



Hot Working Tool Steel

PREMIUM GRADE TGE13



Smelting method : EAF+LF+VD+ESR

Main characteristics : Excellent heat resistance and crack resistance, quite high tenacity, quite high ductility, favorable isotropic, favorable processability and polishability as well as favorable dimension stability during heat treatment.

Major applications : • For various metal pressure casting molds, for example: automobile engine cylinder body, cylinder cover, gearbox shell molds; • Hot extrusion molds, mainly for hot extrusion of aluminium profiles; • High-quality plastic molds, for example, high abrasion resistance plastic molds for automobiles.

Equivalent Grade from BOHLER W302 ISOBLOC

Chemical constituent (%):

C	Si	Mn	Cr	Mo	V	P	S
0.38	0.90	0.35	5.0	1.35	0.95	≤0.015	≤0.002

Physical Property :

Room temperature density (Kg/m <sup>3</sup> )	Specific heat of room temperature (J/Kg.K)	200°C thermal conductivity (W/m.K)	Elastic modulus (N/mm <sup>2</sup> )	Linear expansivity (x10 <sup>-6</sup> K)	
				20 ~ 200°C	20 ~ 400°C
7.80	430	22	215,000	11.3	11.9

Ultrasonic flaw detection: As per SEP1921: E/e flaw detection or GB/T4162 Class AA flaw detection, i.e., flat bottom hole ≤φ 1mm, no flaw detection noise wave shall appear or please comply with customer regulation.

Purity :

Class A		Class B		Class C		Class D	
Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse
1.0	0.5	1.5	1.0	1.0	1.0	1.5	1.0

Delivery state : (1) Delivery hardness: delivery under annealing state, delivery hardness ≤255HB; (2) Organization state and impact power requirement: the organization and segregation shall comply with North American Die Casting Association No. 207 criterion; (3) Impact power sample: please sample according to the central part of steel. The samples shall be treated according to criteria in North American Die Casting Association, making sure that hardness of samples at 45±2HRC. Dimension of sample: 7\*10\*55. Gapless.

Specification (diameter, thickness mm)	Average impact power at the center part not less than (J)	Minimum impact power per sample not less than (J)
>60-300	240	150
>300	180	100

Supply specification

Product Name	Specification/mm	Material
Forged round bar	φ 71-810	TGE13
Forged module	(120-400) x (300-800)	TGE13
Rolled round bar	φ 14.5-70	TGE13
Rolled flat bar	(12-120) x (200-810)	TGE13

Thermal treatment

Softening annealing	Quenching	Tempering
Heating to 850°C for heat insulation; cooling to 600°C at 10°C/h air cooling	1020-1040°C quenching; high-speed gas quenching or hot oil cooling	Selecting tempering temperature according to hardness requirements; please conduct tempering for 3 times; prevent tempering under 425-550°C

