

**AISI A7** is a wear resistant tool steel. It is a chromium modified, 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.

## STANDARDS •

- » ASTM A681 (A-7)
- » UNS T30107

## CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	Mo	V	Ni	W	P	S
Min	2.00	5.00	0.15	0.20	0.90	3.90	--	0.50	--	--
<b>Typical</b>	<b>2.40</b>	<b>5.35</b>	<b>0.45</b>	<b>0.50</b>	<b>1.15</b>	<b>4.50</b>		<b>1.00</b>		
Max	2.85	5.75	0.60	0.80	1.40	5.15	0.30	1.50	0.035	0.035

## APPLICATIONS •

- » Brick mould liners
- » sand slinger liners
- » extrusion tools for ceramics
- » Shot blasting equipment liners
- » powder compaction tooling

## FORM SUPPLIED •

- » Round bar
- » Flat Bar
- » Plates

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

## HEAT TREATMENT •

- **Hardening:** critical temperature 1340°F(727°C)
- **Pre-Heating:** heat at a rate not exceeding 400°F per hour to 1200-1300°F and equalize.
- **Austenitizing:** heat rapidly from preheat.  
Furnace or Salt: 1700-1800°F. For maximum toughness use 1700°F, for maximum wear resistance use 1800°F. Soak at temperature for 15 minutes per inch of thickness at 30 minutes.
- **Quenching:** Air or pressurized gas, for air cooling, cool in still air to 150-125°F

- **Tempering:** temper immediately after quenching. Typical temperature is 300°F for maximum wear resistance. Hold at temperature for 4 hours then air cool to ambient temperature. For maximum toughness, double temper, 2 hours plus 2 hours, at temperature above 900°F.
- **Annealing:** Must be performed after hot working and before re-hardening. Heat at a rate not exceeding 400°F per hour to 1500-1550°F and hold at temperature for 1 hour per inch of thickness for minimum 2 hours.

Then cool slowly with the furnace at a rate not exceeding 50°F per hour to 1000°F. Continue cooling to ambient temperature in the furnace or in air.

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

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

A7 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.

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

- » Typical soft annealed hardness is 255 HBW
- » Cold drawn and cold rolled material is typically 10-40 HB harder

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



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

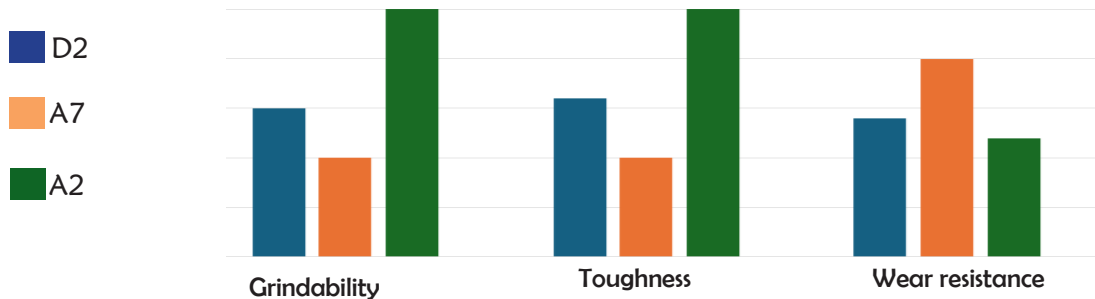


SQUARE BAR	Starting From	Upto
SIZE	8x8 mm	250x250 mm
LENGTH	2000 mm	6000 mm



FLAT	Starting From	Upto
THICKNESS	4 mm	205 mm
WIDTH	20 mm	400 mm
LENGTH	2000 mm	6000 mm

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



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