



## Lower Alloy High Speed Steel

**TG 4241/  
TG 4341**



**Steel Properties :** It is mainly used to produce drill, tap, saw bit and high efficiency wood tool.

**Applications :** It is an economical low alloy high-speed steel with good red hardness, good toughness and thermal plasticity. It is generally used soft and moderate intensity metal.

**Chemical Composition : (%)**

(Special grade)	C	S	P	Si	Mn	Cr	Mo	V	W
TG4241	0.90-0.95	≤0.020	≤0.030	0.80-1.20	0.25-0.40	4.00-4.50	1.00-1.20	0.80-1.00	1.80-2.50
TG4341	0.83-0.93	≤0.020	≤0.030	0.70-1.00	0.20-0.40	3.80-4.40	2.50-3.50	1.20-1.80	3.50-4.50

**Production process:**

EAF→LF→VD→ESR→BLOOM IN FOLLOWING MACHINE :  
QUICK FORGING (12.5MN), HAMMER, PRECISION FORGING

Precision Forging	: φ 81 - 255mm
Hot Rolled & Annealed Peeled (HRAP)	: φ 14.5 - 80mm
Hot Rolled & Sand Blasted (Coil)	: φ 2.0 - 13.5mm
Cold Drawn / Centreless Ground	: φ 2.0 - 14.4mm

**UNDER ANNEALED CONDITION :**  
Hardness : HB205-255

**REDUCTION RATIO :**  
As 1:4 or 1:5

**DELIVERY STATUS :**  
As Cold drawn / Hot rolled / forged, in annealed condition.

**SIZE : Rounds**

Cold Drawn/Centreless Ground Bar	Hot Rolled Bar	Forged bar	Coil
φ 2.0 - 14.4mm	φ 14.5 - 80.0mm	φ 81.0 - 255.0mm	φ 2.0 - 13.5mm

**SIZE : Flats**

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

**SIZE : Squares**

4mm to 100mm

**SIZE : Sheets**

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

**HEAT TREATMENT :**

**Annealing:**

Annealing temperature: 860-880°C, keep this temperature by 2-4 hours, then cooling to 600°C in the speed of less than 30°C/h

If after cold drawn process, suggest add stress relieving annealing process Under the temperature of 600-700°C, keep this temperature by 2 hours.

Quenching & Tempering (salt bath)

**Quenching:**

Pre-heating in two steps:

Heating temperature under : 400-500°C and 850-900°C

TG4241 austenitizing temperature: 1150-1180°C

TG4241 austenitizing temperature: 1160°C-1190°C

Heating coefficient 10-15 sec/mm, quenching under 580-620°C, then cooling to room temperature.

Quenching temperature difference in 5-10°C between TGM2, TGM2A;

TGM2A's quenching temperature is higher than TGM2

**Tempering:**

Tempering temperature under: 540-560°C, tempering 3 times, each time 1 hour, then cooling to room temperature.