

## ***GATEWAY S7***

### **Cold Work Tool Steel**

**Gateway S7** is a shock resistant alloy tool steel which provides a unique combination of machinability, exceptional toughness, ease of heat treatment and minimum distortion. The material is tested to rigorous tool steel standards to ensure uniformity of structure and freedom from defects. Meets ASTM A-681.

### **Typical Chemistry**

Carbon	.50		Molybdenum	1.40
Manganese	.75		Silicon	.25
Vanadium	.20/.30		Chromium	3.25

### **Applications**

Gateway S7 is suitable for use in applications requiring high impact strength such as shears, punches, blanking dies and chisels. The grade is also used for high-hardness plastic molds and zinc die casting dies.

### **Annealing**

Heat slowly and uniformly to 1500/1550 F and hold two hours. Cool slowly (50 F per hour max) to 1100 F, hold six hours and air cool. Hardness 210 BHN maximum.

### **Heat Treating**

Gateway S7 is subject to decarburization during heat treatment, so a protective atmosphere furnace or vacuum furnace should be used. After preheating to 1200/1250 F, soak material for one half hour per inch of thickness. When material reaches this temperature, heat to 1725 F, then soak material for one half hour per inch of thickness when material is up to this temperature. Air cool or oil quench to hand warm (approximately 150 F), and temper immediately. Note sections over two inches thick should be interrupt oil quenched to attain full hardness.

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### **Tempering**

Double temper one hour per inch of section thickness to desired hardness at a heating rate of two hours per inch. Cool in air to room temperature between the two tempers. Representative hardness levels after tempering are tabulated below.

Oil Quenched from 1725 F - Tempered 4 hours		
(Section Size - 4" X 4")		
Tempering Temperature (F)		Hardness (HRC)
400		56/58
500		54/56
600		53/55
700		52/54
800		52/54
900		51/53
1000		49/52
1100		46/48
1200		39/41

Note: Variations in section size, heating rate, soak time, quench rate and tempering will cause deviations from the above values. Gateway Metals should be consulted for specific applications.

### **EDM**

Electro-discharge machining is widely used in the production of plastic molds and other tooling. However, this operation produces recast, rehardened, and retempered layers on the die surface. It is recommended that Gateway S7 be stress relieved at 50 F below the final tool tempering temperature after electro-discharge machining to temper the rehardened layer produced by EDM.

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