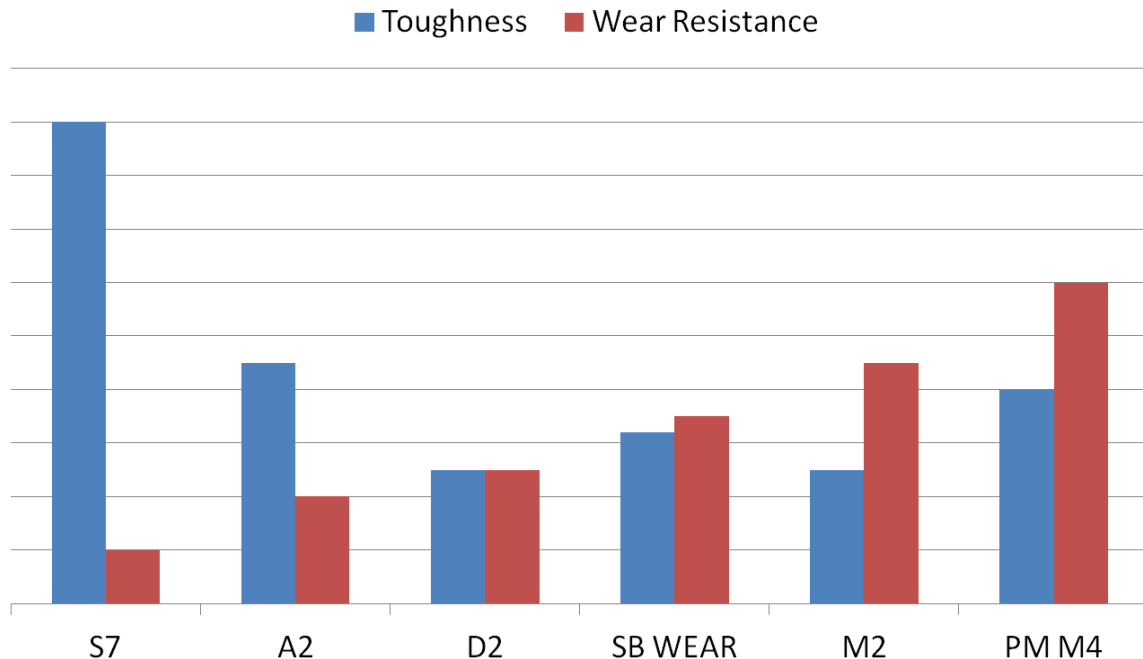
M2 IS A GENERAL PURPOSE HIGH SPEED STEEL AND ONE OF THE MOST COMMON HIGH SPEED STEELS USED.

M2 HAS A GOOD BALANCE OF TOUGHNESS, WEAR RESISTANCE, AND RED HARDNESS
M2'S BALANCE OF WEAR RESISTANCE AND TOUGHNESS ALSO MAKE IT A GOOD COLD WORK MATERIAL FOR A VARIETY OF APPLICATIONS.

TYPICAL CHEMICAL COMPOSITION

CARBON	0.85%	CHROMIUM	4.15%
MOLYBDENUM	5.00%	SILICON	0.30%
VANADIUM	1.95%	MANGANESE	0.30%
TUNGSTEN	6.15%	SULFUR	0.03% MAX

SBSM TOOL STEEL PROPERTIES COMPARISON



PHYSICAL PROPERTIES

MODULUS OF ELASTICITY.....30 PSI x 10⁶(207 GPa)
DENSITY..... 0.294 LB/IN³
ANNEALED HARDNESS.....215-255 BRINELL HARDNESS (BHN)
MACHINABILITY.....SIMILAR TO D2 TOOL STEEL



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HEAT TREATMENT

ANNEALING

HEAT TO 1600°F, HOLD TWO HOURS
SLOW COOL 20°F/HOUR TO 600°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

SALT BATH, PROTECTIVE ATMOSPHERE, OR VACUUM FURNACE EQUIPMENT PREFERRED.

HIGH HEAT (AUSTENITIZING)

2050/2250°F FOR 10-15 MINUTES AT HEAT.

QUENCH

SALT BATH QUENCH TO 1000-1100°F, EQUALIZE, THEN AIR COOL TO 150°F.
VACUUM OR ATMOSPHERE QUENCH RATE OF A MINIMUM 50 DEGREES F PER MINUTE DOWN TO 1200F IS
CRITICAL TO ACHIEVE BEST HEAT TREAT RESPONSE.

TEMPER IMMEDIATELY FOLLOWING QUENCH

TEMPERING

MINIMUM 1000°F TEMPERING TEMPERATURE REQUIRED.
DOUBLE TEMPERING IS REQUIRED, TRIPLE TEMPERING RECOMMENDED.
AIR COOL TO ROOM TEMPERATURE BETWEEN TEMPERS.

TYPICAL HEAT TREAT RESPONSE

TEMPERING TEMP °F	HARDENING TEMP 2050°F	HARDENING TEMP 2150°F	HARDENING TEMP 2250°F
As QUENCHED	64	65	65
1000	64	65	66
1025	63	65	67
1050	62	65	66
1075	61	64	64
1100	60	63	64

LONGITUDINAL SIZE CHANGE

APPROXIMATELY: PLUS 0.22%