



## Cold Working Tool Steel

**TG D-2**  
(DIN-1.2379)



**Steel Properties :** 12% ledeburitic chromium steel. Maximum wear resistance, good toughness. Best cutting-edge endurance and resistance to tempering, can be nitrided after special heat treatment

**Applications :** Thread rolling rolls and thread rolling dies, cold extrusion tools, cutting and stamping tools for sheet thicknesses up to 6mm, precision cutting tools up to 12 mm. Cold pilger mandrels, circular-shear blades, deep-drawing tools, pressure pads and highly resistant plastic moulds.

E.S.R. materials, high compression strength and fine robustness. The spheroidal annealed make it easily processed by shearing and cutting with no craze while processing.

Applied in thickness no less than 2mm punch mould, all kind of small mould for shearing and cutter together with screw rolled or slappered mould as well as some other forming mould like rulers.

**Similar Steel Grade :**

CHINA	BRAZIL	AUSTRIA	GERMANY		SLOVANIA	ITALY	JAPAN			S.KORIA	CHEZ. REP
TG	VILLARES	BOHLER	DEW	GRODITZ	RAVNE	LUCCHINI	HITACHI	NIPPON	SANYO	DOOSAN	POLDI
D2	VD2	K110	1.2379	1.2379	OCR12VM	DJY052379	SLD	KD11V	QCD2	STD 11	2002K

**Chemical Composition: (%)**

IS	Chemical Analysis Typical Value % (Min - Max)											Delivery Condition	
	C	S	P	Si	Mn	Ni	Cr	Mo	V	W	other	Heat Treatment	Hardness
D2	1.45-1.60	≤0.03	≤0.03	0.10-0.60	0.20-0.60	***	11.0-13.0	0.70-1.00	0.70-1.00	***	***	Annealed	≤Hb255

**Production Process:**

**Round Bar :**

EAF→LF→VD→ESR→BLOOM FORGED (5TONS HAMMER) → [ Fogred Annealed Turned : φ81.0-1000mm  
Hot Rolled & Annealed Peeled : φ14.5-80.0mm  
Cold Drawn / Centreless Ground : φ2.0-14.4mm ] → ANNEALED CONDITION

**Flat Bar :**

EAF→LF→VD → [ FORGED (5TONS HAMMER)  
HOT ROLLED (910) ] → HOT ROLLED (850) → ANNEALED CONDITION

**UT STANDARD :**

SEP 1921, (DEC.84)E/e

**REDUCTION RATIO :**

As 1:4 or 1:5

**DELIVERY STATUS :**

As Hot rolled & forged, delivery condition : Annealed

**SIZE : Rounds**

Cold Drawn/Centreless Ground Bar	Hot Rolled & Annealed Peeled	Forged Annealed Turned
φ 2.0 - 14.4mm	φ 14.5 - 80.0mm	φ 81.0 - 1000mm

**SIZE : Flats**

Thickness	Width
5mm - 150mm	5mm - 810mm

**SIZE : Sheets**

Thickness	Width	Length
0.5mm to 12mm	810mm	2500mm

**1) Heat Treatment Condition :**

Quenching temperature : 1000-1040°C  
Cooling Medium : Oil-cooling or air-cooling  
Tempering temperature : 180-200°C, by two times;  
Tempering Hardness : 63.0HRC

**2) Heat Treatment Condition :**

Quenching temperature : 1060-1080°C  
Cooling Medium : Oil-cooling or air-cooling  
Tempering temperature : 500-540°C, by two times;  
Tempering Hardness : 59.0 - 61.0HRC