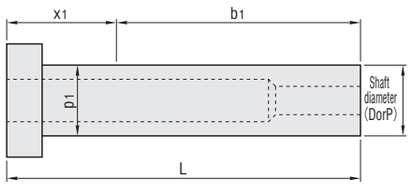
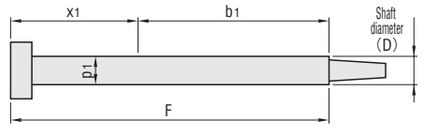
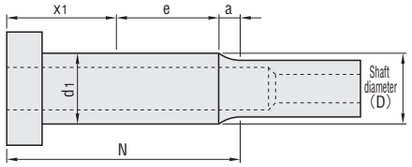
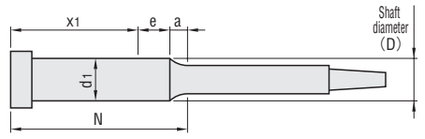
〔PRODUCT DATA〕
GUARANTEED RANGE OF SHAFT-DIAMETER PRECISION FOR EJECTOR SLEEVES AND CENTER PINS

■Guaranteed Range of Shaft-Diameter Precision for Ejector Sleeves

	Straight Ejector Sleeve	Center Pin—Shaft Diameter (D) Selection Type—
Shaft diameter (DorP) Guaranteed precision range Length (b_1)	 $b_1 \geqq L - x_1$ max.	 $b_1 \geqq F - x_1$ max. or $b_1 \geqq L$ − (tip length) $- x_1$ max. For the shaft diameter (P) designation types, refer to the explanation below.
Shaft diameter (D) Guaranteed precision range Length (e)	**Stepped Ejector Sleeve**	**Stepped Center Pin**
	 $e \geqq N - 5 - x_1$ max.$-a-3$ ＊a：Length of step R section ＊5：Tolerance of length of N ＊3：Tolerance of step R section length	 $e \geqq N - 5 - x_1$ max.$-a-3$ ＊a：Length of step R section ＊5：Tolerance of length of N ＊3：Tolerance of step R section length

M	Head Thickness (T)	x_1 max.
SKH51	T4 (4mm)	30＊ (This does not apply to the shaft diameter (P) designation type center pins. Refer to the explanation below for details.)
	JIS (4·6·8mm)	35
SKD61	T4 (4mm)	30
SKD61 ＋ Nitriding	T4 (4mm) ECB, ECBB	10
	T4 (4mm)	30
	JIS (4·6·8mm)	35
	T10 (10mm)	40

＊When L20.00～39.99 is x_1 max.＝10

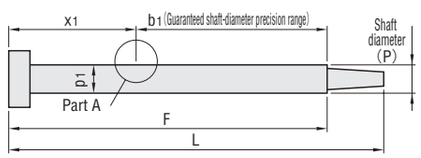
●Straight Ejector Sleeves
●Center Pins

T (DorP)	p_1 Precision
(DorP) $^{0}_{-0.005}$	$p_1 = (DorP)^{0}_{-0.1}$
(DorP) $^{-0.01}_{-0.02}$	$p_1 = (DorP)^{-0.01}_{-0.1}$
(DorP) $^{-0.01}_{-0.03}$	

●Stepped Ejector Sleeves
●Stepped Center Pins

T (D)	d_1 Precision
D $^{0}_{-0.005}$	$d_1 = D^{0}_{-0.1}$
D $^{0}_{-0.02}$	$d_1 = D^{0}_{-0.1}$
D $^{-0.01}_{-0.02}$	$d_1 = D^{-0.01}_{-0.1}$
D $^{-0.02}_{-0.04}$	$d_1 = D^{-0.02}_{-0.1}$

■Center Pins —Shaft diameter (P) designated type—

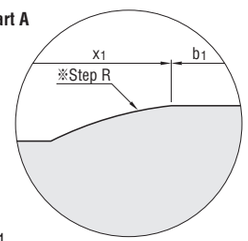


$b_1 \geqq F - x_1$

Misumi's center pin with relief enables to be designated in 0.01mm or 0.1mm increments of the shaft diameter (P), even with long length L.

The guaranteed range of shaft-diameter (P) precision is b_1, and the shaft-diameter area outside of this is relief processed.

●Detail of Part A

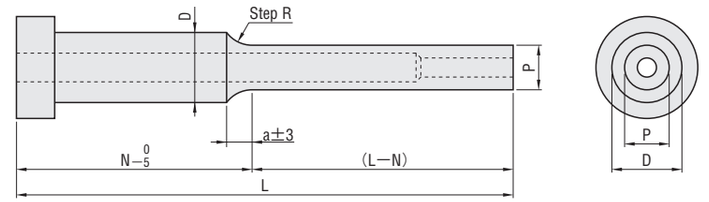


●When L≧200.01
As shown in the illustration, smooth step R processing is performed on the junction section between the shaft-diameter (P) area and the relief area.
※Size of step R: approximately 100R (reference value)

M	Head Thickness (T)	T (P)	p_1 Precision	x_1 max. L150.00 or less	L150.01 ～200.00	L200.01 ～250.00	L250.01 ～300.00	L300.01 ～350.00	L350.01 ～400.00	L400.01 ～450.00	L450.01 ～500.00
SKH51 (※P 0.01mm increments)	T4 (4mm)	P $^{0}_{-0.005}$	$p_1 = P^{0}_{-0.1}$	30	30	110	160	210	—	—	—
	JIS (4·6·8mm)			35	35						
	T4 (4mm)	P $^{-0.01}_{-0.02}$	$p_1 = P^{-0.01}_{-0.1}$	30	30						
	JIS (4·6·8mm)			35	35						
SKD61 (※P 0.01mm increments)	T4 (4mm)	P $^{0}_{-0.005}$	$p_1 = P^{0}_{-0.1}$	30	60	110	160	210	—	—	—
		P $^{-0.01}_{-0.02}$	$p_1 = P^{-0.01}_{-0.1}$								
SKD61＋Nitriding (※P 0.1mm increments)	T4 (4mm)	P $^{-0.01}_{-0.02}$ (P≦12.0)	$p_1 = P^{-0.01}_{-0.1}$	30	30	30	30	210	260	310	360
	JIS (4·6·8mm)	P $^{-0.01}_{-0.03}$ (P>12.0)		35	35	35	35				

〔PRODUCT DATA〕
STEP R AND CONCENTRICITY OF STEPPED EJECTOR SLEEVES AND STEPPED CENTER PINS

■Step R and Concentricity of Stepped Ejector Sleeves



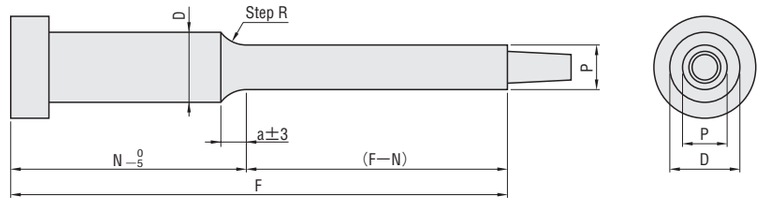
In order to ensure the effective dimensions of the length (L−N) of tip diameter (P), (L−N) is designed to be a plus tolerance and N is a minus tolerance. Step R is configured to form a smooth transition between the tip diameter (P) and the shaft diameter (D).

Size of step R: approximately R8 to 12.＊
＊The size of step R is determined by the size of the grindstone used to process it. This is not a guaranteed value for R.

Formula used for calculating the length (a) of step R: $a = \sqrt{\frac{D-P}{2} \times (2R - \frac{D-P}{2})}$

Concentricity of tip diameter (P) and shaft diameter (D): 0.2mm or less

■Step R and Concentricity of Stepped Center Pins



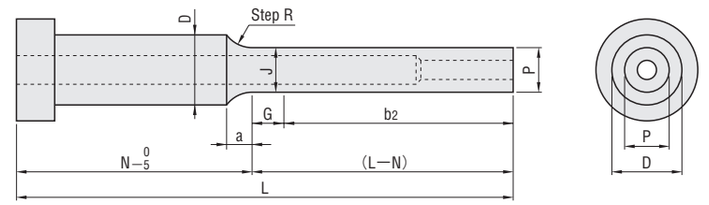
In order to ensure the effective dimensions of the length (F−N) of tip diameter (P), (F−N) is designed to be a plus tolerance and N is a minus tolerance. Step R is configured to form a smooth transition between the tip diameter (P) and the shaft diameter (D).

Size of step R: approximately R8 to 12.＊
＊The size of step R is determined by the size of the grindstone used to process it. This is not a guaranteed value for R.

Formula used for calculating the length (a) of step R: $a = \sqrt{\frac{D-P}{2} \times (2R - \frac{D-P}{2})}$

Concentricity of tip diameter (P) and shaft diameter (D): 0.2mm or less

■Guaranteed Range of Tip-Diameter Precision for Stepped Ejector Pins



b_2 = Guaranteed range of tip-diameter (P) Precision

M	b_2 Guaranteed precision range	(L−N)	G max.	(P) T	J T
SKH51	$b_2 \geqq (L-N) - G$max.	40.00 or less	3	P $^{0}_{-0.005}$	J $^{0}_{-0.03}$
		40.01～ 60.00	10		
		60.01～ 80.00	15		
		80.01～100.00	20		
		100.01～125.00	25		
SKD61＋Nitriding	$b_2 \geqq (L-N) - G$max.	40.00 or less	3	P $^{-0.01}_{-0.02}$	J $^{-0.01}_{-0.05}$
		40.01～ 60.00	10		
		60.01～ 80.00	15		
		80.01～100.00	20	P $^{-0.01}_{-0.03}$	
		100.01～125.00	25		
		125.01～	25		