MAST

Takeuchi Die & Material Co.,Ltd.

HARDEN PLATE

Precision mold parts
manufacturer in Japan

JAPAN MAST BRAND

THERE IS NO BETTER CHOICE.

MADE IN JAPAN!!

MAST PRECISION PRODUCTS , YOUR BRAND OF TRUST !!

JAPANESE MATERIAL

JAPANESE INFRASTRUCTURE

JAPANESE TECHNOLOGY

MAST IS A MAKER OF STANDARD PRECISION DIE PARTS.

MAST HARDEN PLATE

Suggestion of a new manufacturing method

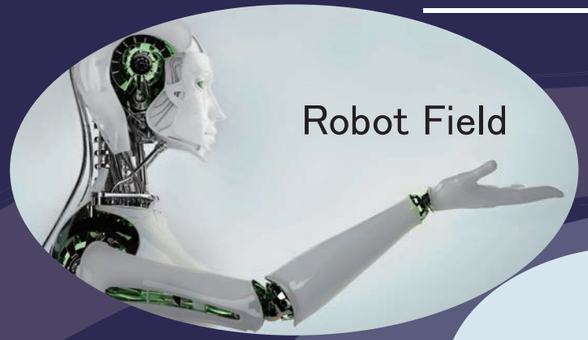
THIN!!

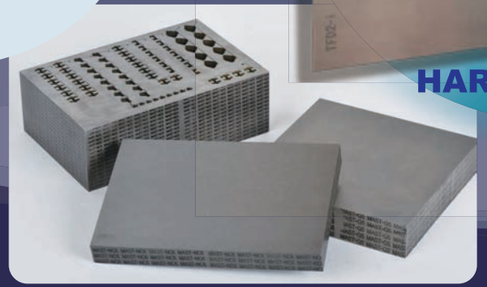
HARD!!

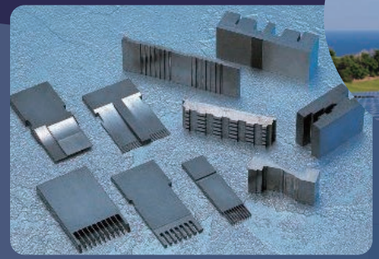
Cutting it by wire-cut electric discharge machining.

1. High quality special steel produced by Hitachi Metals (via Isotope method) is used.
2. Each steel grade has been heat-treated (quenched and tempered) to optimize its properties.
3. Both top and bottom sides have been grinded, hence immediate fabrication (WEDM etc.) is possible.
4. Items name and fiber direction are clearly labeled.
5. We can respond to various needs with abundant variations of 400 kinds of all 14 steel types.

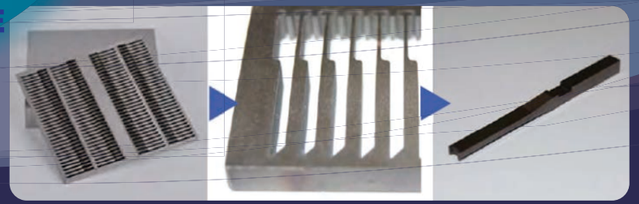
Usage Examples of MAST HARDEN PLATE

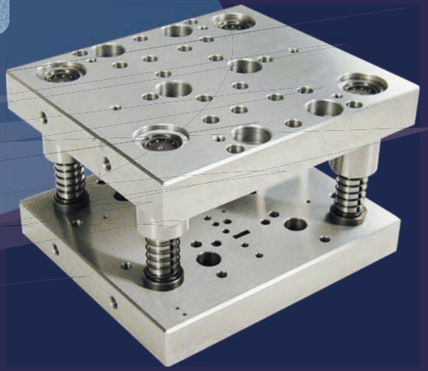






Punches Dies field





TFD2-i Harden Plate

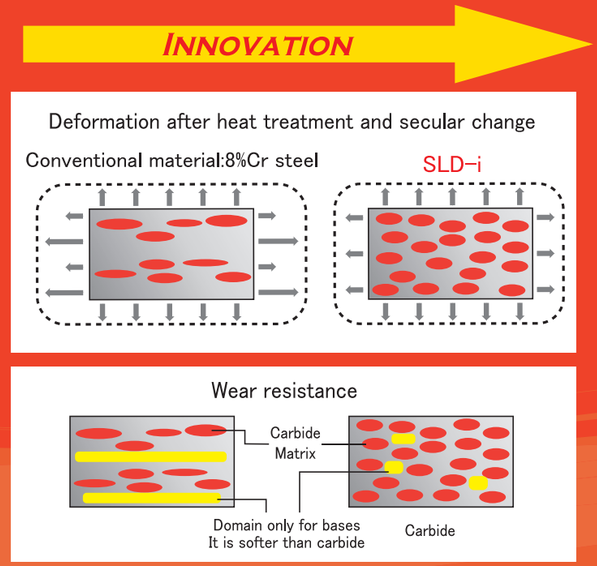
SLD-i (DIN1.2379 / AISI D2)

We call a HARDEN PLATE made by SLD-i steel「TFD2-i」.

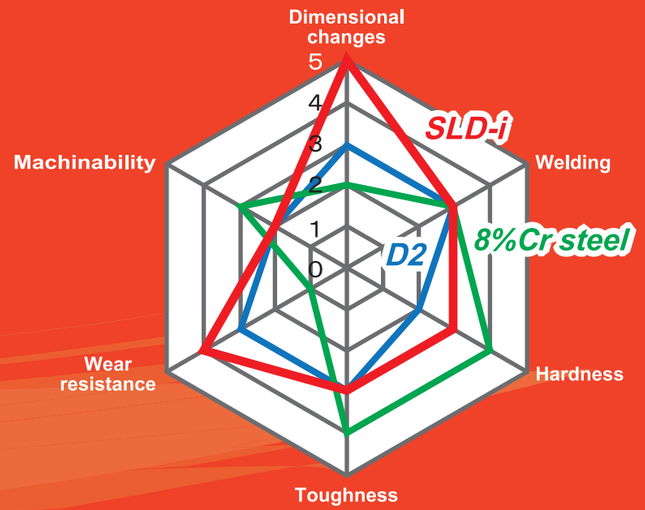
60HRC GRINDED

MAST has new product「SLD-i」New Cold Work Die Steel by Hitachi Metals.
New yet better value of unity:「SLD-i」and MAST.
We have heated and grinded SLD-i with smaller deformation and better abrasion resistance.
We offer you prompt delivery from its abundant stock.
Try once, and you will see the quality of SLD-i, its usability, and the creation of their synergy.

Characteristic of SLD-i



Pattern diagram of heat treatment dimensional change



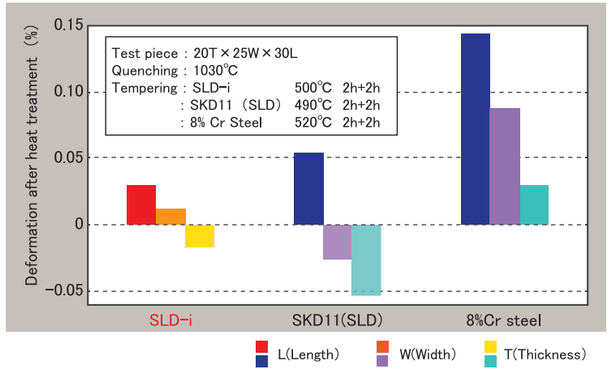
Cobweb chart

SLD-i (DIN1.2379 / AISI D2)

Characteristic of SLD-i

Deformation after heat treatment

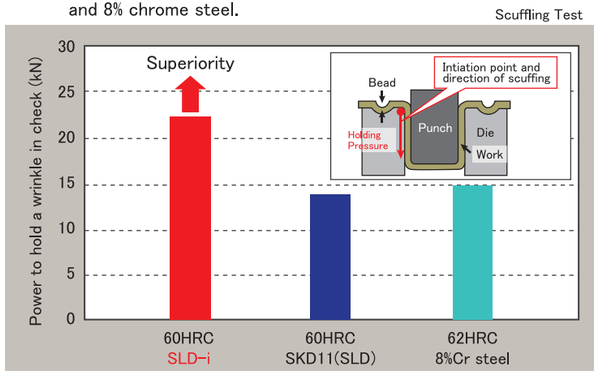
SLD-i is small, dense, and homogeneous carbide distribution achieved isotropy and less deformation after heat treatment.



*Excerpted from Hitachi Metals SLD-i official catalog

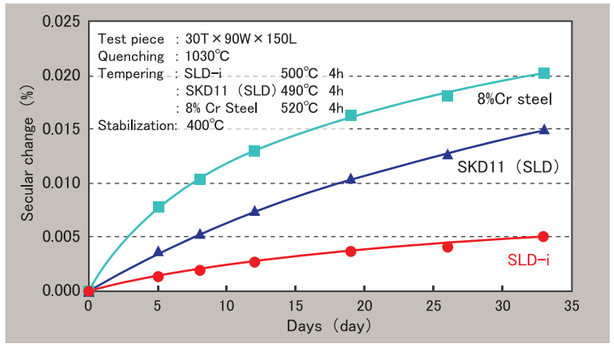
Scuffling resistance

SLD-i has superior scuffing resistance to SKD 11 (SLD) and 8% chrome steel.



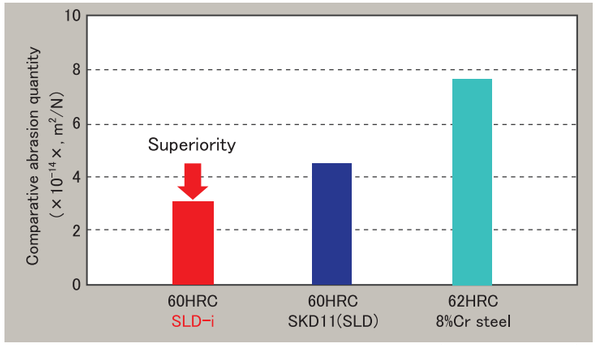
Secular change

SLD-i is small, dense, and homogeneous carbide distribution achieved less secular change.



Wear resistance

SLD-i has superior galling resistance to SKD11 (SLD) and 8% chrome steel.



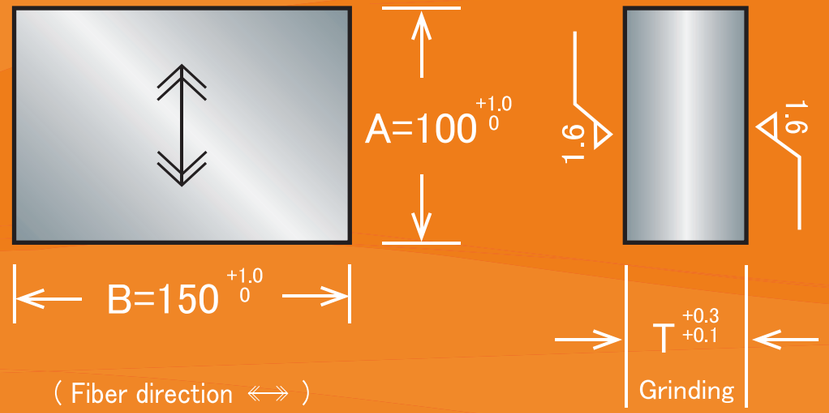
Pin-on-disk grinding test (ASTM G99-05)

<Attention> The characteristics,photos,charts,rankings and evaluations of this catalog are representative value by our test data, it dose not guarantee the quality of the product. This catalog and its contents are subject to change without notice.

After 10 years of Research and Development, we succeeded with small, dense, and homogeneous carbide distribution.
Its component has more carbide than original SKD11(SLD) and complise with DIN 1.2379/ AISI D2.
Therefore, we achieved below:Less destortion after heat treatment, less secular change, and better galling resistance.
Also, reduced problems caused by lot to lot variation and more precise result for each product.

TFD2-i Harden Plate

Sub-zero treatment



* The above fiber direction is subject to 13 mm or less.

TOLERANCE and PLATE THICKNESS

T Tolerance	A.B Tolerance	T Flatness	
T +0.3 +0.1	A.B +1.0 0	1 ～ 1.5	0.20/100mm max.
		2 ～ 5	0.10/100mm max.
		6 ～ 8	0.05/100mm max.
		9 ～ 13	0.03/100mm max.

T=

1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0
●	●	●	●	●	●	●	●	●	●	●

9.0	10.0	12.0	13.0	15.0	18.0	20.0	23.0	25.0	28.0	30.0
●	●	●	●	●	●	●	●	●	●	●

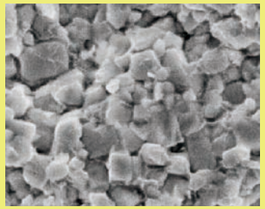
MAST TUNGSTEN CARBIDE PLATE

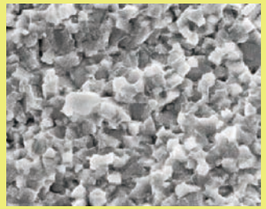
The concept is better quality and more strengthed result that worked on cobalt bonding layers.

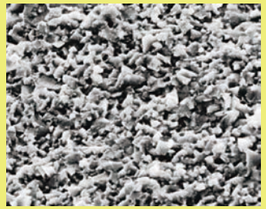
G5 / NC6 / FZ15 / FB10

Grde	CIS class letter	Mechanical properties						Chemical composition			grain size	Classification
		Hardness	Transverse rupture stregth	Compressive stregth	Young s modulus	Thermal coductivity	Fracture toughness	Co	WC	Other added elements		
		HRA	GPa	GPa	GPa	w/m・k	MPa√m	wt. %	wt. %	wt. %	μm	
G5	VM-50	88.5	3.4	4.5	560	67	15.4	11 ～ 13	Bal.	None	1.5 ～ 2.5	V40
NC6	VM-30	91.0	3.5	5.4	580	85	11.3	9 ～ 11	Bal.	0 ～ 1	1.0 ～ 1.2	V30
FZ15	VF-30	91.8	3.6	6.6	570	63	11.5	9 ～ 11	Bal.	0 ～ 1	0.7 ～ 0.9	Ultrafine particles
FB10	VF-10	93.5	3.1	6.9	550	63	9.5	11 ～ 13	Bal.	1.0 ～ 2.0	0.5 ～ 0.7	Ultrafine particles

Micro structure

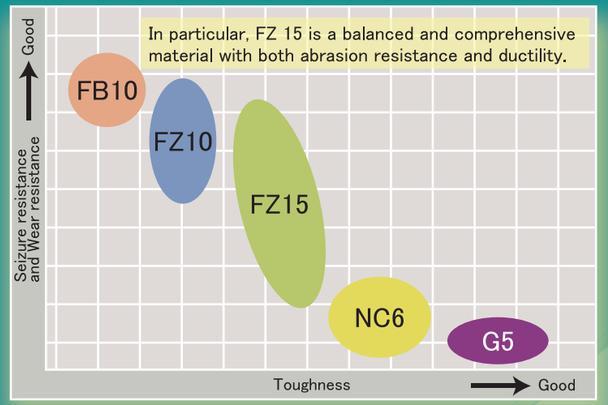

▲G5(Fine particles 1.5-2.5 μm)


▲NC6(Fine particles 1.0-1.2 μm)


▲FZ15(Submicron particles 0.7-0.9 μm)


▲FB10 (Ultrafine particles 0.5-0.7 μm)

MAST TUNGSTEN CARBIDE PLATE



General wear-resistant alloy (G5)

This is a general purpose material with very good wear resistance and toughness, and can be used for various tooling requirement

NC alloy (NC6)

The purpose of this material is to reduse damage caused by WEDM process.
This grade is medium grain carbide with WC grain size 1.0 – 1.2 μm.

FZ series(FZ15) fine grain

The feature of this grade of material is its fine grain of WC which ranges between 0.7 to 0.9 μm.
It has excellent wear resistance and toughness.

FB series(FB10) micro grain

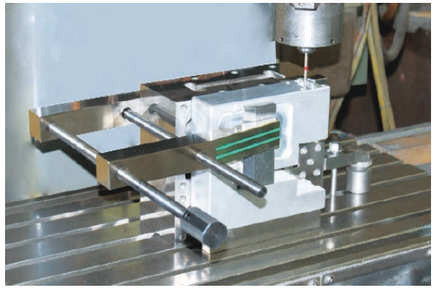
This grade is our micro grain carbide with Wcgrain size under 1 μm.
It has excellent hardness and transverse rapture strength,good for applications which requires sharper edges.

T : Dimensions of the plate thickness

Material	G5			NC6		FZ15	FB10
	150×60	150×100	150×125	150×60	150×100	150×60	150×60
0.5	●	—	—	—	—	—	—
1.0	●	—	—	●	—	●	●
1.5	●	—	—	●	—	●	●
2.0	●	—	—	●	—	●	●
2.5	●	—	—	●	—	●	●
3.0	●	●	—	●	●	●	●
3.5	●	—	—	●	—	●	●
4.0	●	●	—	●	—	●	●
4.5	●	—	—	●	—	●	●
5.0	●	●	●	●	●	●	●
6.0	●	●	—	●	—	●	●
7.0	●	●	—	●	—	●	●
8.0	●	●	●	●	●	●	●
9.0	●	—	—	●	—	●	●
10.0	●	●	●	●	●	●	●
13.0	—	●	●	●	●	●	●
16.0	—	●	●	—	●	●	●
20.0	—	●	●	—	●	●	●
25.0	—	●	●	—	●	●	●
40.0	—	●	—	—	●	—	—
50.0	—	●	●	—	●	—	—
60.0	—	●	—	—	●	—	—

MAST PRECISION SQUARE & JIG SERIES

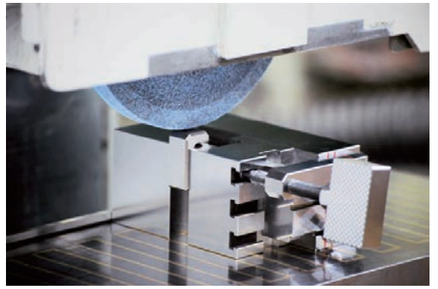
Practice of MAST fixture (right angle drawing process)

① 

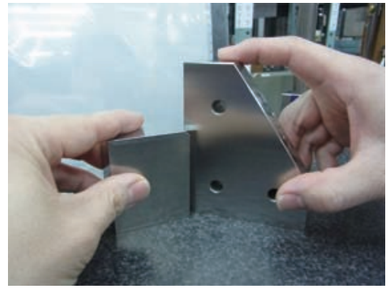
Fix workpiece on the block with "MAST PRECISION CLAMP"

② 

Use "MAST STRAIGHT EDGE" to check whether the block and the workpiece are fixed in parallel without misalignment.

③ 

Grinding

④ 

Use "MAST PRECISION SQUARE" to measure the right angle.

MAST PRECISION CLAMP

MAST PRECISIOM CLAMP is esigned to be scratch-resistant even for clamping hard-to-cut materials.

MAST STRAIHT EDGE

MAST STRAIGHT EDGE is removable with a handle.Ideal for measuring thin objects and large plates.Full-length accuracy 2 μm or less.

MAST PRECISION SQUARE

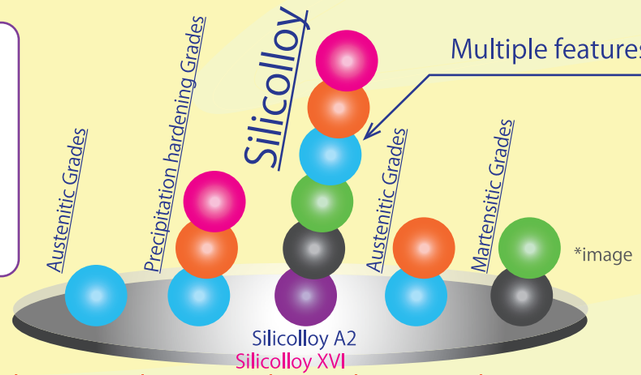
MAST PRECISION SQUARE has a stable shape. It can be used in vertical / horizontal plane. Precise R processing on two vertical ridgelines. Accuracy 1 μm or less

SILICOLLOY®

Precipitation Hardened Stainless Steel

The new stainless steel which has corrosion resistance and hardness

- Higher Strength
- Heat Resistance
- Corrosion Resistance
- Wear Resistance
- Higher Hardness
- Seizure Resistance

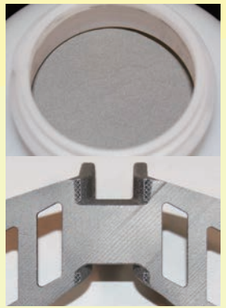


AISI	304	S17400		310S	440C
BS	304S31			310S31	
NF	Z7CN18-09	Z6CNU17-04		Z8CN25-20	Z100CD17
DIN	X5CrNi18-10				
EN	1.4301	1.4542		1.4541	1.4125
JIS	SUS304	SUS630		SUS310S	SUS440C

New **3D modeling**

Silicolloy Metal Powder

for Selective laser sintering



Material : Silicolloy A2 & Silicolloy XVI

Strength & Hardness of steel was used to be realized by the feature of "carbon", but "silicon" affects in case of Silicolloy.
For the reason above, silicolloy become dream new materials with multiple features which couldn't bring about from old idea.

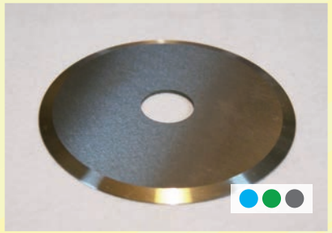
http://www.silicolloy.co.jp/

Salt spray test (After 240 hours)

	Austenitic Grades		Precipitation hardening Grades			Martensitic Grades	
The brand name				Silicolloy XVI	Marageing steel		
AISI	304	316L	S17400			420	440C
BS	304S31	316S11				420S37	
NF	Z7CN18-09	Z3CND17-12-02	Z6CNU17-04			Z33C13	Z100CD17
DIN	X5CrNi18-10	X2CrNiMo17 13 2				X30Cr13	
JIS	SUS304	SUS316L	SUS630			SUS420J2	SUS440C
EN	1.4301	1.4404	1.4542			1.4028	1.4125
HV	HV200	HV200	HV480	HV660	HV580	HV620	HV700
HRC			HRC45	HRC57	HRC52	HRC55	HRC58

● Precision plate

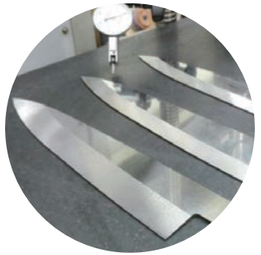
Mold for medicine manufacture , Knife for food & Plate for glass bottle manufacture



Material : Silicolloy A2 & Silicolloy XVI

Ultra Precision Kitchen Knife

The new stainless steel which has corrosion resistance and hardness



SILICOLLOY® XVI

Japan's original materials

World's first stainless steel with containing a lot of silicon
Universal type stainless steel
with High strength · Corrosion resistance · Heat resistance ·
Abrasion resistance· Abrasion resistance and High hardness.

BLADE

57HRC

Flatness：0.01㎜/100㎜

Core of Handle

INOX steel, ultra low carbon steel and SUS316L
Excellent corrosion (pitting corrosion) resistance
to seawater and others.

Peripheral of Hadle

G10

A material knitted with glass fiber impregnated
with epoxy resin and cured by high temperature
and high pressure

TAKEUCHI DIE & MATERIAL CO.,LTD.

Precision mold parts manufacturer in Japan

- Trusted brand
- Japanese precision mold parts manufacture
- Factory in Japan
- Selected material
- Japanese technology & systems
- Japan's spirit & sincerity

Chosen brand of Japan

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