

**D3 cold-work tool steel** is a high-carbon, high-chromium, oil-hardening tool steel that is characterized by a relatively high attainable hardness and numerous, large, chromium-rich alloy carbides in the microstructure. These carbides provide good resistance to wear from sliding contact with other metals and abrasive materials.

## STANDARDS •

- » USA: AISI D3
- » France: AFNORZ200C12
- » Japan: JIS SKD1
- » Germany: 1.2080

## CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	P	S
Min	2.00	11.00	0.10	0.10	--	--
<b>Typical</b>	<b>2.15</b>	<b>12.25</b>	<b>0.35</b>	<b>0.35</b>		
Max	2.35	13.50	0.60	0.60	0.035	0.035

## APPLICATIONS •

- » Blanking Dies
- » Forming Dies
- » Press tools
- » Pressure pads
- » Punches
- » Bushes
- » Ejector pins
- » Sheer blades

## FORM SUPPLIED •

- » Round bar
- » Flat Bar
- » Plates
- » Square Block

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

## HEAT TREATMENT •

● **Stress-relieving:** Heat to 650-700°C. Soak for 2-4 hours then furnace cool.

● **Annealing :** Heat uniformly to 850-870°C, soak thoroughly, then slow furnace cool at a rate of not more than 25°C per hour to 650°C. The parts may then be air cooled. This should result in a maximum hardness of brinell 248.

● **Hardening :** D3 tool steel is extremely sensitive to overheating during hardening – do not overheat. Pre heat slowly to 800-850°C, the raise rapidly to 950-970°C and soak until completely equalised. Quench in oil.

● **Tempering :** Heat uniformly and thoroughly to the desired temperature and hold for 25 minutes per cm of thickness. D3 can be double tempered after intermediate cooling to room temperature.

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

D3 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



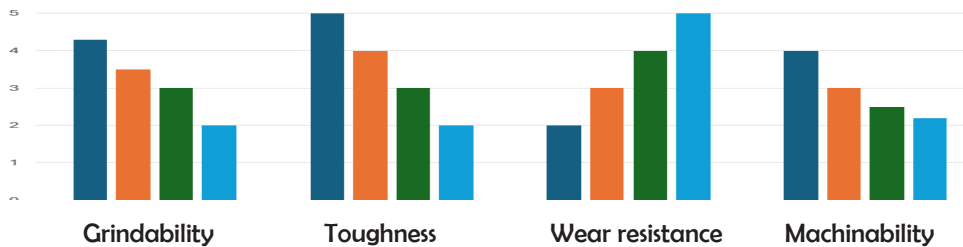
SQUARE BAR	Starting From	Upto
SIZE	8x8 mm	250x250 mm



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

## COMPARATIVE PROPERTIES

- A2
- D2
- D3
- D7



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