

**AISI P20 Steel** Plate Material is a versatile, low-alloy tool steel that is characterized by good toughness at moderate strength levels. The special purpose mold steel P20 steel plate is commonly used for plastic injection mold cavities and tooling and for die casting dies for zinc.

## STANDARDS •

- » USA: AISI P20
- » France: AFNOR Z210CW12-01
- » China: 40CrMnNiMo7
- » Germany: 1.2311

## CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	Mo	P	S
Min	0.35	1.80	0.20	1.30	0.15	--	--
<b>Typical</b>	<b>0.40</b>	<b>1.95</b>	<b>0.30</b>	<b>1.45</b>	<b>0.20</b>		
Max	0.45	2.10	0.40	1.60	0.25	0.035	0.035

## APPLICATIONS •

- » Die holders
- » Casting Dies
- » Backers
- » Shoe Blocks
- » Mold frames
- » Injection molds
- » Bolsters

## FORM SUPPLIED •

- » Round Bar
- » Square Bar
- » Plates
- » Sheets
- » Flat Bars

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

## HEAT TREATMENT •

● **Stress-relieving:** Preheating: Because mold steel P20 steel plate is sold in a pre-hardened condition, hardening heat treatment is not necessary. After machining and intermittently during service, the steel must be thermally stress relieved by heating to 900°F (482°C), equalizing and holding for one hour per inch (25.4mm) of thickness, and cooling in air to ambient temperature.

● **Hardening:** Critical Temperature: Ac1: 1405°F (763°C) Preheating of P20 metal: Heat at a rate not exceeding 400°F per hour (222°C per hour) to 1150-1250°F (621-677°C) and equalize.

Austenitizing (High Heat)-Heat rapidly from the pre-heat to 1550°F (843°C). Soak for 30 minutes for first inch (25.4mm) of thickness, plus 15 minutes for each additional inch (25.4mm).

● **Quenching:** Pressurized gas, or interrupted oil to 150-125°F (66-51°C). For oil, quench until black, at about 900°F (482°C), then cool in still air to 150-125°F (66-51°C).

● **Tempering:** P20 tool steels are tempered at 482-593°C (900 to 1100°F) for a Rockwell C hardness of 37 to 28.

● **Annealing:** for AISI P20 tool steels takes place at 760-788°C (1400 to 1450°F) and then the steels are cooled slowly in the furnace at a temperature less than 4°C (40°F) per hour.

Tool	Hardening	Tempering
single edge cutting tools	1220 °C	560 °C
multi edge cutting tools	1180-1220 °C	560 °C
cold work tools	1050-1150 °C	560 °C

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

- » Typical soft annealed hardness is 235 HB
- » Cold drawn and cold rolled material is typically 10-40 HB harder

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

P20 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)

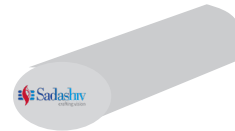
## GRINDING . \_\_\_\_\_

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

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