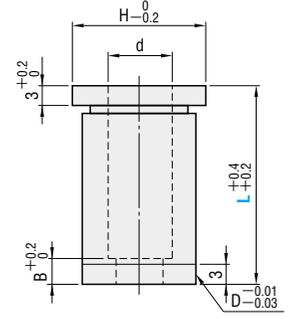
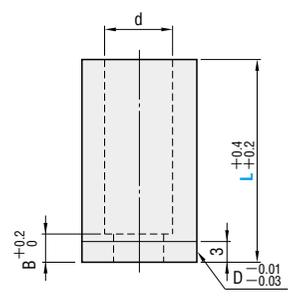


PUNCH GUIDE BUSHINGS

—Headed—		RoHS	Shank diameter D Tolerance	M H	D dimension	Catalog No.	
	D _{m5}	Equivalent to SKH51 61~64HRC Equivalent to SKD11 60~63HRC	D3~5	A	MHG	HGD HGR HGE HGG	
—Straight—		RoHS	Shank diameter D Tolerance	M H	D dimension	Catalog No.	
	D _{n5}	Equivalent to SKH51 61~64HRC Equivalent to SKD11 60~63HRC	D3~5	A	MSG	SGD SGR SGE SGG	

D tolerance		Catalog No.		L	0.01mm increments				B	d	H
D	Type	Type	D		A	D R E G	R	R			
3	(Equivalent to SKH51) Headed type (D _{m5}) Straight type (D _{n5}) A MHG MSG	(3)	10 13 16 20	0.30 ~ 0.70	—	—	—	—	2	2.0	4
4	—	(4)	10 13 16 20 22 25	0.30 ~ 2.00	—	—	—	—	2	2.4	5
5		(5)	10 13 16 20 22 25	0.50 ~ 2.50	—	—	—	—		2.9	6
6	(Equivalent to SKD11) Headed type (D _{m5}) (D ^{+0.005}) Straight type (D _{n5}) (D ^{+0.005}) A MHG A—MHG MSG A—MSG D HGD A—HGD SGD A—SGD R HGR A—HGR SGR A—SGR E HGE A—HGE SGE A—SGE G HGG A—HGG SGG A—SGG	(6)	10 13 16 20 22 25	1.00 ~ 3.00	3.00	1.00	—	—	3	3.4	9
8		8	10 13 16 20 22 25	1.00 ~ 4.00	4.00	1.00	—	—		4.4	11
10		10	10 13 16 20 22 25	2.00 ~ 6.00	6.00	1.20	—	—		6.4	13
13		13	10 13 16 20 22 25	3.00 ~ 8.00	8.00	1.50	—	—		8.4	16
16	16	10 13 16 20 22 25	3.00~10.00	10.00	2.00	—	—	6	10.6	19	

⊕ The D=(6) straight type is a specification available for shape (A) only. ⊕ D3 bushings are thin under the head. Be careful not to damage the bushings when mounting them.
⊕ D=(3), (4), and (5) are specifications available for m5 and n5 only.

Order  Catalog No. — L — P — W — R (R only)  Days to Ship **Quotation**

Price  **Quotation**

MHG 8 — 20 — P3.01
SGR 13 — 16 — P7.22 — W3.22 — R0.15

Alterations  Catalog No. — L(LC) — P(PC) — W(WC) — R — (HC-TC-KC, etc.)

MHG 8 — LC15 — P3.01 — R — KC

Alteration	Code	A	D R E G	1Code
Alterations to guide	PC	Guide diameter change min.: P > PC ≥ P _{min} ≥ 0.50 0.01mm increments ⊕ If PC is 1.50~1.99, then for D13, 16→ B=4. max.: P < PC ≤ P+0.2	Guide diameter change min.: P _{PC} > P _W > P _{min} ≥ 1.00 0.01mm increments max.: P _{PC} < P _W ≤ P _{max} + 0.2	1Code
	WC	Tip diameter tolerance change P+0.01 ⇔ +0.005 ⊕ Cannot be used for P < 1.00.	Tip diameter tolerance change P·W±0.01 ⇔ +0.01 0	
Alterations to full length	LC	Full length change (reduction in tip length) 10 ≤ L - (B-1) ≤ LC < L 0.1mm increments (If combined with LKC-LKZ, 0.01mm increments can be selected.) ⊕ B dimension and press-in lead are shortened by (L-LC). B ≥ 1	Full length change 10 ≤ L - (B-1) ≤ LC < L 0.1mm increments (If combined with LKC-LKZ, 0.01mm increments can be selected.)	Quotation
	LKC	Full length tolerance change L +0.4 ⇔ +0.05 +0.2 0	Full length tolerance change L +0.4 ⇔ +0.01 +0.2 0	
	LKZ	Full length tolerance change L +0.4 ⇔ +0.01 +0.2 0	Full length tolerance change L +0.4 ⇔ +0.01 +0.2 0	
Alterations to head	KC	⊕ Addition of single key flat to head	⊕ Key flat 90°/180° position change 1° increments	Quotation
	WKC	⊕ Addition of single key flat	⊕ Key flat 90°/180° position change 1° increments	
	HC	⊕ Double key flats in parallel Can be combined with KC. ⊕ Cannot be used for L(LC) < 16. ⊕ Cannot be used for D3-6 for straight types. ⊕ Cannot be combined with KC for shape (A).		
	TC	⊕ Head diameter change D ≤ HC < H 0.1mm increments		
Alterations to shank	TKC	⊕ Head thickness change +0.2 ⇔ +0.02 0 0	⊕ Head thickness tolerance change +0.2 ⇔ +0.02 0 0	Quotation
	TKM	⊕ Head thickness change +0.2 ⇔ 0 0 -0.02	⊕ Head thickness tolerance change +0.2 ⇔ 0 0 -0.02	
SKC	⊕ Single key flat on shank ⊕ Can be used for headed types only. ⊕ Can be used for D ≥ 8 and L(LC) ≥ 20. ⊕ Cannot be combined with KC·WKC.			

PUNCH GUIDE BUSHINGS

—EXTRA LONG—

—Headed—	RoHS	Shank diameter D	M H	D dimension	Catalog No.	Diagram	
	RoHS	Dm5	M H	D4-5	SLMHG		
						Equivalent to SKH51 61~64HRC	D6~10
—Straight—	RoHS	Dn5	M H	D4-5	SLMSG		
						Equivalent to SKH51 61~64HRC	D6~10

D tolerance		Catalog No.		L	0.01mm increments min. P max.	0.1mm increments B	b	d	H	
D	m5	n5	Type							D
4			Headed type (D _{m5}) SLMHG	4	16	20	10	2.4	5	
5	+0.009 +0.004	+0.013 +0.008		5	16	20		25	2.9	6
6				6	16	20		25	3.4	9
8	+0.012 +0.006	+0.016 +0.010	Straight type (D _{n5}) SLMSG	8	16	20	25	4.4	11	
10				10	16	20	25	6.4	13	

Features Because of the long guide length (B dimension), these bushings can be used for drawing and bending in which the punch must be guided over a long stroke.

Price Quotation

Order Catalog No. — L — P — B
 SLMHG 4 — 16 — P0.80 — B3.5
 SLMHG 5 — 16 — P1.00 — B4.0

Days to Ship Quotation

Alterations Catalog No. — L(LC) — P — B — (HC·TC, etc.)
 SLMHG 8 — LC15.0 — P3.01 — B10.0 — HC10.0

Alteration	Code	Spec.	1Code
	LC	Full length change (reduction in tip length) 10 ≤ L - (B - 1) ≤ LC < L 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Tip length b is shortened by (L - LC).	Quotation
		Full length change 10 ≤ L - (B - 1) ≤ LC < L 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.)	
	LKC	Full length tolerance change L +0.4 → +0.05 L +0.2 → 0	
	LKZ	Full length tolerance change L +0.4 → +0.01 L +0.2 → 0	

Alteration	Code	Spec.	1Code
	HC	Head diameter change D ≤ HC < H 0.1 mm increments	Quotation
	TC	Head thickness change 2 ≤ TC < 3 0.1 mm increments. If combined with TKC-TKM, 0.01 mm increments can be selected. Full length is shortened by (3 - TC). If combined with LC, full length is equal to LC.	
	TKC	Head thickness tolerance change T +0.2 → 0 T +0.2 → 0	
	TKM	Head thickness tolerance change T +0.2 → 0 T +0.2 → -0.02	

PUNCH GUIDE BUSHINGS

—DOUBLE-STEPPED GUIDE TYPE—

—Headed type—	RoHS	M H	D dimension	Catalog No.	Diagram	
	RoHS	M H	D3~5	FMHG		
					Equivalent to SKH51 61~64HRC	D6~8
—Straight—	RoHS	M H	D3~5	FMMSG		
					Equivalent to SKH51 61~64HRC	D6~8

Catalog No.		L	0.01mm increments		B	H
Type	D		min. P max.	min. G max.		
Headed type (D _{m5}) FMHG	3	10 13 16	0.80 ~ 1.98	2.00	2	4
	4	10 13 16	0.80 ~ 2.38	2.00 ~ 2.40		5
	5	10 13 16	0.80 ~ 2.88	2.00 ~ 2.90		6
Straight type (D _{n5}) FMMSG	6	10 13 16 20	0.80 ~ 3.38	3.00 ~ 3.40	3	9
	8	10 13 16 20	0.80 ~ 4.38	3.00 ~ 4.40	4	11

Bushing under the head and at the relief hole may be thin. Be careful not to damage the bushings when mounting them. If D=3, only 2.00 can be selected for G dimension.

Order Catalog No. — L — P — G
 FMHG 3 — 10 — P0.80 — G2.00
 FMMSG 5 — 16 — P1.00 — G2.50

Price Quotation

Days to Ship Quotation

Alterations Catalog No. — L(LC) — P — G — (HC·TC, etc.)
 FMHG 8 — LC15.0 — P3.01 — G4.00 — HC10.0

Alteration	Code	Spec.	1Code
	LC	Full length change (reduction in tip length) 10 ≤ L - (B - 1) ≤ LC < L 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.)	Quotation
		Full length change 10 ≤ L - (B - 1) ≤ LC < L 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.)	
	LKC	Full length tolerance change L +0.4 → +0.05 L +0.2 → 0	
	LKZ	Full length tolerance change L +0.4 → +0.01 L +0.2 → 0	

Alteration	Code	Spec.	1Code
	HC	Head diameter change D ≤ HC < H 0.1 mm increments	Quotation
	TC	Head thickness change 2 ≤ TC < 3 0.1 mm increments. If combined with TKC-TKM, 0.01 mm increments can be selected. Full length is shortened by (3 - TC). If combined with LC, full length is equal to LC.	
	TKC	Head thickness tolerance change T +0.2 → +0.02 T +0.2 → 0	
	TKM	Head thickness tolerance change T +0.2 → 0 T +0.2 → -0.02	

PUNCH GUIDE BUSHINGS

—BLOCK BUSHINGS, FIXING-BOLT TYPE/FLANGE TYPE—

—Block bushings, fixing-bolt type—

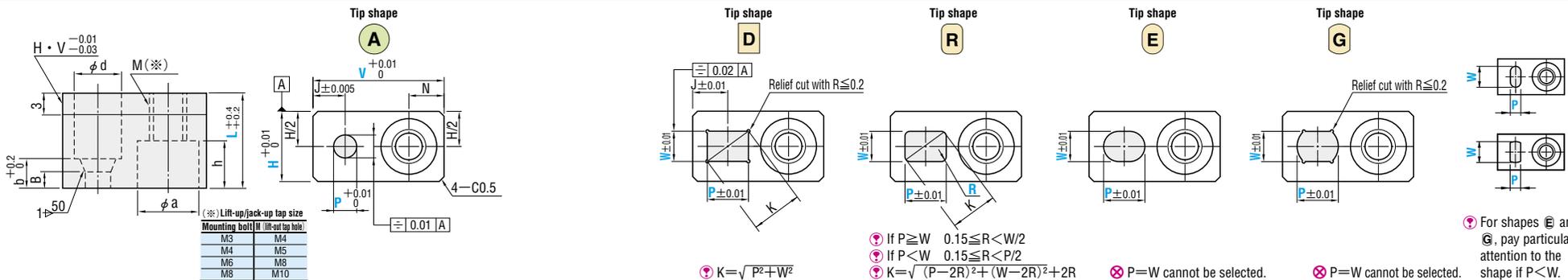


RoHS

Catalog No.

Equivalent to SKD11 60~63HRC

A BBG
D BBGD
R BBGR
E BBGE
G BBGG



Tip shape **A**, **D**, **R**, **E**, **G**

$K = \sqrt{P^2 + W^2}$
 $P \geq W$
 $0.15 \leq R < W/2$
 $P = W$ cannot be selected.

—Block, flange type—

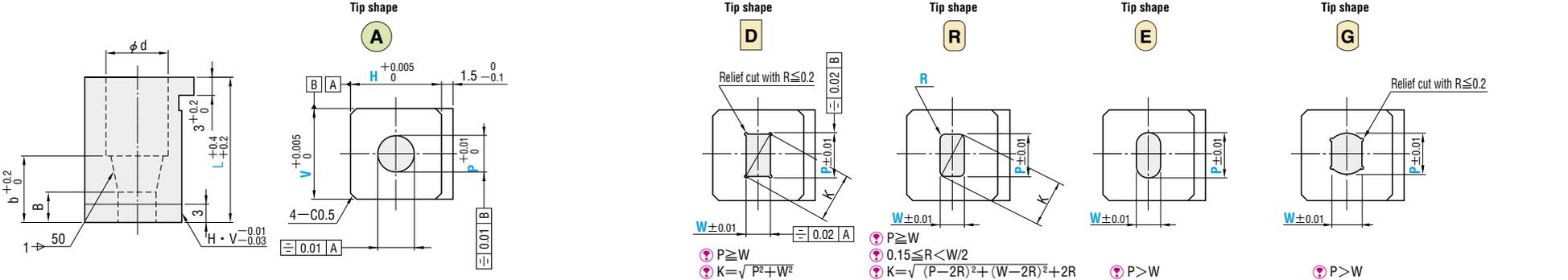


RoHS

Catalog No.

Equivalent to SKD11 60~63HRC

A BGF
D BGFD
R BGFR
E BGFE
G BGFG



Tip shape **A**, **D**, **R**, **E**, **G**

$K = \sqrt{P^2 + W^2}$
 $P \geq W$
 $0.15 \leq R < W/2$
 $P > W$

■ Block: fixing-bolt type

B	b	d	N	Mounting bolt		J	Catalog No.	V	H	L	0.01mm increments				Base unit price for 1~9 pieces
				a	h						Size	A	D R E G	R	
4	8	4.4	4	6	7.5	M3	4	16	8	16 20 22 25 30 35	1.00~4.00	4.00	1.00	Quotation	
		6.4	5	8	8.5	M4	4	18	10	16 20 22 25 30 35	1.00~6.00	6.00	1.00		
		8.4	6.5	11	10.5	M6	6.5	25	13	16 20 22 25 30 35	1.00~8.00	8.00	1.00		
6	10	10.6	8	14	12.5	M8	10	28	16	16 20 22 25 30 35	1.00~10.00	10.00	1.00		
		13.8	8	14	12.5	M8	10	35	20	16 20 22 25 30 35	1.50~13.00	13.00	1.50		
		16.8	8	14	12.5	M8	12.5	40	25	16 20 22 25 30 35	1.50~16.00	16.00	1.50		

■ Block: flange type

B	b	d	Catalog No.	V	H	L	0.01mm increments				Base unit price for 1~9 pieces
							A	D R E G	R	BGF	
4	8	4.4	A BGF	6	6	16 20 22 25 30 35	1.00~3.00	3.00	1.00	Quotation	
		6.4	D BGFD	8	8	16 20 22 25 30 35	1.00~4.00	4.00	1.00		
		8.4	R BGFR	10	10	16 20 22 25 30 35	1.00~6.00	6.00	1.00		
6	10	11.0	E BGFE	13	13	16 20 22 25 30 35	1.00~8.00	8.00	1.00		
		14.0	G BGFG	16	16	16 20 22 25 30 35	1.00~10.00	10.00	1.00		
		17.0		20	20	16 20 22 25 30 35	1.50~13.00	13.00	1.50		
		21.0		25	25	16 20 22 25 30 35	1.50~16.00	16.00	1.50		

Ⓜ Ⓜ shapes: P ≥ W Ⓜ Ⓜ shapes: P > W

Order Catalog No. V H L P W R (R only) Days to Ship **Quotation**

BBGE 25 13 - 20 - P6.34 - W4.65
 BGFR 20 20 - 16 - P9.50 - W2.50 - R0.25

Ⓜ P < W, pay particular attention to the tip shape.

P Price **Quotation**

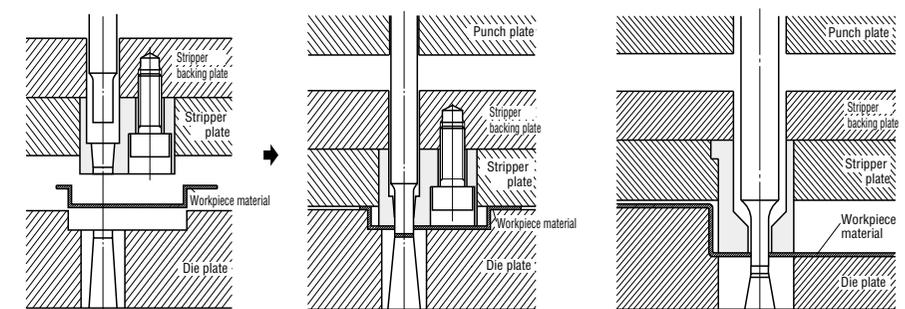
Alterations Catalog No. V H L (LC) P-W-R (BC-PKC, etc.)

BBG 25 13 - LC18 - P1.50 - BC3-LKC

Alteration	Code	A	D R E G	1Code
Alterations to guide	BC	Guide length change 1 ≤ BC ≤ b 0.1mm increments		Quotation
Alterations to full length	PKC	Tip diameter tolerance change P+0.01 → +0.005 0 → 0	Tip diameter tolerance change P-W±0.01 → +0.01 0 → 0	
Alterations to full length	LC	Full length change 16 < LC < 35 0.1mm increments (If combined with LKC-LKZ, 0.01mm increments can be selected.) Full length change 10 ≤ L - (B-1) ≤ LC < L If LC ≤ 12, press-in lead is not included for single flange types. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓜ Dimension b is shortened by (L-LC).		

Alteration	Code	A	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change L+0.4 → +0.05 +0.2 → 0		Quotation
Alterations to full length	LKZ	Full length tolerance change L+0.4 → +0.01 +0.2 → 0		
Others	VK1	V-H tolerance change V-H+0.01 → V-H+0.005 0 → 0 Ⓜ Cannot be used for flange types.		Quotation
	VK2	V-H tolerance change V-H+0.01 → V-H-0.005 0 → 0 Ⓜ Cannot be used for flange types.		
	NDC	No press-in lead		
	TKC	Head thickness tolerance change L+0.3 → +0.02 0 → 0 Ⓜ Cannot be used for fixing-bolt types.		

EX Example **Features** 1. Shims and other items can be used to make fine position adjustments. Shim tape FGSM-FGSM P.840
2. Can be used also as the cavity insert for a stripper plate. Spacer layer plate LHP P.839
Precision multipurpose plate UTPB P.841



Example of use as workpiece holder after bending process