

MATERIAL FOR TOOLING

Selection of tool material (Type of material) is very important in terms of the quality of the processed product and the tool life (processing cost).

This time, we summarized the typical material for tooling.

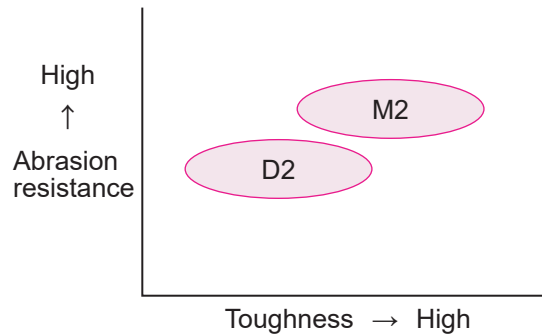
MATERIAL OF PUNCH

We use the following material for punch body.

D2 (SKD)

M2 (SKH)

Fig.1 Material properties of the punch



Characteristics of each steel

D2 (SKD)

It is a typical tool steel for sheet metal processing which is excellent in mechanical properties and heat treatment characteristics.

We adopt **Super-subzero treatment** to further improve wear resistance.

M2(SKH)

It is one of the most widely used materials among M2.

Compared to D2, it is a material excellent in abrasion resistance, impact resistance and toughness. It is suitable materials such as stainless steel and a large amount production.

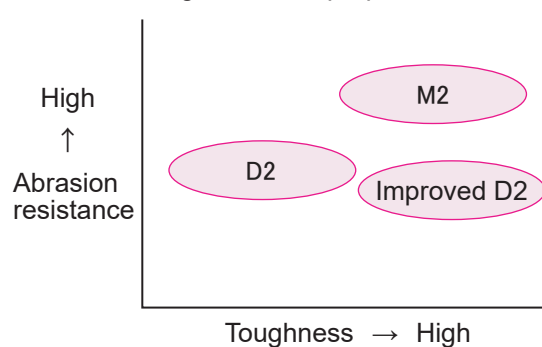
MATERIAL OF DIE

We use the following material for die.

Improved D2

M2 (SKH)

Fig.2 Material properties of the Die



Characteristics of steel

Improved D2

A material with improved toughness and chipping resistance by refining carbides. It has toughness equal to or higher than that of M2.

MATERIAL FOR TOOLING

HOW TO SELECT MATERIAL

Selection of the material of the tool is done by processing conditions (such as the material of sheet metal, the number of hits and the accuracy of product).

The guides of selection are as follows.

GUIDE FOR SELECTING D2	GUIDE FOR SELECTING M2
<ul style="list-style-type: none">• Small production• Punching cold roll and aluminum• Punching the thin sheet• There is a possibility of design change (shape change).• Low price (As a result, high-speed steel may be cheaper.)	<ul style="list-style-type: none">• Large production• Punching stainless steel• Punching the thick sheet• In combination with the coating process• Consider about dimensional change due to wear.• In the case of D2, the edge strength is insufficient. (When chipping or breakage occurs due to lack of strength.)

In case of large number of production or difficult-working materials, it is recommended to use in combination with **super-dry punch** or coating process tools.

Not only the insufficient strength of the tool but also other factors (such as slug pulling, misalignment of the turret, insufficient mounting of the tool, etc.) can be considered as the cause of the breakage of the tool.

We recommend that you select the material after carefully investigating the cause of the damage.

(See our Technical Guidance “Vol.2 Life countermeasure for tooling” for more detail about SDP.)

OTHER MATERIAL FOR TOOLING

CARBON STEELS FOR MACHINE STRUCTURAL MATERIAL.

It is one of the representative steel types of metal materials.

In the tool, it is used for part that is not processed directly on the material.

(Tool head, retainer collar etc.)

CHROMIUM MOLYBDENUM STEEL (SCM)

It is used for parts that require middle strength. (Guide, ejector of forming tool etc.)

CARBON TOOL STEEL (SK)

It is used for parts that require relatively high hardness. (Key-pin, ejector of forming tool etc.)

ALLOY TOOL STEEL (SKS)

Used for a part this needs equal hardness as D2 steel. (Pin holder etc.)

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