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Document Disclaimer

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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GOA

Excellent Hardenability and Wear Resistance
Special Tool Steel

Features

- 1 Stable quality is built in by vacuum degassing in refining process.
- 2 High hardness is attained even with products of relatively large size because hardenability is better than of JIS SKS3
- 3 Fine tungsten and chrome carbides are distributed uniformly, excellent wear resistance.
- 4 Complete spheroidized microstructure resulting in excellent machinability.

Applications

Application		Use hardness (HRC)
Cold press	Trimming dies	58~62
	Forming dies	58~62
	Punch	58~62
Coining dies		58~62
Shear blade	Sheets (less than 6 mm)	58~62
	Plates (6~8 mm)	55~60
Gauges		60~64



DAIDO STEEL

Chemical composition



DAIDO Brand	Chemical composition (%)						
	C	Si	Mn	Cr	Mo	W	Special elements
GOA	0.9	0.3	1.2	0.5	0.1	0.5	Additives

Impurities: P ≤ 0.030, S ≤ 0.030, Cu ≤ 0.25, Ni ≤ 0.25

Heat treatment

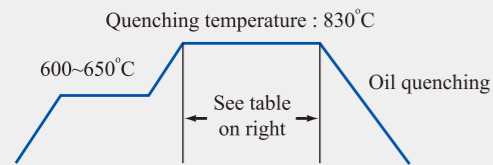


Re-forging temperature (°C)	Heat treatment temperature (°C)			Hardness		Transformation temperature (°C)		
	Annealing	Quenching	Tempering	Annealing (HBW)	Quenching tempering (HRC)	Ac	Ar	Ms
1100~850	750~800 Slow cooling	800~850 oil quenching	150~200 Air cooling	≤ 217	≥ 61	708~726	----	160 (Austenitized at 825)

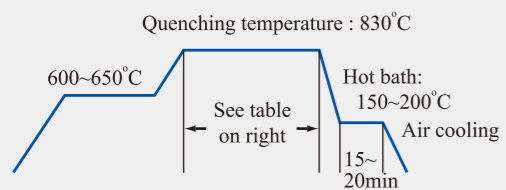
[Standard heat treatment]

● Quenching

Ordinary quenching

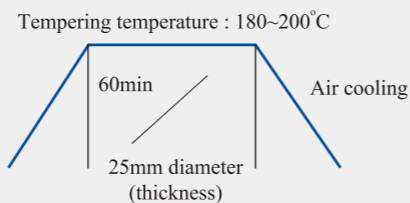


Martempering (Hot bath quenching)



Spheroidized annealing (x 400)

● Tempering



Tempered more than twice in case of wire cutting.

Salt bath		Electric furnace Gaseous atmosphere furnace		Packaged heating
Dimension Diameter/thickness (mm)	Immersion time (min)	Dimension Diameter/thickness (mm)	Time (min)	Soaking time
10	5~ 8	25	30	20~45min.
20	8~10	100	80	Box wall thickness: 25mm
30	10~15	125	100	
50	20~25	200	120	
100	30~40	500	200	

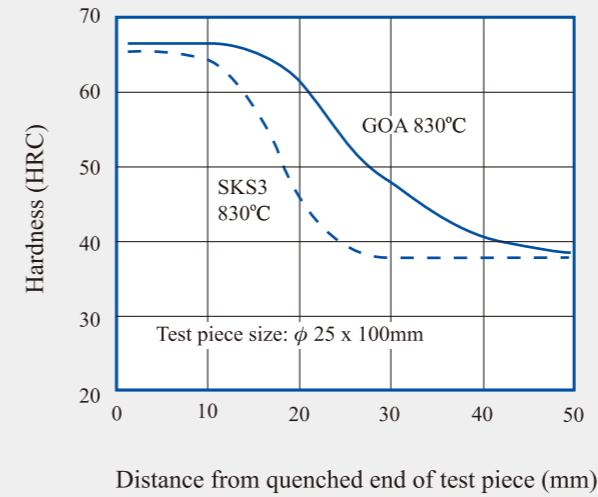


After quenching tempering (x 400)

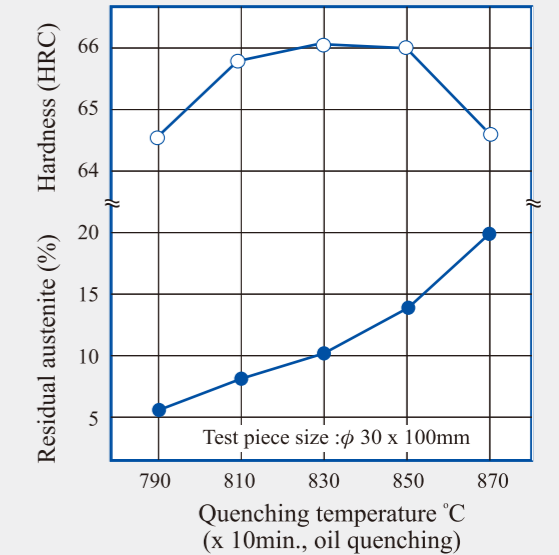
Technical data



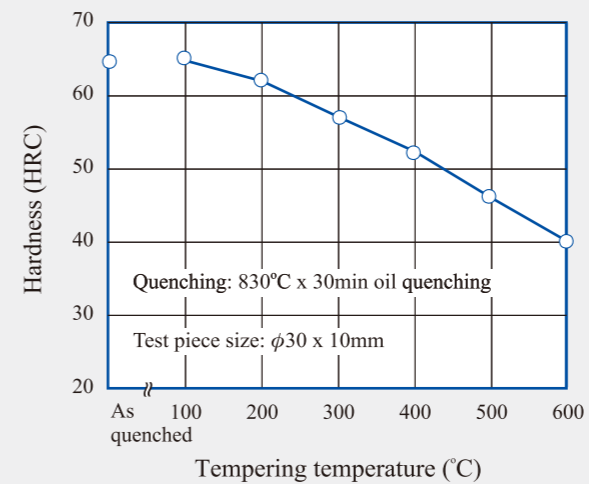
● Hardenability curve (End quenching method)



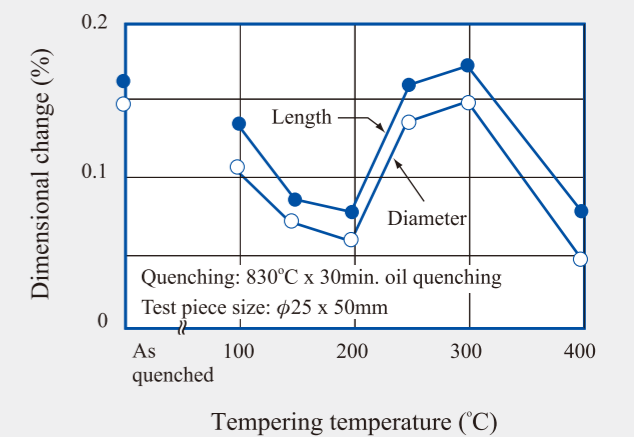
● Hardening temperature, hardness attained and residual austenite



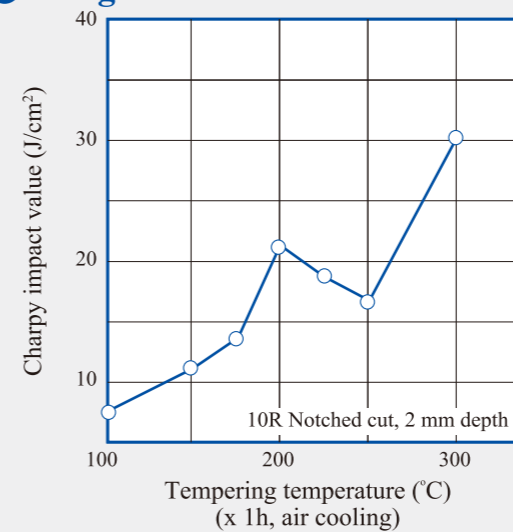
● Tempering curve



● Dimensional change



● Toughness



● Wear resistance

