



SB Specialty Metals LLC

Your *First Choice* for Specialty Metals

CTS BD1 - Technical Data

General Descriptions:

CTS™ BD1 alloy is a high-carbon chromium knife steel that provides stainless properties with high hardness and excellent wear resistance.

CTS BD1 has a finely balanced chemistry with proprietary additions to improve cutting edge retention and has corrosion resistance similar to Type 410.

Examples of applications:

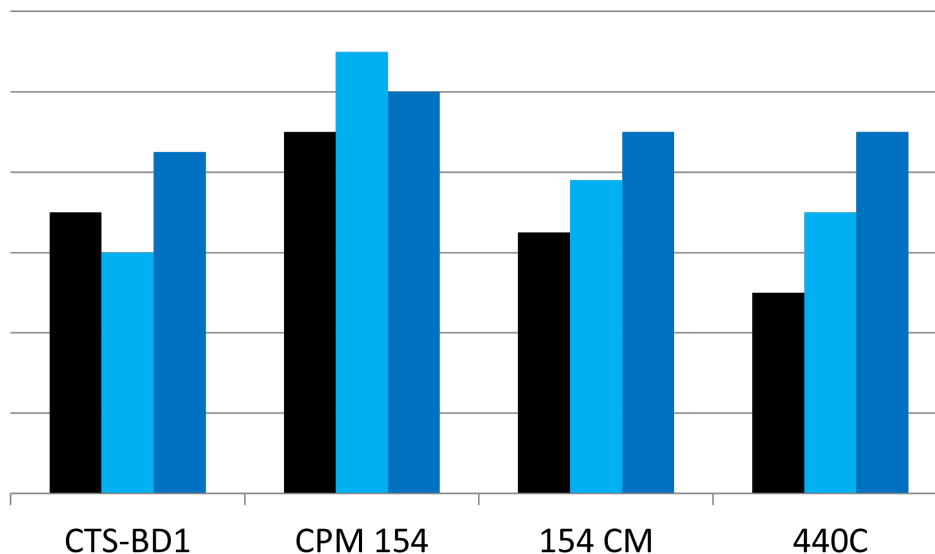
Cutlery, ball bearings and small machinery parts subjected to high wear conditions.

Chemical Composition

Carbon	Phosphorous	Silicon	Molybdenum	Manganese	Sulfur	Chromium
0.85-0.95%	0.04%	1.00%	0.50%	1.00%	0.03%	15.00 - 17.00%

Comparison Chart

■ Toughness ■ Edge Retention ■ Corrosion Resistance



Typical Heat Treat Response

Tempering Temp °F	Austenitizing Temperature		
	1850 °F	1900 °F	1950 °F
As Quenched	61	61	62
300	57	58	60
400	55	55	57
500	54	55	55
600	54	54	55
700	54	55	55
800	54	55	56

Size Changes During Hardening

Hardening Temp (F)	Tempering Temp	HRC	Longitudinal Size Change %
1900 °F	300	58	+0.005%



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Heat Treatment

Annealing

Heat uniformly to 1550-1600 °F. Soak for two hours then cool very slowly in the furnace. Annealed hardness is 223-241 BHN.

Stress Relieving

Stress relieve at 1200 °F for two hours at temperature, then slow cool.

Hardening

Preheat to 1600 °F, let parts equalize. Then ramp up to austenitizing temperature.

High Heat (Austenitizing)

1850-1950 °F, hold at austenitizing temperature for 20-30 minutes.

Quench

Quench in warm oil or cool thin sections in air. Knife blanks can be quenched between aluminum plates. Do not overheat. When overheated, full hardness cannot be achieved.

Tempering

To relieve peak stresses and yet retain maximum hardness, temper at least 2 hours at 300-350 °F. Hardness of 58/59 RC will be obtained.

Physical Properties

Modulus of Elasticity	30.0 x 10 ⁶ psi	Density	0.276 lb/in ³
Annealed Hardness	223 BHN	Machinability	80% of O1