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Notes about safety:
Steel is heavy. Please execute the safety measures to prevent falling or collapse of cargo or sandwiched during transportation or warehousing. Please ensure the safety of workers use the jigs and various protective equipment and follow the applicable laws and ministerial ordinance, ordinances, guidelines, etc. when sawing, cutting, heat treatment, polishing or when using as mould, machine parts, or tooling.

Catalog No. HL-Y76 (E)

Promotional material

Pre-hardened die steel with high hardness

SLD®-f

We supply pre-hardened die material with **60HRC class**, which can be directly processed die-sinking.

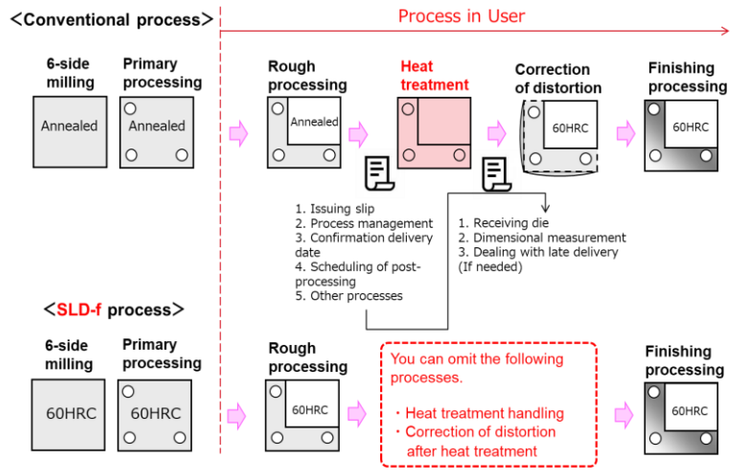
Advantages for users:

- To eliminate heat treatment
- To reduce lead time of die production
- To stabilize heat treatment quality

Omission of complicated heat treatment handling

Conventional processes require heat treatment, and various paperwork due to outsourcing.

SLD-f can omit heat treatment process itself and complicated handling.

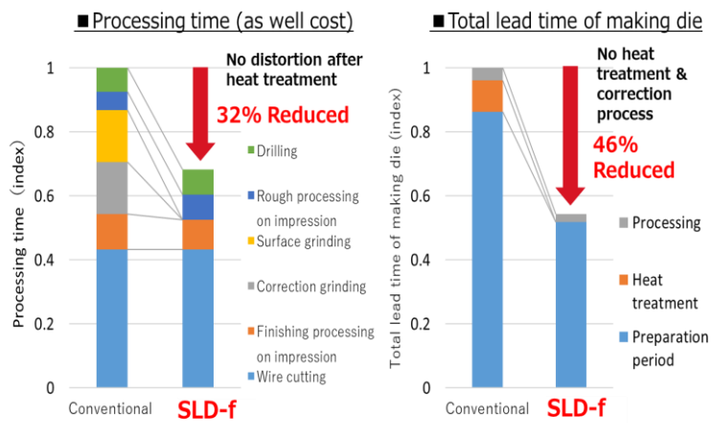


Reduction of total lead time for die making

SLD-f eliminates the conventional process for correction of distortion after heat treatment, and as a result, the die production lead time can be shortened. Furthermore, one-stop centralized management of dies is possible.

*We can suggest recommended cutting condition and tools for SLD-F.

[An example of die making] Size: 390mmx150mm×130mm, Quantity: about 50kg



Stabilization of heat treatment quality

・As a material supplier, we will provide die steel with better heat treatment quality through our heat treat management.
・It is also possible for SLD-f to suppress problems such as distortion during wire cutting and dimensional changes due to PVD.

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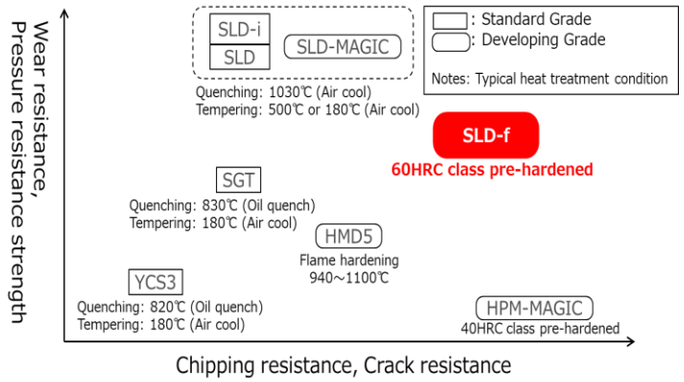
Pre-hardened die steel with high hardness

SLD®-f

Characteristics of YSS cold work tool steels

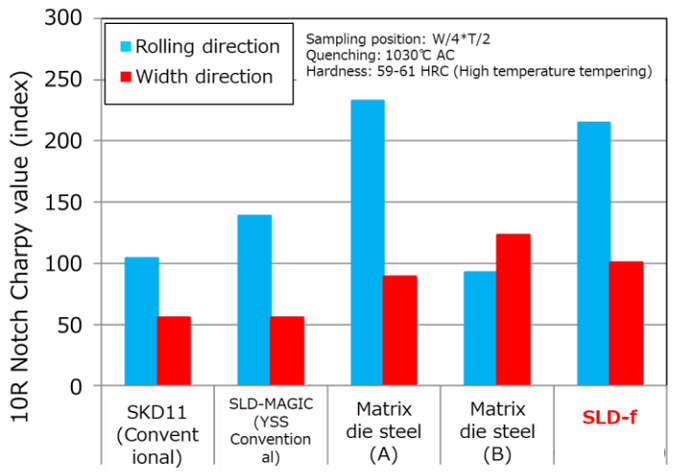
SLD-f has better toughness than the conventional material (D2, SKD11).

SLD-f is 60HRC pre-hardened steel, which contributes to the reduction of die production lead time, stability in heat treatment, and stabilization of die life.



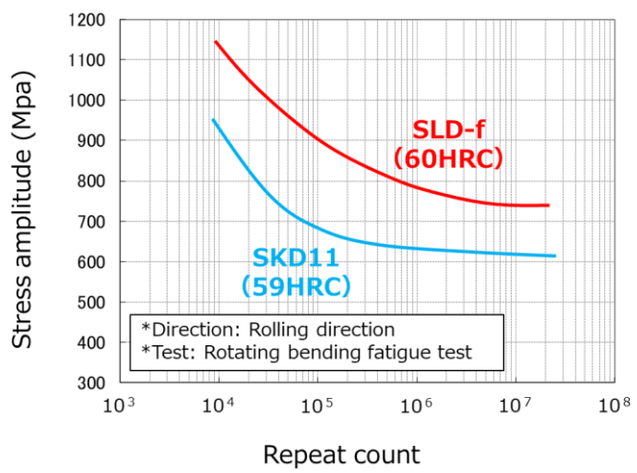
Toughness

SLD-f has toughness equivalent to or better than matrix die steel.



Fatigue strength

SLD-f has higher fatigue limit than conventional material (D2, SKD11), since it has few coarse primary carbides.



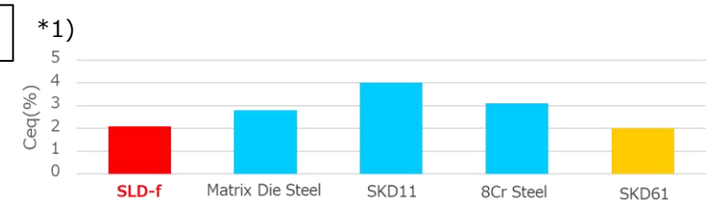
Weldability

The weldability is equivalent to matrix die steel or 8Cr steel.

*1)
equivalent carbon content (Ceq、JIS、WES)
Ceq(%) = +Mn/6+Si/24+Ni/40
+Cr/5+Mo/4+V/4 (%)

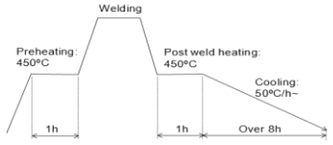
In general, the more equivalent carbon content increases, the more heat-affected zone is hardened. As a result, it may occur the low temperature cracking.

*1)



【Examples】

Welding method	TIG Welding	Shielded Metal Arc Welding
Welding Rod	SKD61	DF3B-600-B
Size	Φ3.2mm	
Flow Rate	14l/min	-
Current	100A	
Layer	3 layer	
Surface	Machining	
TP Size	200Lx90Wx20T(mm)	



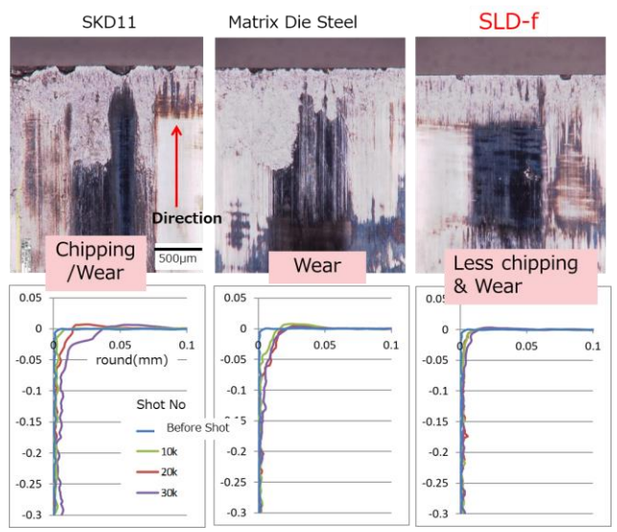
Application Examples

SLD-f shows less chipping and cracking when wear resistance test.

Picture

Test sample of ejector punch

item	
Work	780MPa -1.4mmt
Machine	80T press
Velocity	70 shot/min
Panch	Ejector Panch (Test sample, 60HRC) Φ8mm
Die	Button Die (SKH40,66HRC) Clearance : 10%



Physical Properties

Heat treatment condition of SLD-f pre-hardened is almost same as the condition of high temperature tempering SKD11.

It is available to do the nitriding, PVD coating for avoiding dimensional change.

・Tensile Strength : 2,250 MPa
・0.2% Yield strength : 1,850 MPa
・Density : 7.71

Thermal Expansion Coef.(×10⁻⁶/℃) Average value from 20℃ to each temp.	200℃	400℃
SLD-f	11.9	12.7
SKD11	11.2	12.0

Thermal Conductivity (W/(m・K))	20℃	200℃	400℃
SLD-f	20.9	24.5	26.5
SKD11	20.6	25.0	27.8

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