

Physical properties

◆ Thermal expansion rate

Quenching : 830℃ × 1 h, Gas cooling
Tempering : 180℃ × 1 h, Twice
Hardness : 63 HRC

Temp.	20~100℃	20~200℃	20~300℃	20~400℃	20~500℃	20~600℃
×10 ⁻⁶ /K	11.9	13.1	13.6	10.3	10.6	11.3

◆ Thermal conductivity

Temp.	25℃	100℃	200℃	300℃	400℃	500℃	600℃
W/m · K	27.1	29.3	30.3	34.8	34.7	32.9	31.8

*Accuracy of repeated measurements is about ± 10%.

◆ Specific heat

Temp.	25℃	100℃	200℃	300℃	400℃	500℃	600℃
J/kg · K	479	519	545	574	605	639	713

◆ Young's modulus / Rigidity modulus / Poisson's ratio (25℃)

Young's modulus	Rigidity modulus	Poisson's ratio
200 GPa	77 GPa	0.30



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The product characteristics included in this brochure are the representative values based on the result of our measurements, and do not guarantee the performance in use of the products. Please inquire the latest information to our department in charge as the information of this brochure is updated without previous notice as needed.
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Daido's Cold Work Die Steel Series

YK30TM



Oil Hardening Carbon Tool Steel

Features

- ◆ Stable quality is built in by vacuum degassing in refining process.
- ◆ Good hardenability is assured in oil hardening (less susceptible to deformation or quenching crack).
- ◆ Excellent toughness and resistance to wear mean longer service life for tools made of YK30.
- ◆ Mn and Cr are added to SK105, realizing superior hardenability.

Main applications

Application	Tempering temp. (℃)
Gauges, razor blades, files and cutting tools	150~200
Trimming dies, press dies, bending dies and punch dies	180~230
Chisels and cutters for wood working	200~250

Chemical composition

DAIDO Brand	Applicable JIS	Chemical composition (%)							
		C	Si	Mn	P	S	Cu	Ni	Cr
YK30	SKS93	1.00 1.10	≤ 0.50	0.80 1.10	≤ 0.030	≤ 0.030	≤ 0.25	≤ 0.25	0.20 0.60
YK3	SK105	1.00 1.10	0.10 0.35	0.10 0.50	≤ 0.030	≤ 0.030	≤ 0.25	≤ 0.25	≤ 0.30

Heat treatment

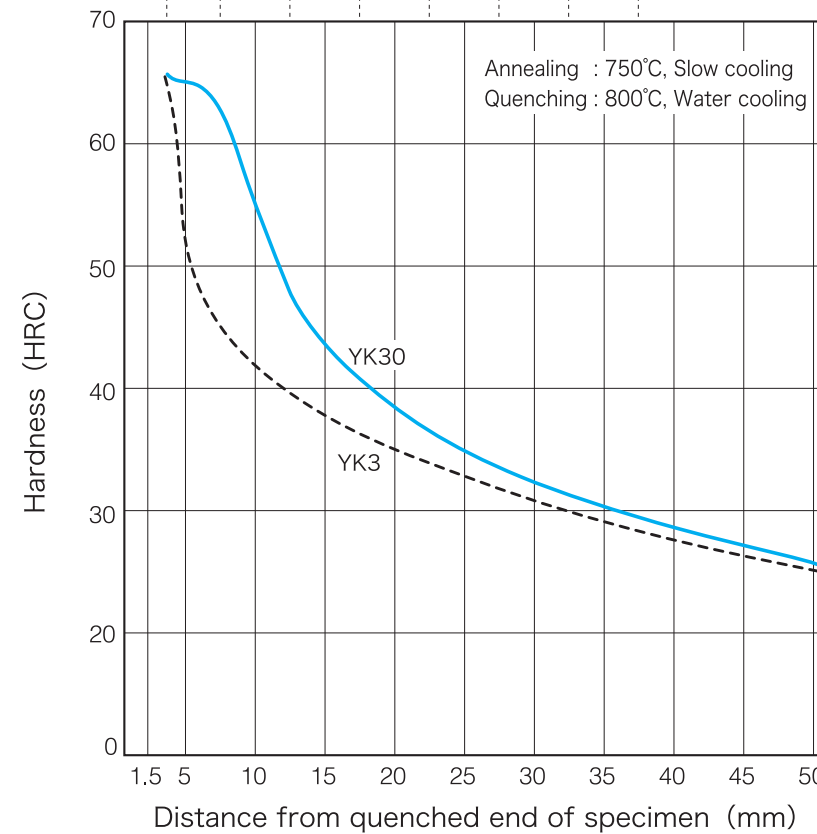
Re-forging Temp. (℃)	Heat treatment (℃)			Hardness		Transformation Temp. (℃)		
	Annealing	Quenching	Tempering	Annealed	Quenched & Tempered	Ac	Ar	Ms
850~1050	750~780 Slow cooling	790~850 Oil quenching	150~200 Air cooling	≤ 217 HBW	≥ 63 HRC	725~765	700~600	150



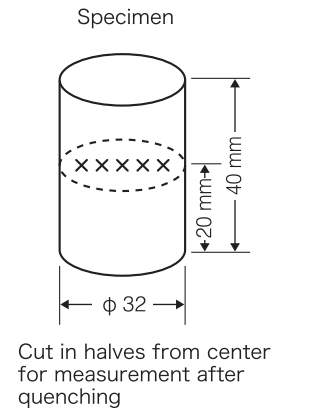
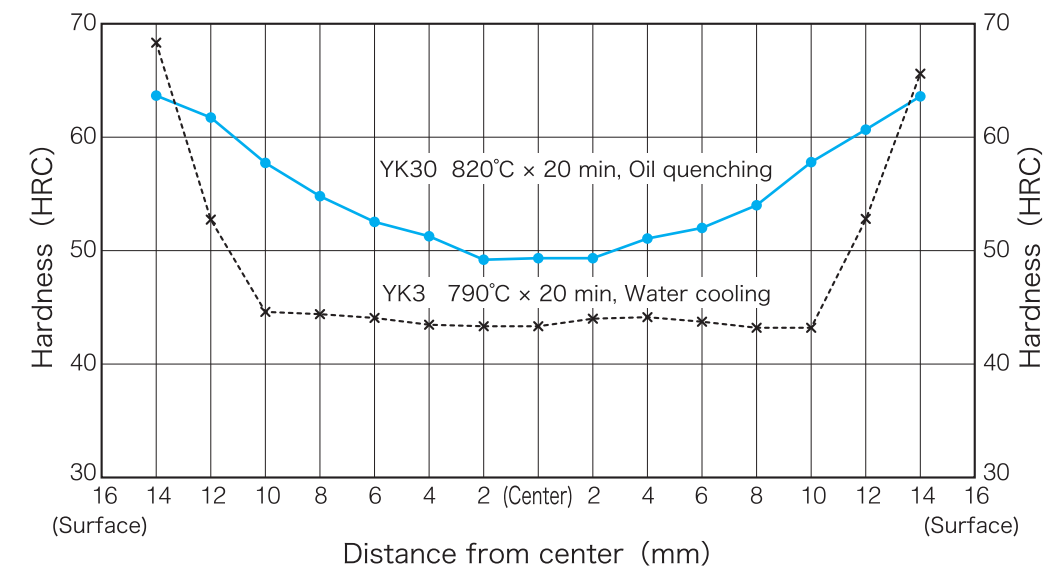
Properties

Hardenability (End quenching method)

Diameter at which each hardness is obtained on the surface (mm)								Quenching method
6.4	12.7	38.1	73.7	127.0	165.1	—	—	Oil quenching (stirring)
3.8	7.6	20.3	33.0	44.5	66.0	83.8	—	Oil quenching
15.2	63.5	—	—	—	—	—	—	Water cooling (stirring)
10.2	15.2	45.7	94.0	228.6	—	—	—	Water cooling

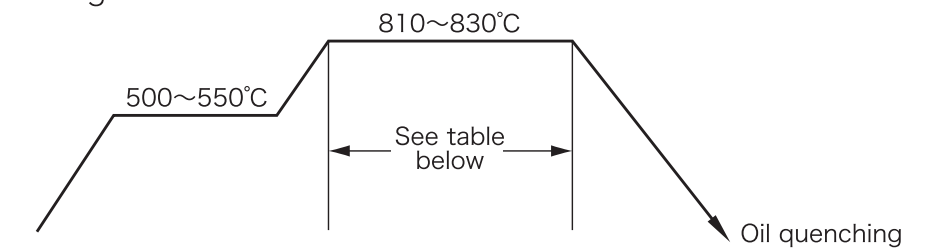


Hardening depth (U curve)



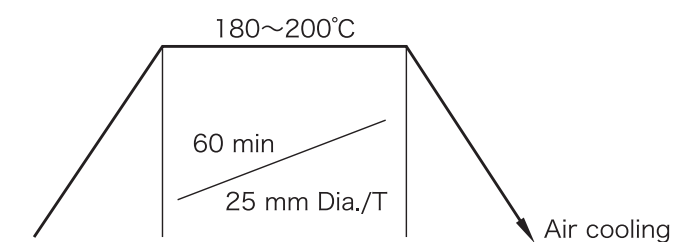
Standard heat treatment

◆ Quenching

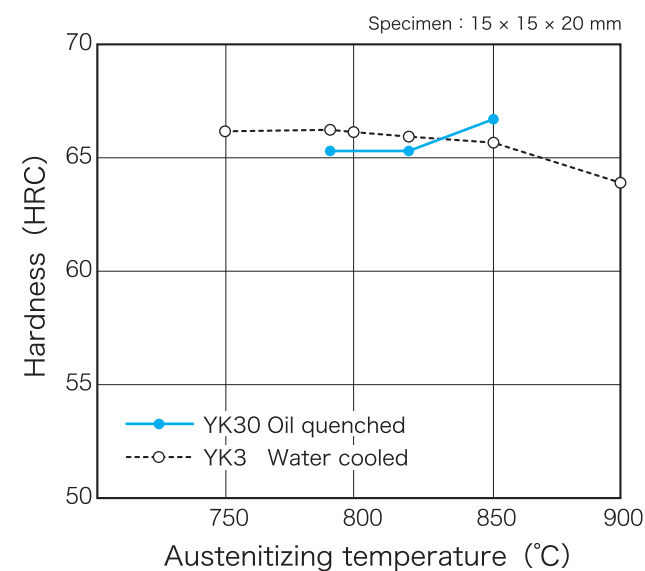


Salt bath		Electric furnace Gaseous atmosphere furnace		Packaged heating
Dimension Dia./T (mm)	Immersion time (min)	Dimension Dia./T (mm)	Time (min)	Soaking time
10	5~ 8	Up to 100	20~30 min	20~45 min Box wall (T: 25 mm)
20	8~10		25 mm	
30	10~15		25 mm	
50	20~25	Over 100	10~20 min	
100	30~40		25 mm	

◆ Tempering



Quenching hardness



Tempering hardness

