

**D7 cold-work tool steel** is a high-carbon, high-chromium air-hardening tool steel that exhibits exceptional wear resistance. The high carbon and vanadium contents result in numerous, hard vanadium carbide particles in the steel. These carbides exhibit a hardness that is equivalent to approximately 80 to 85 Rockwell C.

## STANDARDS •

- » USA: AISI D7
- » Germany: 1.2380
- » Japan: JIS SKD7
- » Europe: X220CrVMo13-4
- » UK: BS BD7

## CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	Mo	V	P	S
Min	2.15	11.50	0.10	0.10	0.70	3.80	--	--
<b>Typical</b>	<b>2.30</b>	<b>12.50</b>	<b>0.35</b>	<b>0.35</b>	<b>0.95</b>	<b>4.10</b>		
Max	2.50	13.50	0.60	0.60	1.20	4.40	0.035	0.035

## APPLICATIONS •

- » Brick mold liners
- » Flattening Rolls
- » Briquetting Dies
- » Powder compaction Tooling
- » Deep drawing Dies
- » Machine Tool ways

## FORM SUPPLIED •

- » Coil
- » Steel strips
- » Sheets
- » Flat bars
- » Plates
- » Tubes
- » Round bars
- » Seamless pipes

Available surface conditions : hot rolled, ground, peeled, turned, drawn, cold rolled

## HEAT TREATMENT •

● **Annealing** : Heat slowly to 1600° F – 1650° F, and hold for uniformity, furnace cool at a rate of 20° F per hour to 1000° F then air cool. Expect Brinell hardness 235 – 262

● **Hardening** : Preheat to 1500° F and soak until uniformly heated and either transfer or raise furnace temperature to 1850° F 1950° F, and hold 1 hour per inch of greatest thickness. Cool in still air.

● **Tempering** : Temper immediately after quenching, before part has cooled to below 150° F. Parts should be held a minimum of 2 hours per inch of greatest thickness. Double tempering is recommended. For maximum wear resistance temper at 300° F. The above tempering table may be used as a guide. However, since 1/2" dia. specimens were used for this test, it may be found that heavier sections are several points lower.

● **Forging/Rolling**: Preheat to 1500° F and soak thoroughly. Then raise to 2050° F – 2125° F. Do not forge or roll below 1800° F, cool slowly from the forging or rolling temperature. Do not normalize.

Tool	Hardening	Tempering
single edge cutting tools	1220 °C	550-570 °C
multi edge cutting tools	1180-1220 °C	550-570 °C
cold work tools	1050-1150 °C	550-570 °C

## DELIVERY HARDNESS . \_\_\_\_\_

- » Typical soft annealed hardness is 260 HB
- » Cold drawn and cold rolled material is typically 10-40 HB harder

## PROCESSING . \_\_\_\_\_

D7 can be worked as follows :

- » Machining( grinding,turning,milling)
- » Polishing
- » Hot forming
- » Electrical discharge machining
- » Welding(special procedure incl. pre-heating & filler materials of base material composition)

## GRINDING . \_\_\_\_\_

During Grinding, local heating of the surface, which can alter the temper, must be avoided. Grinding wheel manufacturers can provide advise on the choice of grinding wheels.

## SURFACE TREATMENT . \_\_\_\_\_

The Steel Grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

## SIZES AVAILABLE . \_\_\_\_\_



ROUND	Starting From	Upto
DIAMETER	8 mm	500 mm
LENGTH	2000 mm	6000 mm



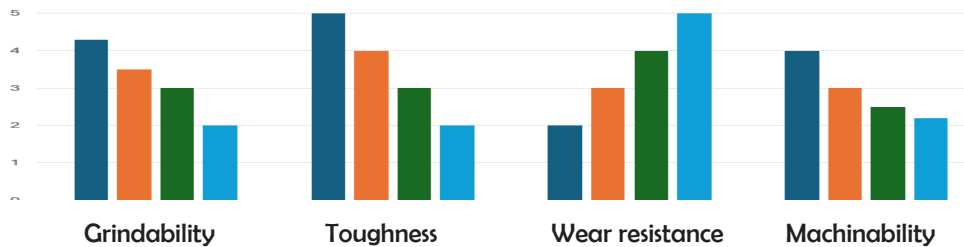
SQUARE BAR	Starting From	Upto
SIZE	8x8 mm	250x250 mm



FLAT	Starting From	Upto
THICKNESS	4 mm	205 mm
WIDTH	20 mm	400 mm

## COMPARATIVE PROPERTIES . \_\_\_\_\_

- A2
- D2
- D3
- D7



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