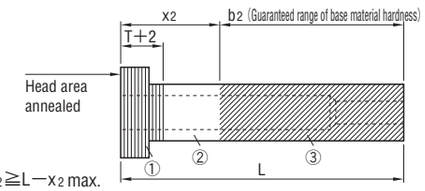
〔PRODUCT DATA〕

GUARANTEED RANGE OF HARDNESS OF THE EJECTOR SLEEVE AND CENTER PIN BASE MATERIAL

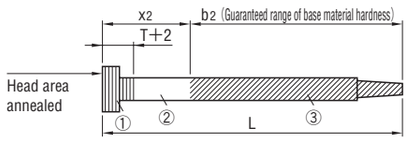
■Guaranteed Range of Hardness of the Ejector Sleeve and Center Pin Base Material

Straight Ejector Sleeve



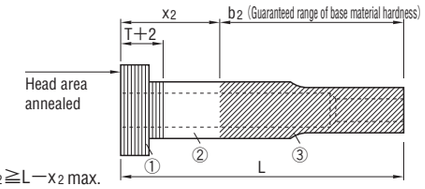
$b_2 \geqq L - x_2$ max.

Center Pin



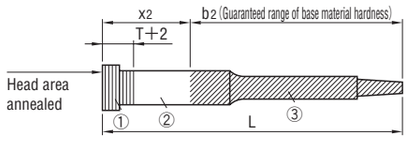
$b_2 \geqq L - x_2$ max.

Stepped Ejector Sleeve



$b_2 \geqq L - x_2$ max.

Stepped Center Pin



$b_2 \geqq L - x_2$ max.

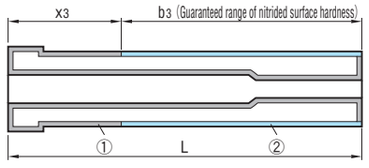
Classification	M	Head Thickness (T)	x_2 max.	Ejector Sleeve・Center Pin Material Hardness ①	②	③ Guaranteed range of base material hardness
Ejector sleeves	SKH51	T4 (4mm) JIS (6・8mm)	0	58～60HRC Overall quenching (no annealing)	58～60HRC Overall quenching (no annealing)	58～60HRC
Center pins	SKH51	T4 (4mm)	30	28～35HRC (reference value)	28～60HRC (reference value)	58～60HRC
		JIS (4・6・8mm)	35			
	SKD61	T4 (4mm)	30	28～45HRC (reference value)	28～55HRC (reference value)	50～55HRC
	SKD61 ＋ Nitriding	T4 (4mm)	30	28～45HRC (reference value)	28～45HRC (reference value)	40～45HRC
		JIS (4・6・8mm)	35			
		T10 (10mm)	40			
Ejector sleeves	SKD61 ＋ Nitriding	T4 (4mm) ECB・ECBB	0	37～43HRC (no annealing)	37～43HRC (no annealing)	37～43HRC
		T4 (4mm)	30	28～43HRC (reference value)	28～43HRC (reference value)	37～43HRC
		JIS (4・6・8mm)	35			
		T10 (10mm)	40			

● Annealing was performed on the heads of SKH51 and SKD61 to achieve a level of 30HRC. Annealing was performed on the heads of SKD61＋Nitriding to achieve a level of 40HRC.

■Guaranteed Range of Ejector Sleeve and Center Pin Nitriding and Surface Hardness

Straight Ejector Sleeve

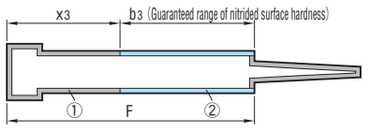
※Cross-sectional view



$b_3 \geqq L - x_3$ max.

Center Pin

※Cross-sectional view



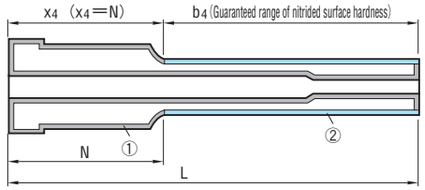
$b_3 \geqq F - x_3$ max.

〔PRODUCT DATA〕

GUARANTEED RANGE AND HARDNESS OF NITRIDING AND SURFACE HARDNESS

Stepped Ejector Sleeves

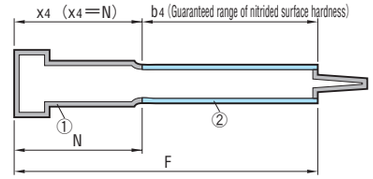
※Cross-sectional view



$b_4 \geqq L - x_4$ ($x_4 = N$)

Stepped Center Pins

※Cross-sectional view



$b_4 \geqq F - x_4$ ($x_4 = N$)

M	Head Thickness (T)	x_3 max.	Ejector Sleeve・Center Pin Surface Hardness ①	② (Guaranteed range of nitrided surface hardness)
SKD61 ＋ Nitriding	T4 (4mm) ECB・ECBB	10	Base material hardness (without nitrided layer) ～ 900HV～ (with nitrided layer)	900HV～
	T4 (4mm)	30		
	JIS (4・6・8mm)	35		
	T10 (10mm)	40		

●Nitriding

Nitriding is one of the steel surface treatment methods.
The steel is placed in a furnace that is then filled with nitrogen gas, and at high temperatures (around 500℃) a hardened layer combined with the nitrogen is formed on the surface of the steel.

●Nitrided Depth

This refers to the depth of the hardened layer formed on the surface of the steel by nitriding treatment.
The nitrided depth of MISUMI's 900HV～ plastic mold ejector sleeves/center pins is 0.003～0.008 mm (reference value), and the depth of the hardened layer is 0.1 mm deeper (reference value) than the surface.
The nitrided depth of straight ejector sleeves and center pins is controlled by adjusting nitriding temperature and treatment time in accordance with shaft diameter size.
In the case of stepped ejector sleeves and center pins, nitrided depth is controlled by adjusting nitriding temperature and treatment time in accordance with tip diameter (P) size.
For this reason, the surface hardness of the shaft diameter (D) area is slightly lower at around 500HV (reference value).

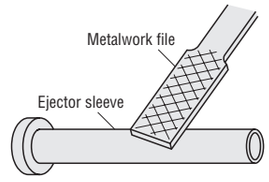
●Ejector Sleeves

The guaranteed range of nitrided surface hardness for ejector sleeves (b_3, b_4) only applies to the outer diameter surface.
The inner diameter surface is outside the guaranteed range of nitrided surface hardness.

●Center Pins

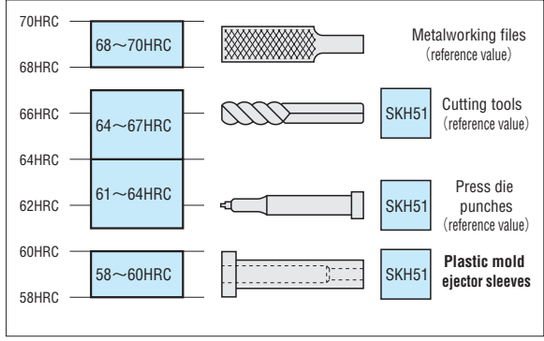
Nitriding has not been done on the tip section of the center pins, in order to prevent chipping.

■Ejector Sleeve・Center Pin Hardness



Normally, it is quite easy to file down an ejector sleeve・center pin using a regular file (metalworking file).
With the SKD61＋Nitriding ejector sleeve/center pin, however, the nitriding treatment makes it difficult to file down, because the file does not bite as easily into the surface. The nitrided layer is several microns thick, so a little pressure should be applied to the file.
※Most regular metalworking files have a hardness of 68 to 70HRC.

M SKH51 (JIS high-speed steel)



M SKD61 (JIS die steel) prehardened, and nitrided