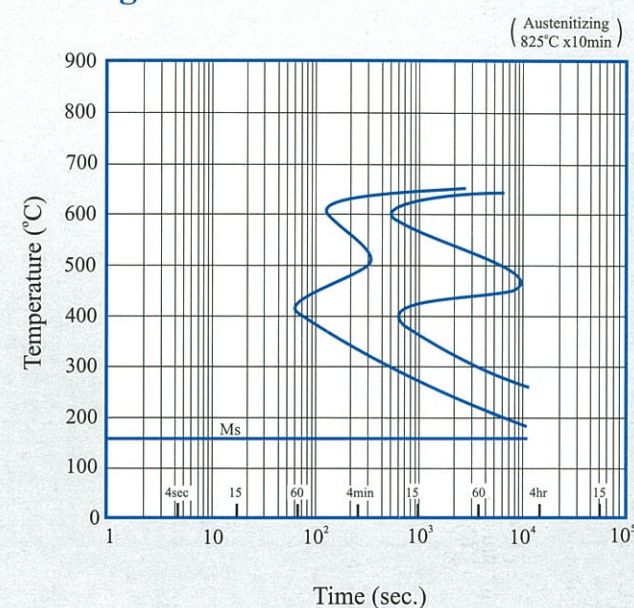




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## Excellent Hardenability and Wear Resistance Special Tool Steel

- 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 that of JIS SKS3**
- 3 **Fine tungsten and chrome carbides are distributed uniformly, excellent wear resistance**
- 4 **Complete spheroidized microstructure resulting in excellent machinability**

| 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 6mm) | 58~62              |
|              | Plates (6~8mm)         | 55~60              |
| Gauges       |                        | 60~64              |



# Chemical Composition



| DAIDO Brand | C    | Si  | Mn  | Cr   | Mo   | W    | Special elements |
|-------------|------|-----|-----|------|------|------|------------------|
| GOA         | 0.86 | 0.3 | 1.2 | 0.50 | 0.13 | 0.50 | Additives        |

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

# Heat Treatment

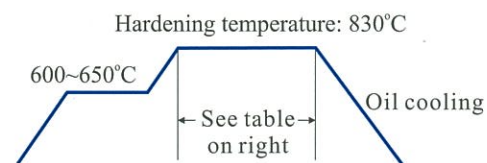


| Forging temperature (°C) | Heat treatment temperature (°C) |                        |                        | Hardness       |                         | Transformation temperature (°C) |       |                            |
|--------------------------|---------------------------------|------------------------|------------------------|----------------|-------------------------|---------------------------------|-------|----------------------------|
|                          | Annealing                       | Hardening              | Tempering              | Annealing (HB) | Quench and temper (HRC) | Ac                              | Ar    | Ms                         |
| 1100~850                 | 750~800<br>Slow cooling         | 800~850<br>Oil cooling | 150~200<br>Air cooling | ≤ 217          | ≥ 61                    | 708~726                         | ----- | 160<br>(Austenitizing 825) |

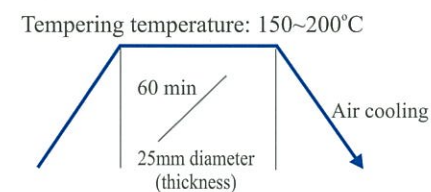
## [Standard Heat Treatment]

### ● Hardening

#### Ordinary hardening

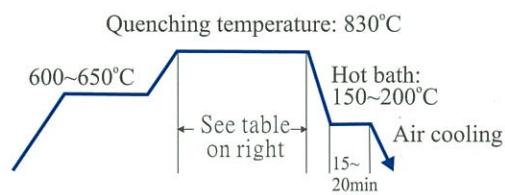


#### Tempering

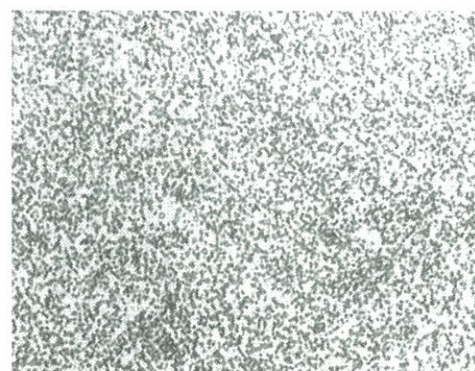


Tempered more than twice in case of wire cutting

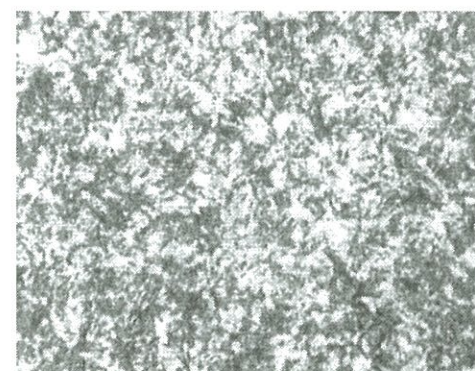
### ● Martempering (hot bath quenching)



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



Spheroidized annealing  
(x 400)

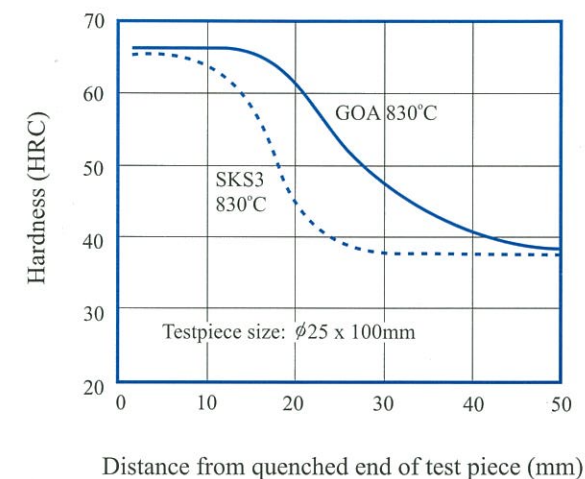


After quench-and-temper  
(x 400)

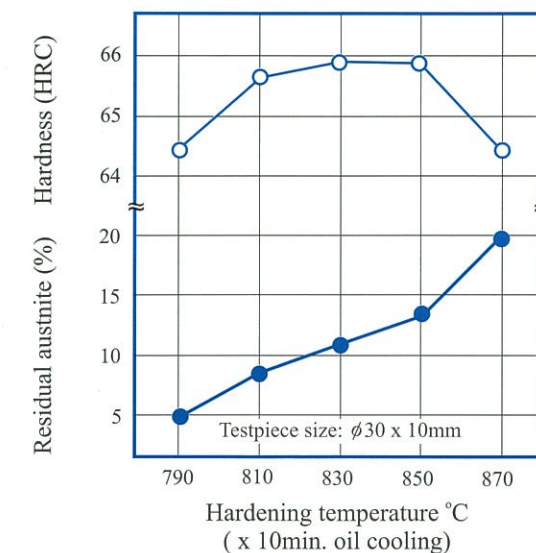
# Technical Data



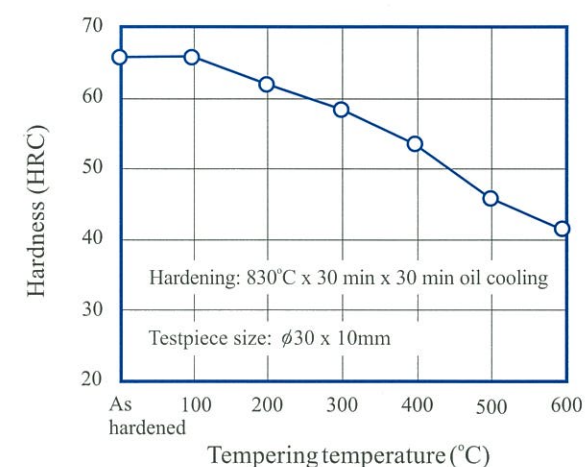
### ● Hardenability Curve (End quenching method)



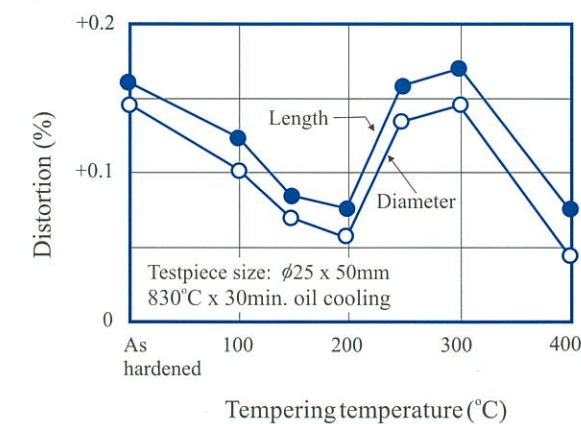
### ● Hardening Temperature, Hardness Attained and Residual Austenite



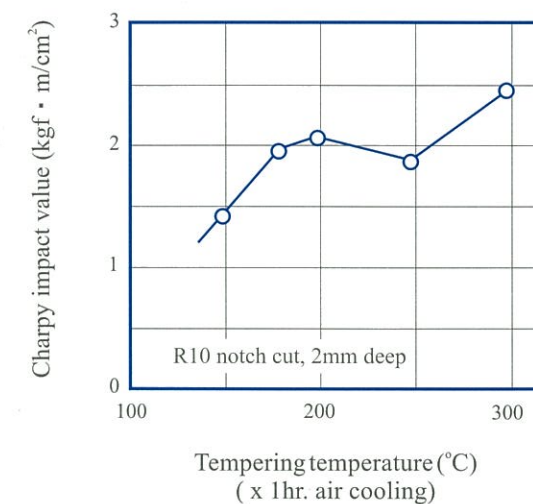
### ● Tempering Hardness Curve



### ● Distortion by Heat Treatment



### ● Impact Resistance



### ● Wear Resistance

