

CARBIDE BUTTON DIES

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Product name
Type

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SCRAP RETENTION
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CARBIDE BUTTON DIES — GUIDE —

Button die type		Outer diameter tolerance	Normal			Scrap retention			Non-clogging	
			Round	Shaped	Page	Round	Shaped	Page	Round	Page
Carbide headed		V40 (HIP)	Dm5	WHD	P.481	SR—WHD	SR—WHD□	P.483	SV—WHD	P.485
			D $+0.005$ ₀	A—WHD		SRA—WHD	SRA—WHD□		SVA—WHD	
Carbide straight		V40 (HIP)	Dn5	WSD	P.481	SR—WSD	SR—WSD□	P.483	SV—WSD	P.485
			D $+0.005$ ₀	A—WSD		SRA—WSD	SRA—WSD□		SVA—WSD	
Carbide with angular head		V40 (HIP)	Dm5	WAHD	P.487	SR—WAHD	SR—WAHD□	P.489	SV—WAHD	P.491
			D $+0.005$ ₀	A—WAHD		SRA—WAHD	SRA—WAHD□		SVA—WAHD	
Carbide angular straight		V40 (HIP)	Dn5	WASD	P.487	SR—WASD	SR—WASD□	P.489	SV—WASD	P.491
			D $+0.005$ ₀	A—WASD		SRA—WASD	SRA—WASD□		SVA—WASD	

■ Scrap retention button dies (Products data P.1103)

●Applicable range

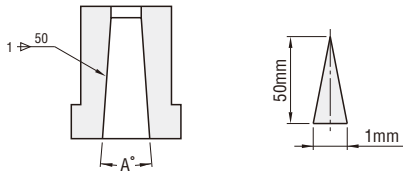
1. Hole diameter: $\phi 1.0 \sim \phi 16$
2. Workpiece material: Can be used for materials with tensile strengths up to 1177N/mm² (120Kgf/mm²)
3. Thickness of workpiece material: Minimum thickness 0.15mm
4. Scrap retention effects cannot be expected when the clearance (C) is larger than the workpiece material thickness (MT) by more than 20%. Therefore, keep the difference to 20% or less.

Clearance on one side (C) < Workpiece material thickness (MT) × 20%

- ⚠ Because scrap retention button dies prevent scrap lifting by forming small projections on punching scrap, they are not suitable in cases such as punching of precision holes, or when the punched-out item becomes the product.

■ Non-clogging button dies (Products data P.1105)

■ Indication of button die relief angles



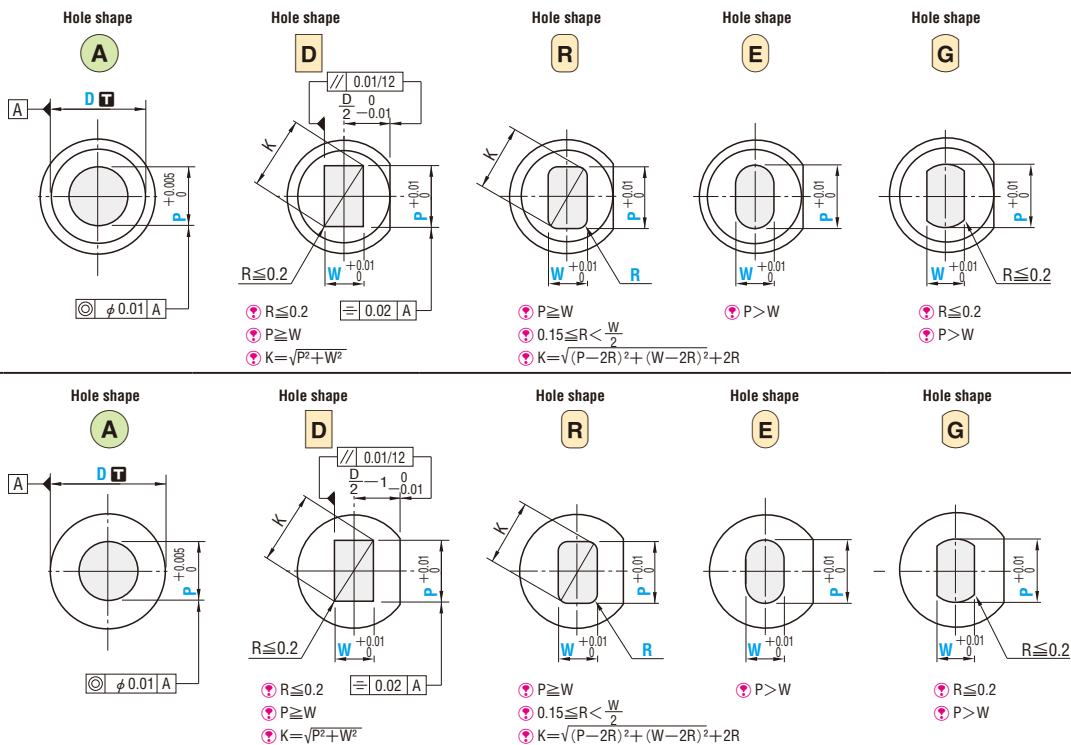
1 $\frac{50}{1}$ indicates a taper in which the diameter increases by 1 mm over 50 mm of length.

Taper	1/50	1/100	1/150
Angle (A°)	1.146°	0.573°	0.382°

—HEADED TYPE • STRAIGHT TYPE—

D tolerance			Catalog No.		L	0.01mm increments				b	d	H	T		
D	m5	n5	Type	D		A		D R E G						R	
						min.	P max.	P-Kmax.	P-Wmin.					R	
3	+0.006 +0.002	+0.008 +0.004	Headed (D _{m5})	Straight (D _{n5})	(3)	13 16 20 22 25 (30) (35)	0.50~	1.00	—	—	0.15≤R< $\frac{W}{Z}$ (R only)	2	1.4	4	3
4			WHD	WSD	(4)		0.50~	1.50	—	—			2.0	5	
5	+0.009 +0.004	+0.013 +0.008	WHDD	WSDD	(5)		0.50~	2.50	—	—			3.0	6	
6			WHDR	WSDR	6		1.00~	3.00	3.00	1.00		3	3.4	9	
8			WHDE	WSDE	8		1.00~	4.00	4.00	1.00		4	4.4	11	
10	+0.012 +0.006	+0.016 +0.010	WHDG	WSDG	10		2.00~	6.00	6.00	1.20		6	6.4	13	
13	+0.015 +0.007	+0.020 +0.012	A-WHD	A-WSD	13		3.00~	8.00	8.00	1.50		8	8.4	16	5
16			A-WHDD	A-WSDD	16		5.00~	10.00	10.00	2.00			10.6	19	
20	+0.017 +0.008	+0.024 +0.015	A-WHDE	A-WSDE	20		7.00~	12.00	12.00	2.00			12.6	23	
25			A-WHDDG	A-WSDDG	25		10.00~	16.00	16.00	2.00			16.6	28	

Ⓜ D = (3), (4), and (5) are specifications available for shape A (round) only. They are not available for shapes D R E G. Ⓜ L (30) ~ (35) ~ D8~25 Full length (30) ~ (35) are specifications available for D8~25 only.



Alterations



Catalog No. — L (LC·SLC) — P (PC) — W (WC) — R — (BC·HC·TC·CKC·MKC, etc.)
WHDD 10 — 25 — P5.00 — W3.20 — TC3.0·TKC·KFC45

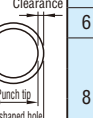
Alteration	Code	A	D R E G	1Code
Alterations to shaped hole	PC	Shaped hole diameter change min.: $\frac{P}{W} \geq \frac{P}{W_{min}} \geq 1.00$ 0.01mm increments		
	WC	max.: $\frac{P}{W} < \frac{P}{W_{max}} \leq P \cdot K_{max} + 0.2$ 0.01mm increments		
	BC	Shaped hole depth change $1 \leq BC \leq b$ 0.1mm increments For A only, $1 \leq BC \leq 4$ if PC1.00~1.99.		
Alterations to full length	LC	Full length change $10 \leq L - (b-1) \leq LC < L$ 0.1mm increments (If combined with LKC·LKZ·CKC·MKC, 0.01mm increments can be selected.) b dimension is shortened by $(L-LC)$.		
	LKC	Full length tolerance change $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{L}{L} + 0.2 \Rightarrow +0.01$		
	LKZ	Full length tolerance change $\frac{L}{L} + 0.4 \Rightarrow +0.01$ $\frac{L}{L} + 0.2 \Rightarrow +0.01$		
	CKC	Changes to head thickness tolerance Head thickness tolerance change + Full length tolerance change $\frac{T}{T} + 0.3 \Rightarrow +0.02$ $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{T}{T} + 0.2 \Rightarrow 0$ $\frac{L}{L} + 0.2 \Rightarrow 0$ Cannot be used for L (LC) < 16.		
	MKC	Changes to head thickness tolerance Head thickness tolerance change + Full length tolerance change $\frac{T}{T} + 0.3 \Rightarrow +0.02$ $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{T}{T} + 0.2 \Rightarrow -0.02$ $\frac{L}{L} + 0.2 \Rightarrow 0$ Cannot be used for L (LC) < 16.		
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (①) are the same as for LC.		
		LC Full length + Full length tolerance change $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{L}{L} + 0.2 \Rightarrow 0$		
		0.01mm increments Can be used for straight types only. Cannot be used for L (LC) < 10.		

Quotation

Alteration	Code	A	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head Key flat position change 1° increments		
	WKC	Addition of double key flats in parallel Cannot be combined with KC·KFC. Cannot be used for straight types with D3~5.		
	KFC	Addition of single key flat Cannot be used for D3~5.		
	HC	Head diameter change $D \leq HC < H$ 0.1mm increments		
	TC	Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC·TKM·CKC·MKC, 0.01mm increments can be selected.) Full length L is shortened by $(T-TC)$. If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change $\frac{T}{T} + 0.3 \Rightarrow +0.02$ $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{T}{T} + 0.2 \Rightarrow 0$ $\frac{L}{L} + 0.2 \Rightarrow 0$ Cannot be used for L (LC) < 16.		
	TKM	Head thickness tolerance change $\frac{T}{T} + 0.3 \Rightarrow +0.02$ $\frac{L}{L} + 0.4 \Rightarrow +0.05$ $\frac{T}{T} + 0.2 \Rightarrow -0.02$ $\frac{L}{L} + 0.2 \Rightarrow 0$ Cannot be used for L (LC) < 16.		
	SKC	Single key flat on shank Can be used for headed types only. Can be used for $D \geq 8$ and $L \geq 20$. Cannot be combined with KC·WKC·KFC.		

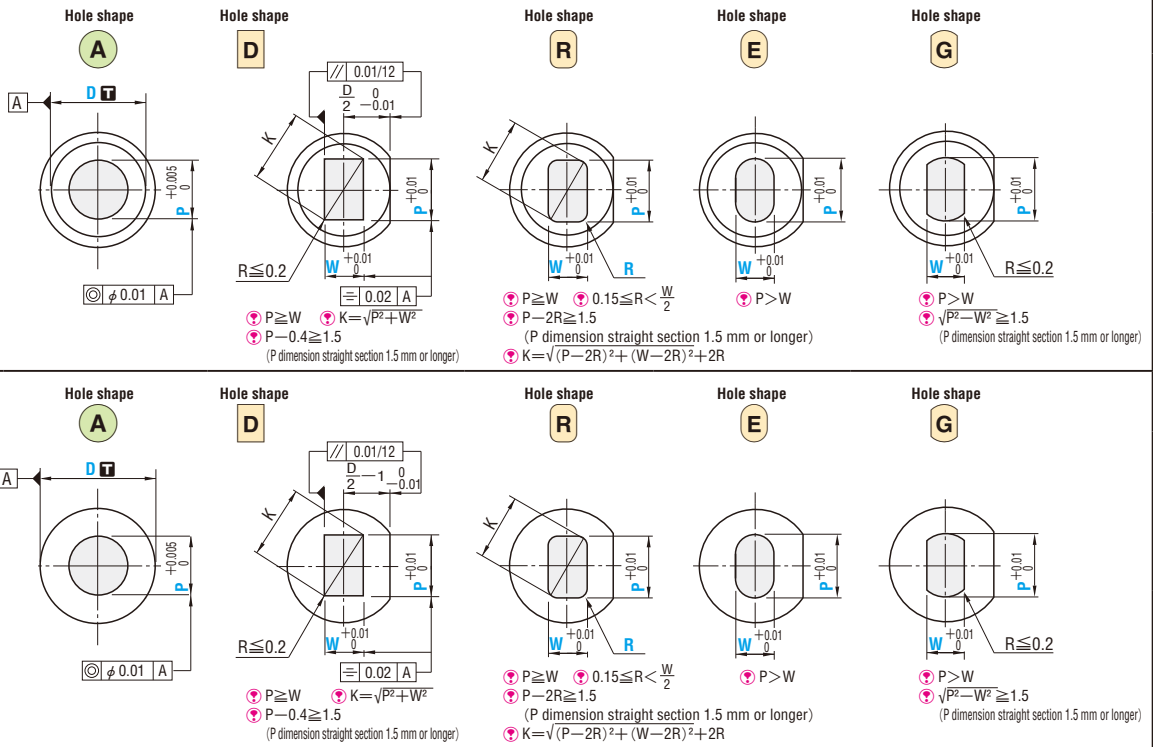
Quotation

—HEADED TYPE • STRAIGHT TYPE—

D tolerance			Catalog No.		L	0.01mm increments					0.005mm increments	b	d	H	T			
D	m5	n5	Type	D		A		D REG		R	MT (workpiece material thickness)					C (clearance)		
						min.	P max.	P·Kmax.	P·Wmin.	R								
4			Headed (D _{ms})	Straight (D _{ns})	(4)		1.00~	1.50	—	—	0.15≤R<$\frac{W}{2}$ (R only)	MT≥0.15 Select a workpiece material thickness of 0.15mm or more.	C≥0.010 Select a clearance of 0.010mm or more.		2	2.0	5	3
5	+0.009	+0.013	SR—WHDD	SR—WSD	(5)	13	1.00~	2.50	—	—								
6	+0.004	+0.008	SR—WHDR	SR—WSDR	6	16	1.00~	3.00	3.00	1.00								
8	+0.012	+0.016	SR—WHDE	SR—WSDE	8	20	1.00~	4.00	4.00	1.00								
10	+0.006	+0.010	SR—WHDG	SR—WSDG	10	22	2.00~	6.00	6.00	1.20								
13	+0.015	+0.020	(D ₀ +0.005)	(D ₀ +0.005)	13	25	3.00~	8.00	8.00	1.50								
16	+0.007	+0.012	SRA—WHDD	SRA—WSD	16	(30)	5.00~	10.00	10.00	2.00								
20	+0.017	+0.024	SRA—WHDR	SRA—WSDR	20	(35)	7.00~	12.00	12.00	2.00								
25	+0.008	+0.015	SRA—WHDE	SRA—WSDE	25		10.00~	16.00	16.00	2.00								
			SRA—WHDG	SRA—WSDG														

Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.





Alterations Catalog No. L (LC·SLC) P (PC) W (WC) R MT C (BC·HC·TC·CKC·MKC, etc.)

SR-WHDD 10 25 P5.00 W3.20 MT1.50 C0.105 TC3.0-TKC

Alteration	Code	A	D R E G	1Code
Alterations to shaped hole	PC	Shaped hole diameter change min.: $\frac{P}{W} < \frac{PC}{WC} \leq \frac{P}{W} \min. \geq 1.00$ 0.01mm increments ⊗ Cannot be combined with BC.		
	WC	max.: $\frac{P}{W} < \frac{WC}{WC} \leq P \cdot K_{max} + 0.2$ 0.01mm increments		
	BC	Shaped hole depth change $1 \leq BC < 2$ 0.1mm increments		
Alterations to full length	LC	Full length change $10 \leq L - (b-1) \leq LC < L$ 0.1mm increments (If combined with LKC-LKZ-CKC-MKC, 0.01mm increments can be selected.) ⊗ b dimension is shortened by (L-LC).		
	LKC	Full length tolerance change ⊗ Cannot be used for L(LC) < 10.	$L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$	
	LKZ	Full length tolerance change ⊗ Cannot be used for L(LC) < 10.	$L + 0.4 \Rightarrow +0.01$ $L + 0.2 \Rightarrow 0$	
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	TKC Head thickness tolerance change + Full length tolerance change $T + 0.3 \Rightarrow +0.02$ $T + 0 \Rightarrow 0$	LKC $L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$
	MKC		TKM Head thickness tolerance change + Full length tolerance change $T + 0.3 \Rightarrow 0$ $T + 0 \Rightarrow -0.02$	LKC $L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (⊗) are the same as for LC.	LC Full length + Full length tolerance change $L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$	LKC Full length + Full length tolerance change $L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$
		0.01mm increments ⊗ Can be used for straight types only. ⊗ Cannot be used for L(LC) < 10.		

Alteration	Code	A	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position 180° 270° 0° 90° ⊗ change 1° increments	
		Addition of single key flat	Key flat position 180° 270° 0° 90° ⊗ change 1° increments	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KC-KFC. ⊗ Cannot be used for straight types with D4-5.		
	KFC	Double key flats at 0° and a selected angle 1° increments	Double key flats at 0° and a selected angle 1° increments	
	HC	Head diameter change $D \leq HC < H$ 0.1mm increments		
	TC	Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC-TKM-CKC-MKC, 0.01mm increments can be selected.) ⊗ Full length L is shortened by (T-TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change $T + 0.3 \Rightarrow +0.02$ $T + 0 \Rightarrow 0$	⊗ Cannot be used for L(LC) < 16.	
Shank	TKM	Head thickness tolerance change $T + 0.3 \Rightarrow 0$ $T + 0 \Rightarrow -0.02$	⊗ Cannot be used for L(LC) < 16.	
	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-KFC.		

NON-CLOGGING CARBIDE BUTTON DIES

— HEADED TYPE · STRAIGHT TYPE —

Type		Shank diameter  tolerance	Catalog No.	Shape
— Headed —  For shank diameter tolerance $D \text{ } \text{$				

D tolerance			Catalog No.		L	0.01mm increments min. P max.	V	G	d	H	T
D	m5	n5	Type	D							
3	$^{+0.006}_{+0.002}$	$^{+0.008}_{+0.004}$	Headed (D_{m5})	3	13	0.50~1.00	0.4	0.2	1.4	4	3
4			Straight (D_{n5})	4	16	0.50~1.50			2.0	5	
5	$^{+0.009}_{+0.004}$	$^{+0.013}_{+0.008}$	SV—WHD	5	20	0.50~2.50			3.0	6	
6				6	22	1.00~3.00	0.8	0.3	3.4	9	5
8	$^{+0.012}_{+0.006}$	$^{+0.016}_{+0.010}$	($D^{+0.005}_0$) SVA—WHD	8	25	1.00~4.00			4.4	11	
10			($D^{+0.005}_0$) SVA—WSD	10		2.00~6.00			6.4	13	



Order

Catalog No. — L — P
SV—WHD10 — 25 — P4.50



Days to Ship

Quotation



Price

Quotation



Alterations



Catalog No. — L (LC·SLC) — P (PC) — (HC·TC·CKC·MKC, etc.)
SV—WSD8 — LC18 — PC4.20 — LKC

Alteration	Code	Spec.	1Code
Alterations to shaped hole		Shaped hole diameter change min.: $P > PC \geq \frac{P_{min.}}{2} \geq 1.00$ 0.01mm increments max.: $P < PC \leq P_{max.} + 0.2$ 0.01mm increments	
	PC		
Alterations to full length		Full length change $8 \leq LC < L$ 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) Press-in lead is shortened by $(L - LC)$. Cannot be used for headed types.	
	LC		
		Full length tolerance change Cannot be used for $L(LC) < 10$.	
	LKC		
	LKZ		
	CKC		
Alterations to head		Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	
	TKC		
	LKC		
	TKM		
Alterations to head		Head thickness tolerance change + Full length tolerance change $T + 0.3 \Rightarrow +0.02$ $L + 0.4 \Rightarrow +0.05$ 0 $\Rightarrow$ 0 $\Rightarrow$ 0 Cannot be used for $L(LC) < 16$.	
	TC		
Alterations to head		Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC·TKM·CKC·MKC, 0.01mm increments can be selected.) Full length L is shortened by $(T - TC)$. If combined with LC, full length is equal to LC.	
	TKC		
Alterations to head		Head thickness tolerance change $T + 0.3 \Rightarrow +0.02$ 0 $\Rightarrow$ 0 Cannot be used for $L(LC) < 16$.	
	TKM		

Quotation

Alteration	Code	Spec.	1Code
Alterations to head		Addition of single key flat to head	
	KC		
Alterations to head		Addition of single key flat Cannot be used for D3~5.	
	WKC		
Alterations to head		Addition of double key flats in parallel Cannot be combined with KC·KFC. Cannot be used for straight types.	
	KFC		
Alterations to head		Double key flats at 0° and a selected angle 1° increments Cannot be used for straight types. Cannot be used for $L(LC) < 16$. Cannot be combined with KC·WKC.	
	HC		
Alterations to head		Head diameter change $D \leq HC < H$ 0.1mm increments	
	TC		
Alterations to head		Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC·TKM·CKC·MKC, 0.01mm increments can be selected.) Full length L is shortened by $(T - TC)$. If combined with LC, full length is equal to LC.	
	TKC		
Alterations to head		Head thickness tolerance change $T + 0.3 \Rightarrow +0.02$ 0 $\Rightarrow$ 0 Cannot be used for $L(LC) < 16$.	
	TKM		

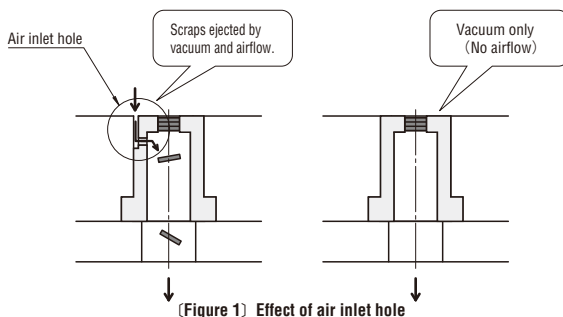
Quotation



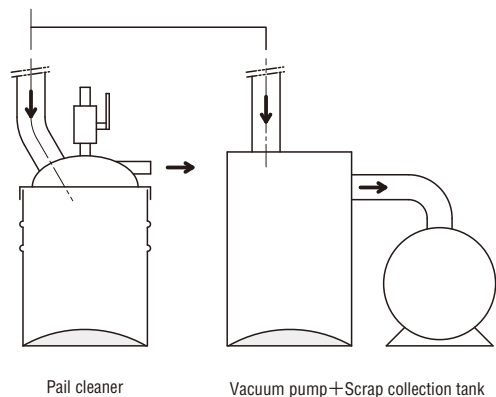
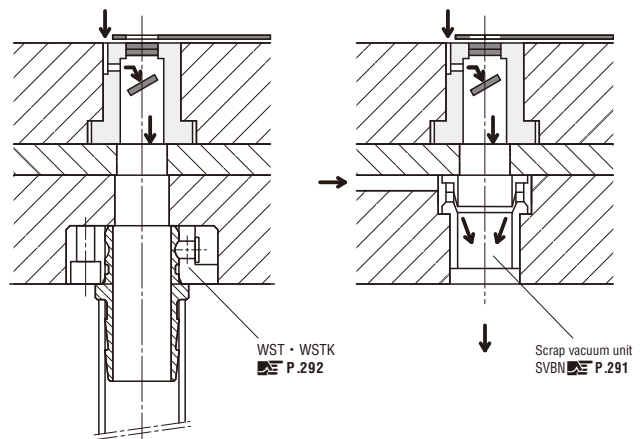
Example

Features

- These non-clogging carbide button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- Because an air inlet hole is created near the shaped hole, when a vacuum device is used to provide suction, an air flow is produced inside the button die. As a result, the scrap removal effect is higher than in button dies without air inlet holes. [Figure 1]
- It is also possible to use products such as a scrap vacuum unit (P.291) or commercially available pail-mounted cleaner as the vacuum device in place of the vacuum pump. In these cases, the drive source is compressed air from a compressor or other machine. [Figure 2]
- Non-clogging button dies [Products data] P.1105



(Figure 1) Effect of air inlet hole



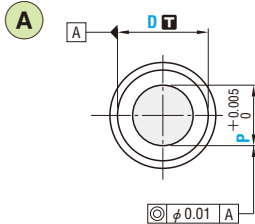
(Figure 2) Examples of Combinations with Various Vacuum Devices

CARBIDE ANGULAR BUTTON DIES

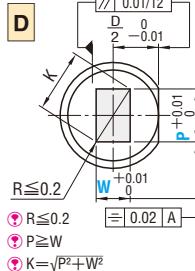
— HEADED TYPE · STRAIGHT TYPE —

— Headed —  For shank diameter tolerance D_T, select either m5 or $+0.005/0$.	RoHS M H V40 (HIP) 87~88HRA	Shank diameter D_T tolerance D_{m5} $D \begin{smallmatrix} +0.005 \\ 0 \end{smallmatrix}$	Catalog No. A WAHD D WAHDD R WAHDR E WAHDE G WAHDG A A-WAHD D A-WAHDD R A-WAHDR E A-WAHDE G A-WAHDG	
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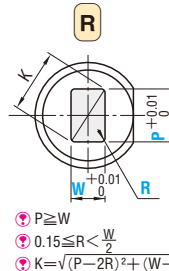
Hole shape



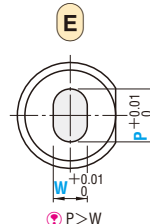
Hole shape



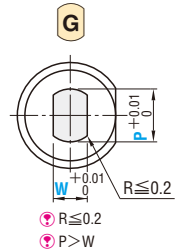
Hole shape



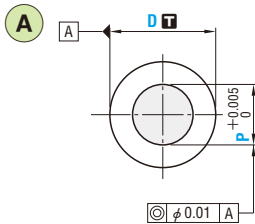
Hole shape



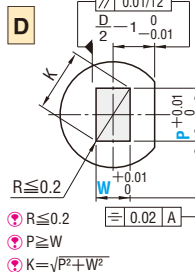
Hole shape



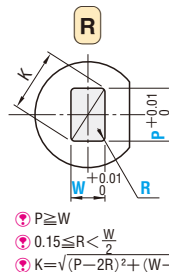
Hole shape



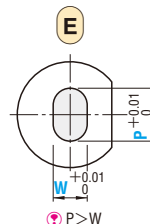
Hole shape



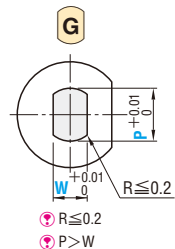
Hole shape



Hole shape



Hole shape



Alterations



Catalog No.

L(LC-SLC-LCT-LMT)

P(PC)

W(WC)

R

(BC-HC-TC-KC-MKC, etc.)

WAHDD 10

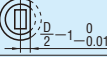
25

P5.00

W3.20

TC3.0—TKC

Alteration	Code	A	D R E G	1Code
Alterations to shaped hole	PC	Shaped hole diameter change $\min. \frac{P}{W} > \frac{PC}{WC} \geq \frac{P-W_{\min}}{2} \geq 1.00$ 0.01mm increments		
	WC	$\max. \frac{P}{W} < \frac{PC}{WC} \leq \frac{P-K_{\max}}{2} + 0.2$ 0.01mm increments		
Alterations to full length	BC	Shaped hole depth change $1 \leq BC \leq 4$ 0.1mm increments ✗ Cannot be used for P0.30~0.49.		
	LC	Full length change $10 \leq LC < L$ 0.1mm increments (If combined with LK-LKZ-KC-MKC, 0.01mm increments can be selected.) ✗ If $P=0.30 \sim 0.49$, $7 \leq LC \leq 16$.		
	LKC	Full length tolerance change ✗ Cannot be used for L(LC) < 16	$L+0.4 \rightarrow +0.05$ $L+0.2 \rightarrow 0$	
	LKZ	Full length tolerance change ✗ Cannot be used for L(LC) < 16	$L+0.4 \rightarrow +0.01$ $L+0.2 \rightarrow 0$	
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	TKC TKC Head thickness tolerance change + Full length tolerance change ✗ Cannot be used for L(LC) < 16.	
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	TKM LKC Head thickness tolerance change + Full length tolerance change ✗ Cannot be used for L(LC) < 16.	
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (✗) are the same as for LC.	LC LKC Full length change + Full length tolerance change ✗ 0.01mm increments ✗ Can be used for straight types only. ✗ Cannot be used for L(LC) < 10.	
	LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (✗), refer to the description of each alteration.	TKC LC LKC Head thickness + Full length + Full length tolerance change ✗ 0.01mm increments ✗ Cannot be used for L(LC) < 16.	
	LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (✗), refer to the description of each alteration.	TKM LC LKC Head thickness + Full length + Full length tolerance change ✗ 0.01mm increments ✗ Cannot be used for L(LC) < 16.	
	WKC	Addition of double key flats in parallel ✗ Cannot be combined with KC-KFC. ✗ Cannot be used for straight types with D5 or less.		

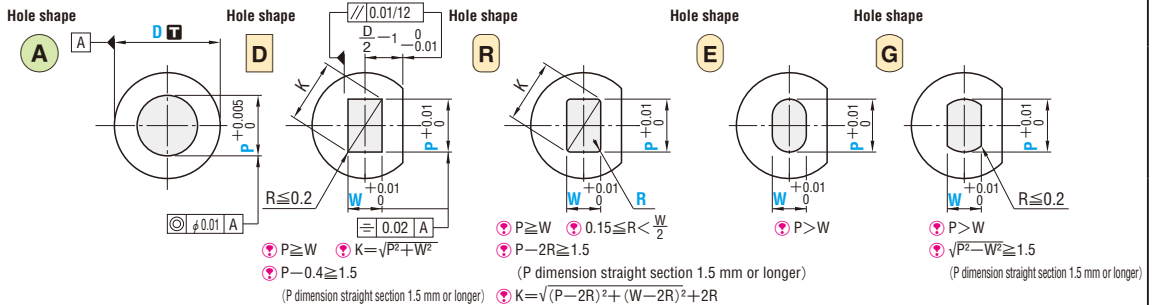
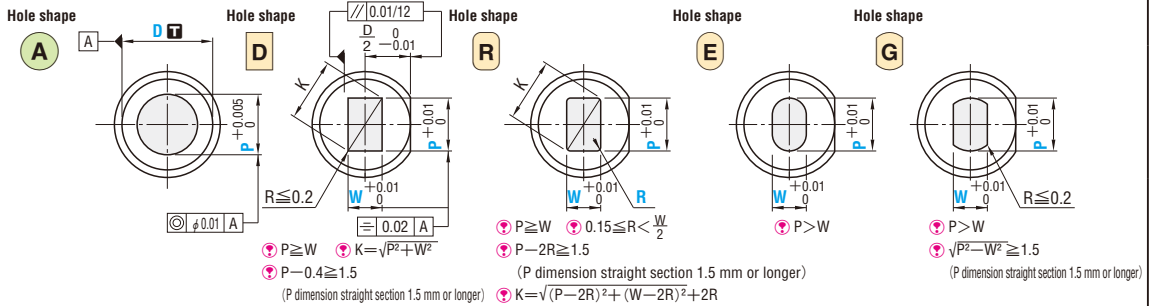
Alteration	Code	A	D R E G	1Code																							
Alterations to head	KC	 Addition of single key flat to head	 Key flat position change 1° increments																								
		 Addition of single key flat ✗ Cannot be used for D5 or less	 Key flat position change 1° increments																								
	KFC	 Double key flats at 0° and a selected angle 1° increments ✗ Cannot be used for straight types. ✗ Cannot be used for L(LC) < 16. ✗ Cannot be combined with KC-WKC.	 Double key flats at 0° and a selected angle 1° increments																								
	HC	 Head diameter change $D \leq HC < H$ 0.1mm increments																									
	TC	 Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC-TKM-KC-MKC, 0.01mm increments can be selected.) ✗ Full length L is shortened by (T-TC). If combined with LC, full length is equal to LC.																									
Alterations to shank	TKC	 Head thickness tolerance change ✗ Cannot be used for L(LC) < 16.	$T + 0.3 \rightarrow +0.02$ $T + 0.2 \rightarrow 0$																								
	TKM	 Head thickness tolerance change ✗ Cannot be used for L(LC) < 16.	$T + 0.3 \rightarrow 0$ $T + 0.2 \rightarrow -0.02$																								
	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-KFC-ANF.																									
	ANF	 Angular angle change $0.4 \leq ANF \leq 1.2$ 0.2° increments ✗ $d \leq d_{\max}$. ✗ $d = P + 2((L-B) \times \tan(ANF))$ ✗ $P - B \tan(ANF) \geq 0.6$ ✗ $W - B \tan(ANF) \geq 0.6$ ✗ Cannot be used for P-W < 1.00. ✗ Cannot be used for D < 6. ✗ Cannot be combined with SKC-KM.	<table><tr><th>D</th><th>dmax.</th></tr><tr><td>6</td><td>3.4</td></tr><tr><td>8</td><td>4.4</td></tr><tr><td>10</td><td>6.4</td></tr><tr><td>13</td><td>8.4</td></tr><tr><td>16</td><td>10.6</td></tr><tr><td>20</td><td>12.6</td></tr><tr><td>25</td><td>16.6</td></tr></table>  Taper 1/50 Angle (one side) (0.191°)	D	dmax.	6	3.4	8	4.4	10	6.4	13	8.4	16	10.6	20	12.6	25	16.6								
	D	dmax.																									
6	3.4																										
8	4.4																										
10	6.4																										
13	8.4																										
16	10.6																										
20	12.6																										
25	16.6																										
KM	 Addition of key groove to prevent lifting ✗ Cannot be used for D < 6. ✗ Cannot be combined with WKC-ANF. If D=6, can be used for hole shape A only.	<table><tr><th>D</th><th>h</th><th>ℓ</th></tr><tr><td>6</td><td>1</td><td>5</td></tr><tr><td>8</td><td>1.5</td><td>5</td></tr><tr><td>10</td><td>1.5</td><td>5</td></tr><tr><td>13</td><td>1.5</td><td>5</td></tr><tr><td>16</td><td>1.5</td><td>5</td></tr><tr><td>20</td><td>2</td><td>5</td></tr><tr><td>25</td><td>2</td><td>5</td></tr></table> $5 \leq \ell < L$ 0.1mm increments	D	h	ℓ	6	1	5	8	1.5	5	10	1.5	5	13	1.5	5	16	1.5	5	20	2	5	25	2	5	
D	h	ℓ																									
6	1	5																									
8	1.5	5																									
10	1.5	5																									
13	1.5	5																									
16	1.5	5																									
20	2	5																									
25	2	5																									
KM	 KM machining adds key flats in symmetrically opposite positions																										

—HEADED TYPE • STRAIGHT TYPE—

D tolerance			Catalog No.			L	0.01mm increments				0.005mm increments		H	T
D	m5	n5	Type		D		(A) min. P max.	D REG P-Kmax. P-Wmin.	R R	MT (workpiece material thickness)	C (clearance)			
4			Headed (Dm5)	Straight (Dn5)	(4)		1.00 ~ 1.50	—	—	MT ≥ 0.15 Select a workpiece material thickness of 0.15mm or more. 		5	3	
5	+0.009 +0.004	+0.013 +0.008	SR—WAHD	SR—WASD	(5)	13	1.00 ~ 2.50	—	—		6			
6			SR—WAHDD	SR—WASDD	6	16	1.00 ~ 3.00	3.00	1.00		9			
8			SR—WAHDR	SR—WASDR	8	20	1.00 ~ 4.00	4.00	1.00		11	5		
10	+0.012 +0.006	+0.016 +0.010	SR—WAHDE	SR—WASDE	10	22	2.00 ~ 6.00	6.00	1.20		13			
			SR—WAHDG	SR—WASDG	10	22	2.00 ~ 6.00	6.00	1.20		13			
13	+0.015 +0.007	+0.020 +0.012	(D ₀ +0.005) SRA—WAHD	(D ₀ +0.005) SRA—WASD	13	25	3.00 ~ 8.00	8.00	1.50		16			
16			SRA—WAHDD	SRA—WASDD	16	(30)	5.00 ~ 10.00	10.00	2.00		19			
20			SRA—WAHDR	SRA—WASDR	20	(35)	7.00 ~ 12.00	12.00	2.00		23			
	+0.017 +0.008	+0.024 +0.015	SRA—WAHDE	SRA—WASDE	20		7.00 ~ 12.00	12.00	2.00		23			
25			SRA—WAHDG	SRA—WASDG	25		10.00 ~ 16.00	16.00	2.00	28				

Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

P Price **Quotation**



Alterations



Catalog No. SR-WAHD 10

25

L (LC-SLC-LCT-LMT)

P (PC)

W (WC)

R

MT

C

BC-HC-TC-KC-KFC-MKC, etc.)

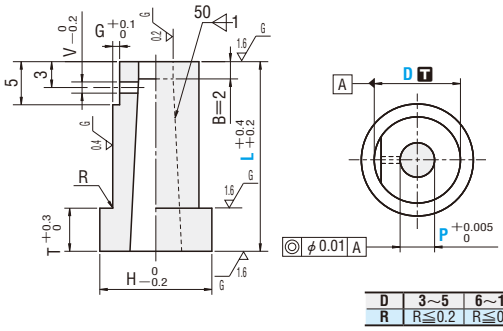
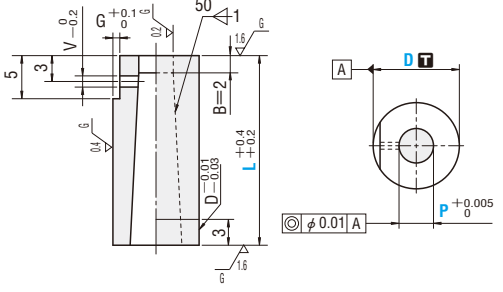
TC3.0-TKC

Alteration	Code	A	D R E G	1Code
Alterations to shaped hole	PC	Shaped hole diameter change $\min. \frac{P}{W} \geq \frac{P}{W_{min}} \geq 1.00$ 0.01mm increments		
	WC	Shaped hole diameter change $\max. \frac{P}{W} \leq \frac{P}{W_{max}} + 0.2$ 0.01mm increments		
Alterations to full length	BC	Shaped hole depth change $1 \leq BC < 2$ 0.1mm increments		
	LC	Full length change $10 \leq LC < L$ 0.1mm increments (If combined with LK-LKZ-KC-MKC, 0.01mm increments can be selected.)		
	LKC	Full length tolerance change $\pm 0.4 \rightarrow \pm 0.05$ 0		
	LKZ	Full length tolerance change $\pm 0.4 \rightarrow \pm 0.01$ 0		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.		
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC.		
	LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (P), refer to the description of each alteration.		
	LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (P), refer to the description of each alteration.		
	WKC	Addition of double key flats in parallel Cannot be combined with KC-KFC. Cannot be used for straight types with D4.5.		

Alteration	Code	A	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head Key flat position change 1° increments		
	KFC	Addition of single key flat Key flat position change 1° increments		
	HC	Head diameter change $D \leq HC < H$ 0.1mm increments		
	TC	Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC-TKM-KKC-MKC, 0.01mm increments can be selected.)		
	TKC	Head thickness tolerance change $\pm 0.3 \rightarrow \pm 0.02$ 0		
	TKM	Head thickness tolerance change $\pm 0.3 \rightarrow \pm 0.02$ 0		
	SKC	Single key flat on shank Can be used for headed types only. Can be used for $D \geq 8$ and $L (LC) \geq 20$. Cannot be combined with KC-WKC-KFC-ANF.		
	ANF	Angular angle change $0.4 \leq ANF \leq 1.2$ 0.2° increments $d \leq d_{max}$ $d = P + 2(L - B) \times \tan(ANF)$ $P - B \tan(ANF) \geq 0.6$ $W - B \tan(ANF) \geq 0.6$ Cannot be used for $P \cdot W < 1.00$. Cannot be combined with SKC-KM.		
	KM	Addition of key groove to prevent lifting Cannot be used for $D < 6$. If $D = 6$, can be used for hole shape A only.		

NON-CLOGGING CARBIDE ANGULAR BUTTON DIES WITH AIR HOLES

—HEADED TYPE·STRAIGHT TYPE—

Type		Shank diameter D 	Catalog No.	Shape
—Headed—  RoHS		D_{m5} V40 (HIP) 87~88HRA	SV—WAHD	
		D₀^{+0.005} V40 (HIP) 87~88HRA	SVA—WAHD	
—Straight—  RoHS		D_{n5} V40 (HIP) 87~88HRA	SV—WASD	
		D₀^{+0.005} V40 (HIP) 87~88HRA	SVA—WASD	

For shank diameter tolerance D , select either m5 or $\begin{smallmatrix} +0.005 \\ 0 \end{smallmatrix}$.

For shank diameter tolerance D , select either m5 or $\begin{smallmatrix} +0.005 \\ 0 \end{smallmatrix}$.

D tolerance			Catalog No.		L	0.01mm increments	V	G	H	T
D	m5	n5	Type	D		min. P max.				
3	+0.006 +0.002	+0.008 +0.004	Headed (D _{m5}) SV—WAHD	Straight (D _{n5}) SV—WASD	3	0.50~1.00	0.4	0.2	4	3
4	+0.009 +0.004	+0.013 +0.008			4	0.50~1.50			5	
5					5	0.50~2.50			6	
6					6	1.00~3.00			9	
8	+0.012 +0.006	+0.016 +0.010	(D ^{+0.005} ₀) SVA—WAHD	(D ^{+0.005} ₀) SVA—WASD	8	1.00~4.00	0.8	0.3	11	5
10					10	2.00~6.00			13	



Order

Catalog No. — **L** — **P**
SV—WAHD10 — 25 — P4.50



Days to Ship

Quotation



Price

Quotation



Alterations



Catalog No. — L (LC·SLC·LCT·LMT) — P (PC) — (BC·HC·TC·CKC·MKC, etc.)
SV—WAHD10 — LC18 — PC5.60 — TKC — ANF1.0

Alteration	Code	Spec.	1Code
Alterations to shaped hole	PC	Shaped hole diameter change $\min.: P > PC \geq \frac{P_{\min.}}{2} \geq 1.00$ 0.01mm increments $\max.: P < PC \leq P_{\max.} + 0.2$ 0.01mm increments	
	BC	Shaped hole depth change $1 \leq BC < 2$ 0.1mm increments	
Alterations to full length	LC	Full length change $13 \leq LC < L$ 0.1mm increments (If combined with LKC-LKZ-CKC-MKC, 0.01mm increments can be selected.)	
	LKC	Full length tolerance change $L + 0.4 \Rightarrow +0.05$ $L + 0.2 \Rightarrow 0$ ✗ Cannot be used for L (LC) < 16.	Quotation
	LKZ	Full length tolerance change $L + 0.4 \Rightarrow +0.01$ $L + 0.2 \Rightarrow 0$ ✗ Cannot be used for L (LC) < 16.	
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (✗) are the same as for LC.	
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (✗) are the same as for LC.	
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (✗) are the same as for LC.	
	LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (✗), refer to the description of each alteration.	
	LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (✗), refer to the description of each alteration.	

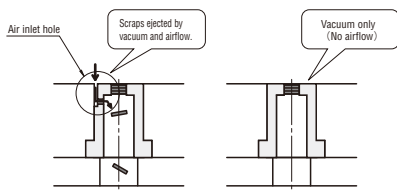
	Alteration	Code	Spec.	1Code																		
Alterations to head		KC	Addition of single key flat to head ✗ Cannot be used for straight types.																			
			Addition of single key flat ✗ Cannot be used for D3~5. ✗ Cannot be used for headed types.																			
		WKC	Addition of double key flats in parallel ✗ Cannot be combined with KC·KFC. ✗ Cannot be used for straight types.																			
			KFC	Double key flats at 0° and a selected angle1° increments ✗ Cannot be used for straight types. ✗ Cannot be used for L (LC) < 16. ✗ Cannot be combined with KC·WKC.																		
		HC	Head diameter change $D \leq HC < H$ 0.1mm increments																			
		TC	Head thickness change $2 \leq TC < T$ 0.1mm increments (If combined with TKC-TKM-CKC-MKC, 0.01mm increments can be selected.) ✗ Full length L is shortened by (T-TC). If combined with LC, full length is equal to LC.	Quotation																		
		TKC	Head thickness tolerance change $T + 0.3 \Rightarrow +0.02$ $T + 0 \Rightarrow 0$ ✗ Cannot be used for L (LC) < 16.																			
	TKM	Head thickness tolerance change $T + 0.3 \Rightarrow +0.02$ $T + 0 \Rightarrow -0.02$ ✗ Cannot be used for L (LC) < 16.																				
Alterations to shank		ANF	Angular angle change $0.2 \leq ANF \leq 1.2$ 0.2° increments ✗ $d \leq d_{\max.}$ ✗ $d = P + 2 \cdot (L - B) \cdot \tan(ANF)$ ✗ $P - B \tan(ANF) \geq 0.6$ ✗ Cannot be used for P < 1.00. ✗ Cannot be combined with KM.	<table><tr><th>D</th><th>d max.</th></tr><tr><td>3</td><td>2.0</td></tr><tr><td>4</td><td>2.4</td></tr><tr><td>5</td><td>2.9</td></tr><tr><td>6</td><td>3.4</td></tr><tr><td>8</td><td>4.4</td></tr><tr><td>10</td><td>6.4</td></tr></table> <table><tr><th>l</th><th>l max.</th></tr><tr><td>10</td><td>0.573</td></tr></table>	D	d max.	3	2.0	4	2.4	5	2.9	6	3.4	8	4.4	10	6.4	l	l max.	10	0.573
	D	d max.																				
3	2.0																					
4	2.4																					
5	2.9																					
6	3.4																					
8	4.4																					
10	6.4																					
l	l max.																					
10	0.573																					
	KM	Addition of key groove to prevent lifting ✗ Cannot be used for headed types. ✗ Cannot be used for D < 6. ✗ Cannot be combined with WKC-ANF.	<table><tr><th>D</th><th>h</th><th>l</th></tr><tr><td>6</td><td>1</td><td>1</td></tr><tr><td>8</td><td>1.5</td><td>1.5</td></tr><tr><td>10</td><td>2</td><td>2</td></tr></table> $5 \leq l < L$ 0.1mm increments ✗ KM is machined in a position symmetrically opposite the air inlet.	D	h	l	6	1	1	8	1.5	1.5	10	2	2							
D	h	l																				
6	1	1																				
8	1.5	1.5																				
10	2	2																				



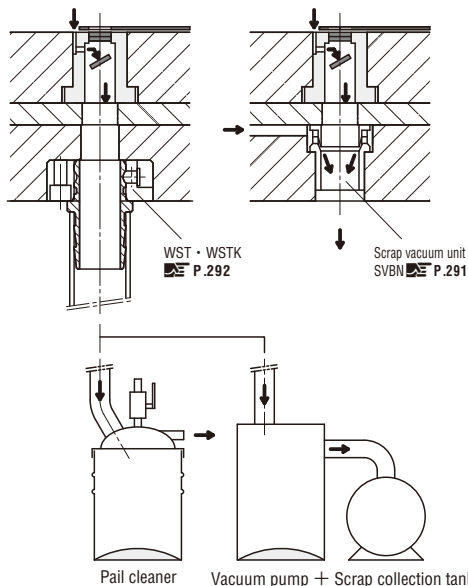
Example

Features

- These non-clogging carbide angular button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- Because an air inlet hole is created near the shaped hole, when a vacuum device is used to provide suction, an air flow is produced inside the button die. As a result, the scrap removal effect is higher than in button dies without air inlet holes. [Figure 1]
- It is also possible to use products such as a scrap vacuum unit (P.291) or commercially available pail-mounted cleaner as the vacuum device in place of the vacuum pump. In these cases, the drive source is compressed air from a compressor or other machine. [Figure 2]
- Non-clogging button dies (Products data) P.1105



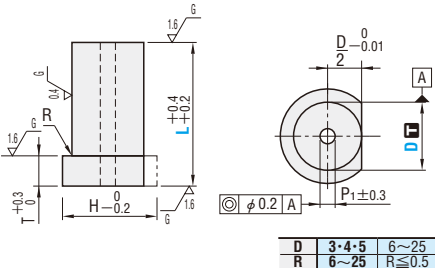
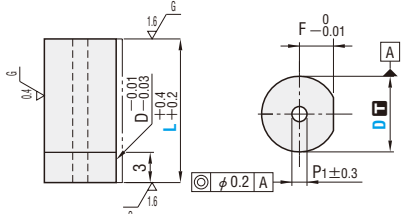
(Figure 1) Effect of air inlet hole



(Figure 2) Examples of Combinations with Various Vacuum Devices

CARBIDE BUTTON DIE BLANKS

— HEADED • STRAIGHT —

—Headed—	RoHS	M H	Shank diameter D T tolerance	Catalog No.	
 For shank diameter tolerance D T, select either m5 or $^{+0.005}_0$.			D_{m5}	WAHD—B	
			$D^{+0.005}_0$	A—WAHD—B	
—Straight—	RoHS	M H	Shank diameter D T tolerance	Catalog No.	
 For shank diameter tolerance D T, select either m5 or $^{+0.005}_0$.			D_{n5}	WASD—B	
			$D^{+0.005}_0$	A—WASD—B	

Catalog No.		L	P ₁	F	H	T	Base unit price 1~4 pieces		
Type	D						WAHD—B A—WAHD—B	WASD—B A—WASD—B	
Headed (D _{ms}) (D ^{+0.005} ₀)	3	13	0.7	1.0	4	3	Quotation		
	4			1.5	5				
	5	16		2.0	6				
	Straight (D _{ns}) (D ^{+0.005} ₀)	6	20	1.7	2.0	9			5
		8	22		3.0	11			
10		25	4.0		13				
13		25	2.2	5.5	16				
16		(30)		7.0	19				
20		(35)		9.0	23				
25				11.5	28				

① L (30) • (35) → D8~25 Full length L (30) • (35) are specifications available for D8~25 only.



Order

Catalog No. — L
A—WAHD—B 13 — 25



Days to Ship

Quotation



Alterations

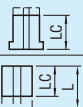


Catalog No. — L (LC•SLC) — (HC•TC•TKC•TKM, etc.)
WAHD—B 13 — LC23 — TC3.0—TKC



Price

Quotation

Alteration	Code	Spec.	1Code
Alterations to full length 	LC	Full length change 10≤LC<L 0.1mm increments (If combined with LKC•LKZ, 0.01mm increments can be selected.)	Quotation
		Full length change 8≤LC<L 0.1mm increments (If combined with LKC•LKZ, 0.01mm increments can be selected.)	
	LKC	Full length tolerance change ⊗ Cannot be used for L (LC) < 16. L +0.4 → +0.05 +0.2 0	
	LKZ	Full length tolerance change ⊗ Cannot be used for L (LC) < 16. L +0.4 → +0.01 +0.2 0	

Alteration	Code	Spec.	1Code
Alterations to head 	WKC	Addition of double key flats in parallel ⊗ Cannot be used for WASD—B•A—WASD—B D3~5. ⊗ Cannot be used for straight types.	Quotation
	KFC	Double key flats at 0° and a selected angle 1° increments 180° 0° 90° ⊗ Cannot be combined with WKC. ⊗ Cannot be used for L (LC) < 16. ⊗ Cannot be used for straight types.	
	NKC	No key flat	
	HC	Head diameter change D≤HC<H 0.1mm increments	
	TC	Head thickness change 2≤TC<T 0.1mm increments (If combined with TKC•TKM, 0.01mm increments can be selected.) ① Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	
	TKC	Head thickness tolerance change T +0.3 → +0.02 0 ⊗ Cannot be used for L (LC) < 16.	
	TKM	Head thickness tolerance change T +0.3 → -0.02 0 ⊗ Cannot be used for L (LC) < 16.	

SPACERS

—FOR ANGULAR BUTTON DIES AND STRAIGHT BUTTON DIES WITH RELIEF HOLES—

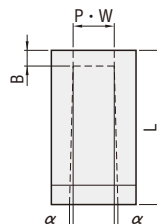
—For angular button dies—

RoHS



M SK5
H 45HRC~

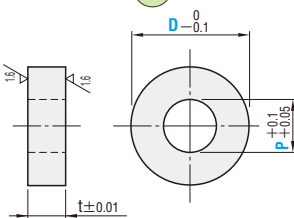
■ Button die L dimension and P·W spread



($\alpha \times 2$) part dimension: Spread of P·W (when B=2) Values in the table below are values for the α part on each side.

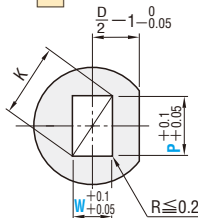
L	Taper	1/50	1/100	1/150
16		0.28	0.14	0.09
20		0.36	0.18	0.12
22		0.40	0.20	0.13
25		0.46	0.23	0.15
30		0.56	0.28	0.19
35		0.66	0.33	0.22

Hole shape
A SSD



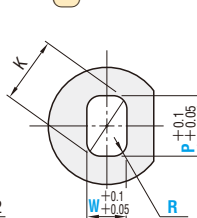
⚡ The outside diameter has slight depression.

Hole shape
D SSDD



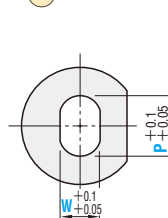
⚡ $P \geq W$
⚡ $K = \sqrt{P^2 + W^2}$

Hole shape
R SSRD



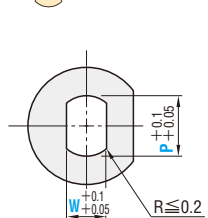
⚡ $P \geq W$
⚡ $0.15 \leq R < \frac{W}{2}$
⚡ $K = \sqrt{(P-2R)^2 + (W-2R)^2} + 2R$

Hole shape
E SSDE



⚡ $P > W$

Hole shape
G SSDG



⚡ $P > W$

Catalog No.		0.01mm increments					t	Base unit price (8-piece set)
Type	D	min.	P max.	P-Kmax.	P-Wmin.	R		
A SSD	6	1.00~	4.00	—	—	—	0.05	Quotation
	8	1.00~	5.00	5.00	1.00	—	0.1	
D SSDD	10	2.00~	7.00	7.00	1.20	—	0.2	
R SSRD	13	3.00~	9.00	9.00	1.50	—	0.3	
E SSDE	16	5.00~	12.00	12.00	2.00	—	0.5	
G SSDG	20	7.00~	16.00	16.00	3.00	—	1.0	
	25	10.00~	20.00	20.00	3.00	—	1.5	
							2.0	

⚡ 1 set consists of 8 spacers (1 of each t dimension).



Order

Catalog No. — P — W — R (R only)
SSDG 10 — P5.65 — W3.25



Days to Ship

Quotation



Alterations

Catalog No. — P — W — R — (KC)
SSDD 8 — P3.60 — W2.85 — KC90



Price

Quotation

Alteration	Code	A	D	R	E	G	1Code
Head	Ⓚ	KC	Ⓚ	Ⓚ	Ⓚ	Ⓚ	Ⓚ
			270°	180°	90°	0°	Key flat position change 1° increments

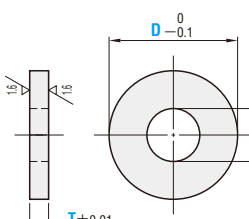
—For straight button die with relief holes—

RoHS



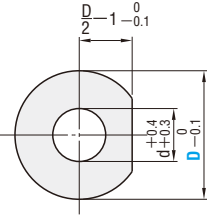
M SK5
H 45HRC~

Hole shape
A SSDN



⚡ The outside and inside diameter has slight depression.

Hole shape
D REG



Catalog No.		Base unit price (5-piece set) 1 ~ 9 sets				
d	Type	D	T	T0.05	T0.1	T0.2
3.4		6				
4.4		8	0.05			
6.4	SSDN (for round die D6 ~ 25)	10	0.1			
8.4	SSDHN (for shaped die D8 ~ 25)	13	0.2			
10.6		16	0.5			
12.6		20	1.0			
16.6		25				

⚡ A set consists of 5 spacers of the same T dimension.
For example, with T0.1, a set consists of 5 spacers of thickness 0.1.



Order

Catalog No. — T
SSDN 6 — 0.1



Days to Ship

Quotation



Price

Quotation