

**H12 Steel** is a deep-hardening, air hardening steel that exhibits minimal size change during heat treatment. H12 tool steel material has good resistance to thermal fatigue cracking (heat cracking) and excellent resistance to gross cracking and thermal shock when water cooled in service.

## STANDARDS •

- » USA: AISI H12
- » Japan: JIS SKD62
- » Germany: 1.2605
- » UK: BH12

## CHEMICAL COMPOSITION •

|                | C           | Cr          | Si          | Mn          | Mo          | V           | W           | P     | S     |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|-------|
| Min            | 0.30        | 4.75        | 0.80        | 0.20        | 1.25        | 0.20        | 1.00        | --    | --    |
| <b>Typical</b> | <b>0.35</b> | <b>5.10</b> | <b>1.00</b> | <b>0.40</b> | <b>1.50</b> | <b>0.35</b> | <b>1.35</b> |       |       |
| Max            | 0.40        | 5.50        | 1.25        | 0.60        | 1.75        | 0.50        | 1.70        | 0.035 | 0.035 |

## APPLICATIONS •

- » Extrusion Tools
- » Forming Dies
- » Press Dies
- » Hot Shear Blades
- » Hot Punch tool
- » Dies for die carbide
- » Immediate Roller for Cold Rolling

## FORM SUPPLIED •

- » Flat
- » Square
- » Round

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

## HEAT TREATMENT •

● **Stress-relieving** : Stress relieving to remove machining stresses should be carried out by heating H12 steel to approx.650°C, holding for 1-2 hours at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

● **Annealing**: Heating Steel H-12 slowly and uniformly to 845~900°C, furnace cooling to 540°C at a rate 10~20°C/hr. Hardness HB 229 max

● **Hardening** : Preheating (1): Heat H-12 steel to approx. 540~650°C, holding 30 minutes per 25mm. Preheating (2): Heat H12 tool steels to approx. 845~870°C, holding 30 minutes per 25mm. Austenitizing: Heat steel H12 to approx. 1010~1050°C, holding 30 minutes per 25 mm. Quenchant: By oil or air.

● **Tempering**: temperature: 520-700°C hold at least 2 hours, air cooling and double tempering.

● **Forging**: of H12 Tool Steel

Hot forming temperature: 1100-850°C.

| 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 250 HB
- » Cold drawn and cold rolled material is typically 10-40 HB harder

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

H12 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 |



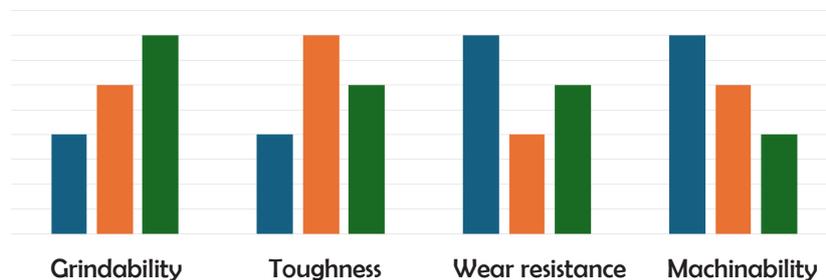
| SQUARE BAR | Starting From | Upto       |
|------------|---------------|------------|
| SIZE       | 8x8 mm        | 250x250 mm |



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

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

- H12
- H13
- H21



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