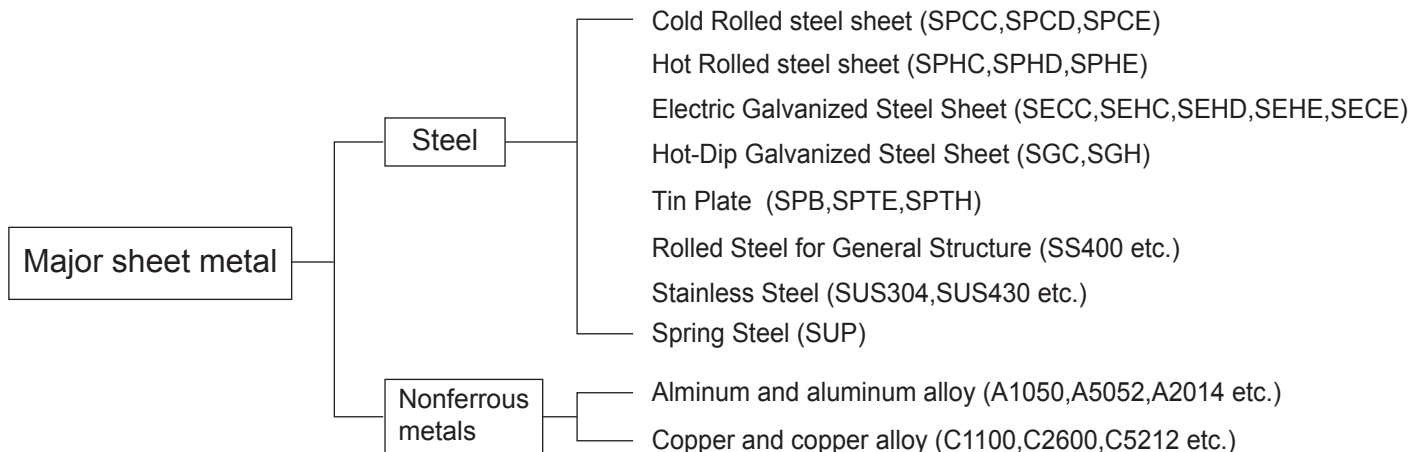


MATERIAL PROPERTIES (STEEL)

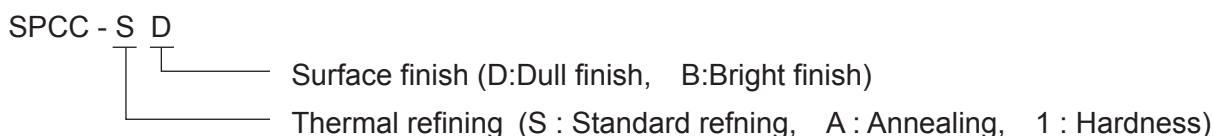
In the turret punch press, various materials (workpieces) are processed. The materials used for sheet metal processing are various, such as steel and nonferrous metals, and the names also differ according to each maker. This time, we summarized the typical **steel materials** for metal forming.

TYPICAL METAL FORMING MATERIALS



COLD ROLLED STEEL SHEET

It is a typical steel material of sheet metal material rolled at near normal temperature. It is inexpensive in price and good in processability, and it is a plate material whose surface is clean because it is rolling at normal temperature. Usually SPCC (for general use) is often used, but if problems occur with forming, we recommend SPCD (for forming) and SPCE (for deep forming).



HOT ROLLED STEEL SHEET

It is a material rolled at high temperature and has plate thickness of 1.2 ~ (14)mm. Because of hot rolling, scales are attached to the surface of the plate. There are also steel plates that have been removed scales by acid cleaning or shot blasting. It is recommended to take a slightly wider clearance than the Cold Rolled Steel.

Material	JIS symbol	Thickness mm	Remark	Tensile Strength N/mm ²	Elongation %
Cold Rolled Steel	SPCC	0.4 - 3.2	General	(Over 270)	(Over 32 - 39)
	SPCD	0.4 - 3.2	For Emboss	Over 270	Over 35 - 41
	SPCE	0.4 - 3.2	For Deep Emboss	Over 270	Over 36 - 43
Hot Rolled Steel	SPHC	1.2 - 14	General	Over 270	Over 27 - 31
	SPHD	1.2 - 14	For Emboss	Over 270	Over 30 - 39
	SPHE	1.2 - 6	For Deep Emboss	Over 270	Over 31 - 41

<Reference> 1² N/mm² ≒ 0.102kgf/mm²

MATERIAL PROPERTIES (STEEL)

ELECTRIC GALVANIZED STEEL SHEET

Electrogalvanized on cold-rolled steel sheet and hot-rolled steel sheet raw material, widely used for home appliances, automotive parts, etc.

SYMBOL OF ELECTRIC GALVANIZED STEEL SHEET

Material	Thickness	Remark	Symbol	Original Sheet
Cold Rolled Steel	0.4 - 3.2	General	SECC	SPCC
		For Emboss	SECD	SPCD
		For Deep Emboss	SECE	SPCE
Hot Rolled Steel	1.6 - 4.5	General	SEHC	SPHC
		For Emboss	SEHD	SPHD
		For Deep Emboss	SEHE	SPHE

HOT-DIP GALVANIZED STEEL SHEET

Hot-dip galvanized steel sheet is a material obtained by hot-dip galvanizing plating of cold-rolled steel sheet or hot-rolled mild steel plate, has high corrosion resistance due to thick plating layer, and is used for exterior building materials and outdoor equipment.

ADVICE ON ONE POINT

When punching a plated steel sheet, the plating may peel off and enter the inside of the tool (sliding part), which may cause seizure. It is advisable to carry out maintenance earlier and remove the plating powder. In addition, since welding of the cutting edge is likely to occur, coating treatment is recommended.

STAINLESS STEEL

Stainless steel is excellent in corrosion resistance, it is hard to rust and it is used for many industrial products. However, there are disadvantages such as hard processability and high price compared to SPCC and SECC.

Symbol	Tensile Strength N/mm ²	Elongation %	Note
SUS304	Over 520	Over 40	Austenite
SUS430	Over 450	Over 22	Ferrite

ADVICE ON ONE POINT

Because stainless steel has hard processability, we recommend using a long-life super dry punch without processing oil in punching. We also recommend coating the punch for forming tooling such as burring.

Knowing the material and characteristics of the material (workpiece), making appropriate selection of tool (material, coating etc.), processing conditions (clearance etc.) will lead to improve the quality of the product and reduction of cost.

For the clearance of each material, please refer to "FOR CLEARANCE OF THE CUTTING DIE (Vol.6)".

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