CARBIDE BUTTON DIES

CARBIDE BUTTON DIES

Product name / Type	CARBIDE BUTTON DIES	SCRAP RETENTION CARBIDE BUTTON DIES	NON-CLOGGING CARBIDE BUTTON DIES
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CARBIDE ANGULAR BUTTON DIES	SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	NON-CLOGGING CARBIDE ANGULAR BUTTON DIES
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CARBIDE BUTTON DIE BLANKS	SPACERS —FOR ANGULAR BUTTON DIES—	SPACERS —FOR STRAIGHT BUTTON DIE WITH RELIEF HOLES—
593	594	594

CARBIDE BUTTON DIES —GUIDE—

Button die type		M	Outer diameter tolerance	Normal Round	Normal Shaped	Normal Page	Scrap retention Round	Scrap retention Shaped	Scrap retention Page	Non-clogging Round	Non-clogging Page
Carbide headed		V40(HIP)	D_{m5}	WHD	WHD□	P.581	SR—WHD	SR—WHD□	P.583	SV—WHD	P.585
			$D\ ^{+0.005}_{0}$	A—WHD	A—WHD□		SRA—WHD	SRA—WHD□		SVA—WHD	
Carbide straight		V40(HIP)	D_{n5}	WSD	WSD□	P.581	SR—WSD	SR—WSD□	P.583	SV—WSD	P.585
			$D\ ^{+0.005}_{0}$	A—WSD	A—WSD□		SRA—WSD	SRA—WSD□		SVA—WSD	
Carbide with angular head		V40(HIP)	D_{m5}	WAHD	WAHD□	P.587	SR—WAHD	SR—WAHD□	P.589	SV—WAHD	P.591
			$D\ ^{+0.005}_{0}$	A—WAHD	A—WAHD□		SRA—WAHD	SRA—WAHD□		SVA—WAHD	
Carbide angular straight		V40(HIP)	D_{n5}	WASD	WASD□	P.587	SR—WASD	SR—WASD□	P.589	SV—WASD	P.591
			$D\ ^{+0.005}_{0}$	A—WASD	A—WASD□		SRA—WASD	SRA—WASD□		SVA—WASD	

■ Scrap retention button dies (Products data P.1619)

●Applicable range

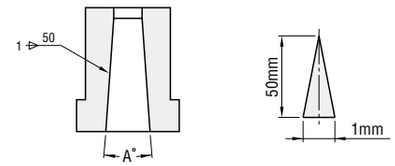
1. Hole diameter: ϕ 1.0 ~ ϕ 16
2. Workpiece material: Can be used for materials with tensile strengths up to 1177N/mm^2 (120Kgf/mm^2)
3. Thickness of workpiece material: Minimum thickness 0.15mm
4. Scrap retention effects cannot be expected when the clearance (C) is larger than the workpiece material 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.1621)

■ Indication of button die relief angles



1 $\rightarrow^{50}$ 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°

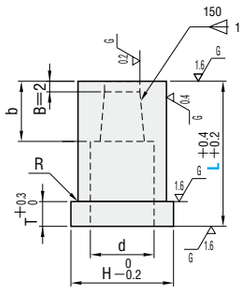
CARBIDE BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

—Headed—

RoHS

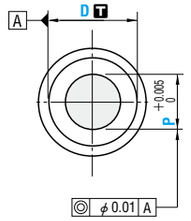
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WHD Ⓓ WHDD Ⓡ WHDR Ⓔ WHDE Ⓖ WHDG
	D $^{+0.005}_{0}$	Ⓐ A—WHD Ⓓ A—WHDD Ⓡ A—WHDR Ⓔ A—WHDE Ⓖ A—WHDG

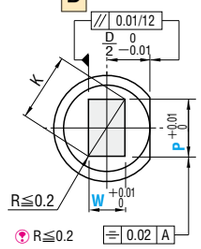


D	3・4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ

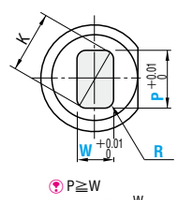


Hole shape Ⓓ



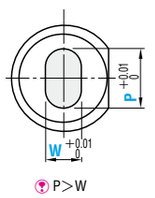
- R≦0.2
- P≧W
- $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



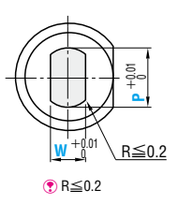
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



- P＞W

Hole shape Ⓖ



- R≦0.2
- P＞W

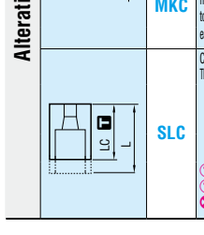
—Straight—

RoHS

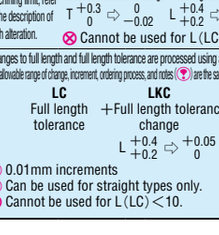
For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WSD Ⓓ WSDD Ⓡ WSDR Ⓔ WSDE Ⓖ WSDG
	D $^{+0.005}_{0}$	Ⓐ A—WSD Ⓓ A—WSDD Ⓡ A—WSDR Ⓔ A—WSDE Ⓖ A—WSDG

Hole shape Ⓐ

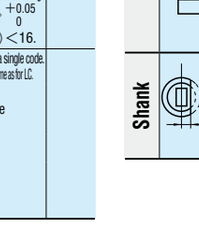


Hole shape Ⓓ



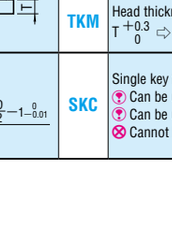
- R≦0.2
- P≧W
- $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



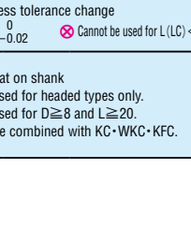
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



- P＞W

Hole shape Ⓖ



- R≦0.2
- P＞W

D tolerance			Catalog No.		L	0.01mm increments				b	d	H	T
						Ⓐ	D R E G		R				
D	m5	n5	Type	D		min. P max.	P・Kmax.	P・Wmin.	R				
3	+0.006 +0.002	+0.008 +0.004	Headed (D_{m5})	Straight (D_{n5})	(3)	0.50～ 1.00	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	2	1.4	4	3
4	+0.009 +0.004	+0.013 +0.008	WHD	WSD	(4)	0.50～ 1.50	—	—			2.0	5	
5			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	5
8	+0.012 +0.006	+0.016 +0.010	WHDE	WSDE	8	1.00～ 4.00	4.00	1.00		4	4.4	11	
10			WHDG	WSDG	10	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	+0.015 +0.007	+0.020 +0.012	($D^{+0.005}_{0}$)	($D^{+0.005}_{0}$)	13	3.00～ 8.00	8.00	1.50		8	8.4	16	
16			A—WHD	A—WSD	16	5.00～ 10.00	10.00	2.00			10.6	19	
20	+0.017 +0.008	+0.024 +0.015	A—WHDD	A—WSDD	20	7.00～ 12.00	12.00	2.00			12.6	23	
25			A—WHDR	A—WSDR	25	10.00～ 16.00	16.00	2.00			16.6	28	
			A—WHDE	A—WSDE	(30)								
			A—WHDG	A—WSDG	(35)								

Ⓡ D=(3),(4), and (5)are specifications available for shape Ⓐ(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.

Order

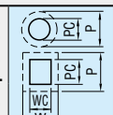
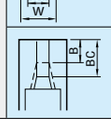
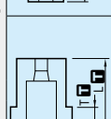
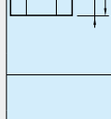
Catalog No.	L	P	W	R(Ⓡ only)
WHDR 13	25	P6.50	W4.00	R1.00

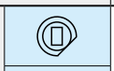
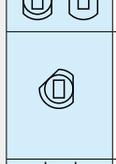
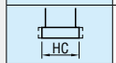
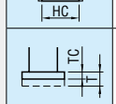
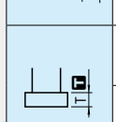
Days to Ship **Quotation**

Price **Quotation**

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	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin.}{2} \geqq 1.00$ 0.01mm increments max.: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax. + 0.2$ 0.01mm increments		
		BC	Shaped hole depth change $1 \leqq BC \leqq b$ 0.1mm increments Ⓡ For Ⓐ only, $1 \leqq BC \leqq 4$ if PC1.00～1.99.		
Alterations to full length		LC	Full length change $10 \leqq L-(b-1) \leqq LC < L$ 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Ⓡ b dimension is shortened by (L—LC). Full length change $8 \leqq LC < L$ 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		Quotation
		LKC	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)＜10.		
		LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)＜10.		
		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 T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		MKC	TKM: Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ 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 (Ⓡ) are the same as for LC. LC: Full length tolerance + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓡ 0.01mm increments Ⓡ Can be used for straight types only. ⊗ Cannot be used for L(LC)＜10.		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
			Addition of single key flat ⊗ Cannot be used for D3～5.	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	Double key flats at 0° and a selected angle 1° increments	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	Head diameter change D≦HC＜H 0.1mm increments		
		TC	Head thickness change 2≦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 $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)＜16.		
Shank		SKC	Single key flat on shank Ⓡ Can be used for headed types only. Ⓡ Can be used for D≧8 and L≧20. ⊗ Cannot be combined with KC・WKC・KFC.		

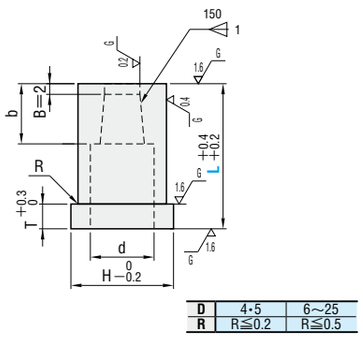
SCRAP RETENTION CARBIDE BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1619

—Headed— RoHS

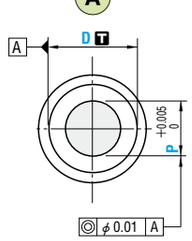
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ SR—WHD Ⓓ SR—WHDD Ⓡ SR—WHDR Ⓔ SR—WHDE Ⓖ SR—WHDG
	D $^{+0.005}_{0}$	Ⓐ SRA—WHD Ⓓ SRA—WHDD Ⓡ SRA—WHDR Ⓔ SRA—WHDE Ⓖ SRA—WHDG

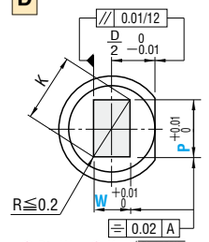


D	4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ

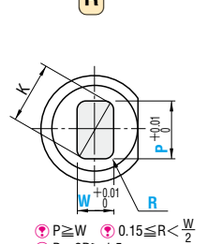


Hole shape Ⓓ



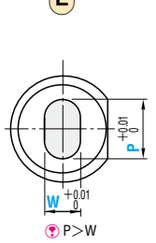
Ⓟ P≧W Ⓟ K=$\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



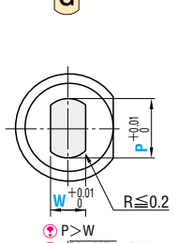
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



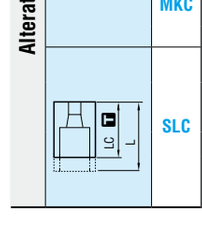
Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

—Straight— RoHS

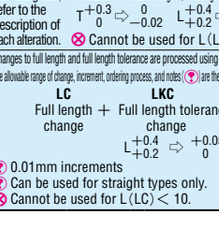
For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ SR—WSD Ⓓ SR—WSDD Ⓡ SR—WSDR Ⓔ SR—WSDE Ⓖ SR—WSDG
	D $^{+0.005}_{0}$	Ⓐ SRA—WSD Ⓓ SRA—WSDD Ⓡ SRA—WSDR Ⓔ SRA—WSDE Ⓖ SRA—WSDG

Hole shape Ⓐ

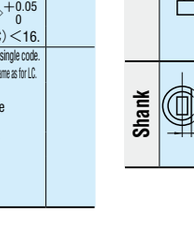


Hole shape Ⓓ



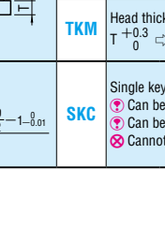
Ⓟ P≧W Ⓟ K=$\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



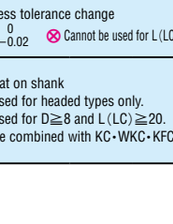
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

D tolerance			Catalog No.		L	0.01mm increments					0.005mm increments	b	d	H	T
						Ⓐ	D R E G		Ⓡ	MT (workpiece material thickness)	C (clearance)				
D	m5	n5	Type	D		min. P max.	P・Kmax.	P・Wmin.	R						
4	+0.009 +0.004	+0.013 +0.008	Headed (D_{m5}) SR—WHD	Straight (D_{n5}) SR—WSD	(4)	1.00～ 1.50	—	—	0.15≦R< $\frac{W}{2}$ (Ⓡ 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			SR—WHD	SR—WSD	(5)	1.00～ 2.50	—	—					3.0	6	
6			SR—WHDD	SR—WSDD	6	1.00～ 3.00	3.00	1.00				3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	SR—WHDR	SR—WSDR	8	1.00～ 4.00	4.00	1.00				4	4.4	11	
10			SR—WHDE	SR—WSDE	10	2.00～ 6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007	+0.020 +0.012	SR—WHDG	SR—WSDG	13	3.00～ 8.00	8.00	1.50				8	8.4	16	
16			($D^{+0.005}_{0}$) SRA—WHD	($D^{+0.005}_{0}$) SRA—WSD	16	5.00～ 10.00	10.00	2.00					10.6	19	
20	+0.017 +0.008	+0.024 +0.015	SRA—WHDD	SRA—WSDD	20	7.00～ 12.00	12.00	2.00					12.6	23	
25			SRA—WHDR	SRA—WSDR	25	10.00～ 16.00	16.00	2.00					16.6	28	
			SRA—WHDE	SRA—WSDE											
			SRA—WHDG	SRA—WSDG											

Ⓟ D＝(4) and (5) are specifications available for shape Ⓐ (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. Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120kgf/mm²).
Ⓟ 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.

Order

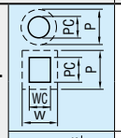
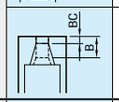
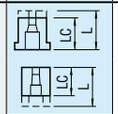
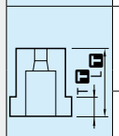
Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—WHDR 13	25	P6.50	W4.00	R1.00	MT1.50	C0.105

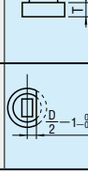
Days to Ship **Quotation**

Price **Quotation**

Alterations

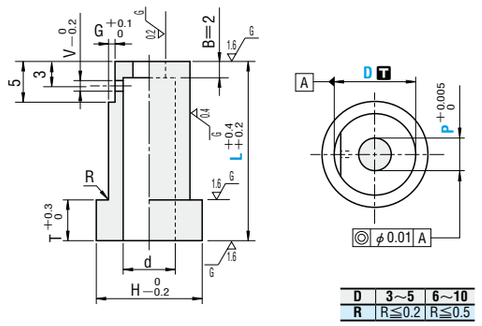
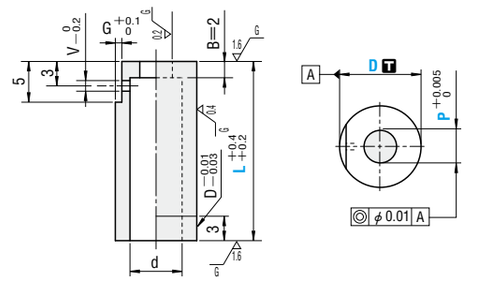
Catalog No.	L (LC・SLC)	P (PC)	W (WC)	R	MT	C	(BC・HC・TC・CKC・MKC, etc.)
SR—WHDD 10	25	P5.00	W3.20		MT1.50	C0.105	TC3.0—TKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01mm increments ⊗Cannot be combined with BC. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		
		BC	Shaped hole depth change 1≦BC<2 0.1mm increments		
Alterations to full length		LC	Full length change 10≦L−(b−1)≦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). Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		Quotation
		LKC	Full length tolerance change ⊗Cannot be used for L(LC)<10.	$L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change ⊗Cannot be used for L(LC)<10.	$L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$	
		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.	TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗Cannot be used for L(LC)<16.	
		MKC		TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗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 (Ⓟ) are the same as for LC.	LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓟ 0.01mm increments Ⓟ Can be used for straight types only. ⊗Cannot be used for L(LC)< 10.	

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position 0°change 1° increments	Quotation
			Addition of single key flat ⊗Cannot be used for D4・5.	Key flat position 0° 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 ⊗Cannot be used for straight types. ⊗Cannot be used for L(LC)<16. ⊗Cannot be combined with KC・WKC.	
		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・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 $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗Cannot be used for L(LC)<16.		
Shank		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—

PRODUCTS DATA P.1621
RELATED PRODUCTS P.385

Type	M H	Shank diameter D T tolerance	Catalog No.	Shape
—Headed— RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{m5}	SV—WHD	
		D $^{+0.005}_{0}$	SVA—WHD	
—Straight— RoHS For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{n5}	SV—WSD	
		D $^{+0.005}_{0}$	SVA—WSD	

D	R
3～5	R≦0.2
6～10	R≦0.5

D tolerance			Catalog No.			L	0.01mm increments	V	G	d	H	T
D	m5	n5	Type		D		min. P max.					
3	+0.006 +0.002	+0.008 +0.004	Headed (D_{m5}) SV—WHD	Straight (D_{n5}) SV—WSD	3	13	0.50～1.00	0.4	0.2	1.4	4	3
4	+0.009 +0.004	+0.013 +0.008			4	16	0.50～1.50			2.0	5	
5					5	20	0.50～2.50			3.0	6	
6			($D^{+0.005}_{0}$) SVA—WHD	($D^{+0.005}_{0}$) SVA—WSD	6	22	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010			8	25	1.00～4.00			4.4	11	
10					10		2.00～6.00			6.4	13	

Order

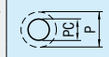
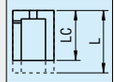
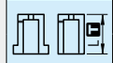
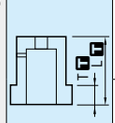
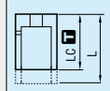
Catalog No.	L	P
SV—WHD10	25	P4.50

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

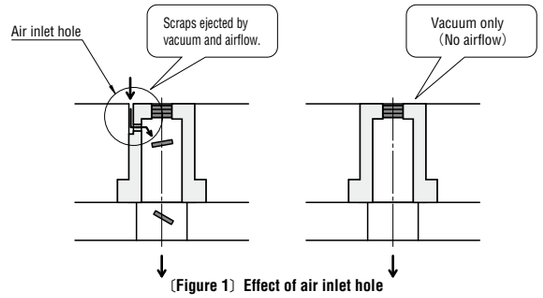
Alteration		Code	Spec.	1Code
Alterations to shaped hole		PC	Shaped hole diameter change min.: P>PC≧ $\frac{Pmin.}{2}$ ≧1.00 0.01mm increments max.: P<PC≦Pmax.+0.2 0.01mm increments	
Alterations to full length		LC	Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Press-in lead is shortened by (L—LC). ⊗ Cannot be used for headed types.	
		LKC	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<10.	Quotation
		LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		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 T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)< 16.	
		MKC	TKM: Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ 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 (Ⓨ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓨ 0.01mm increments Ⓨ Can be used for straight types only. ⊗ Cannot be used for L(LC)<10.	

Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head	Quotation
			Addition of single key flat ⊗ Cannot be used for D3～5.	
		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 angle 1° 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≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦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 $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.	

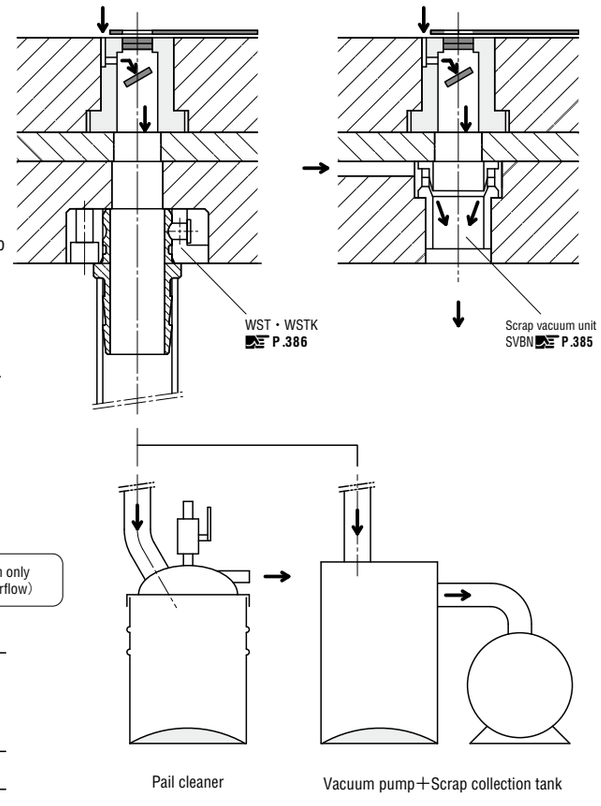
Example

■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.385) 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.1621



〔Figure 1〕 Effect of air inlet hole



〔Figure 2〕 Examples of Combinations with Various Vacuum Devices

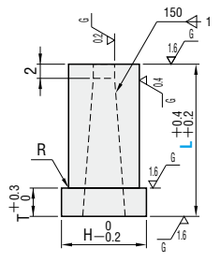
CARBIDE ANGULAR BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

—Headed—

RoHS

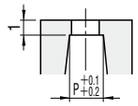
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WAHD Ⓓ WAHDD Ⓡ WAHDR Ⓔ WAHDE Ⓖ WAHDG
	D $^{+0.005}_{0}$	Ⓐ A—WAHD Ⓓ A—WAHDD Ⓡ A—WAHDR Ⓔ A—WAHDE Ⓖ A—WAHDG



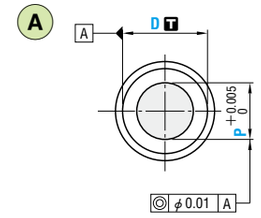
For D2・2.5・3・4・5, the relief taper is 1/50.

P=0.30～0.49
Enlarged view of die end

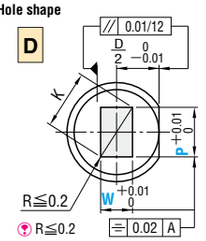


D	2・2.5・3・4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ

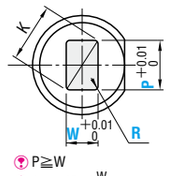


Hole shape Ⓓ



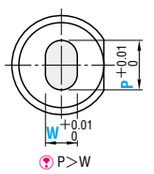
R≦0.2
P≧W
K=$\sqrt{P^2+W^2}$

Hole shape Ⓡ



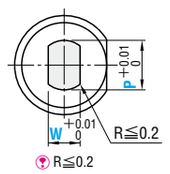
P≧W
0.15≦R＜$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



P＞W

Hole shape Ⓖ



R≦0.2
P＞W

—Straight—

RoHS

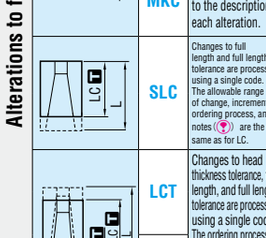
For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WASD Ⓓ WASDD Ⓡ WASDR Ⓔ WASDE Ⓖ WASDG
	D $^{+0.005}_{0}$	Ⓐ A—WASD Ⓓ A—WASDD Ⓡ A—WASDR Ⓔ A—WASDE Ⓖ A—WASDG

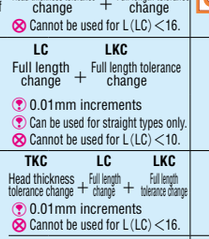
For D2・2.5・3・4・5, the relief taper is 1/50.

P=0.30～0.49
Enlarged view of die end

Hole shape Ⓐ

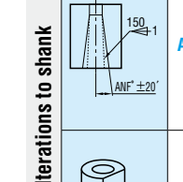


Hole shape Ⓓ



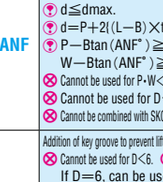
R≦0.2
P≧W
K=$\sqrt{P^2+W^2}$

Hole shape Ⓡ



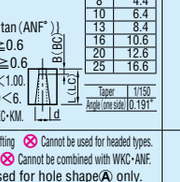
P≧W
0.15≦R＜$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



P＞W

Hole shape Ⓖ



R≦0.2
P＞W

D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R R	H	T
2	+0.006 +0.002	+0.008 +0.004	Headed (D_{m5}) WAHD	(2)	10	0.30～ 0.49	—	—	—	3	3
2.5			WAHDD	(2.5)	13	0.30～ 0.49	—	—		3.5	
3			WAHDR	(3)	16	0.30～ 0.49	—	—		4	
3			WAHDE	(3)	13	0.50～ 1.00	—	—		4	
4			WAHDG	(4)	16	0.50～ 1.50	—	—		5	
5	+0.009 +0.004	+0.013 +0.008	Straight (D_{n5}) WASD	(5)		0.50～ 2.50	—	—		6	
6			WASDD	6	20	1.00～ 3.00	3.00	1.00	0.15≦R＜$\frac{W}{2}$ (Ⓡ only)	9	5
8	+0.012 +0.006	+0.016 +0.010	WASDR ($D^{+0.005}_{0}$) A—WAHD	8	22	1.00～ 4.00	4.00	1.00		11	
10			WASDE A—WAHDD	10	25	2.00～ 6.00	6.00	1.20		13	
13	+0.015 +0.007	+0.020 +0.012	WASDG A—WAHDR	13	(30)	3.00～ 8.00	8.00	1.50		16	
16			($D^{+0.005}_{0}$) A—WAHDE	16	(35)	5.00～ 10.00	10.00	2.00		19	
20	+0.017 +0.008	+0.024 +0.015	A—WASD A—WAHDG	20		7.00～ 12.00	12.00	2.00		23	
25			A—WASDD	25		10.00～ 16.00	16.00	2.00		28	

Ⓟ D=(2)(2.5)(3)(4)(5) are specifications available for shape Ⓐ(round) only. They are not available for shapes DREG.
Ⓟ If P is 0.30～0.49, full length is either of L10・13・16. Ⓟ L(30)・(35) ··· D8～25 Full length(30)・(35) are specifications available for D8～25 only.

Order

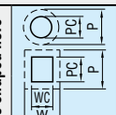
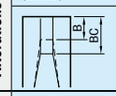
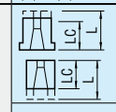
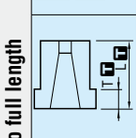
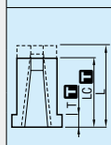
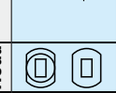
Catalog No.	L	P	W	R(Ⓡ only)
WAHDR 13	25	P6.50	W4.00	R1.00

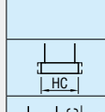
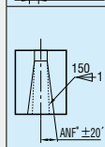
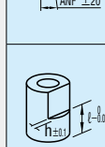
Days to Ship Quotation

Price Quotation

Alterations

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

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01mm increments max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		
		BC	Shaped hole depth change 1≦BC≦4 0.1mm increments ⊗ Cannot be used for P0.30～0.49.		
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Ⓟ If P=0.30～0.49, 7≦LC≦16. 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 $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		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 + LKC Full length tolerance change ⊗ Cannot be used for L(LC)＜16.	Quotation
		MKC		TKM Head thickness tolerance change + LKC 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 Full length change + LKC 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 Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)＜16.	
		LMT		TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)＜16.	
Head		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	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head Addition of single key flat ⊗ Cannot be used for D5 or less.	Key flat position change 1° increments Key flat position change 1° increments	Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments	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	Head diameter change D≦HC＜H 0.1mm increments		
		TC	Head thickness change 2≦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 $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)＜16.		
Alterations to shank		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≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2((L—B)×tan(ANF°)) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used for P・W＜1.00 ⊗ Cannot be used for D＜6. ⊗ Cannot be combined with SKC・KM.	D / dmax.: 6 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 16.6 Taper 1/150; Angle (one side) 0.191°	
		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. If D=6, can be used for hole shape Ⓐ only.	D / h / ℓ: 6 1; 8; 10; 13; 16 1.5; 20; 25 2; 5≦ℓ＜L 0.1mm increments Ⓟ KM machining adds key flats in symmetrically opposite positions.	

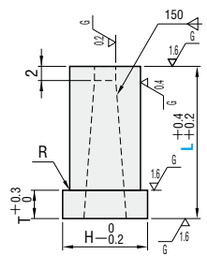
SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1619

—Headed— RoHS

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

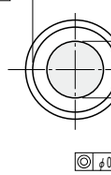
M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ SR—WAHD Ⓓ SR—WAHDD Ⓡ SR—WAHDR Ⓔ SR—WAHDE Ⓖ SR—WAHDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WAHD Ⓓ SRA—WAHDD Ⓡ SRA—WAHDR Ⓔ SRA—WAHDE Ⓖ SRA—WAHDG



For D4・5, relief taper is 1/50.

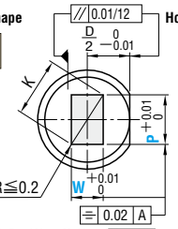
D	4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ



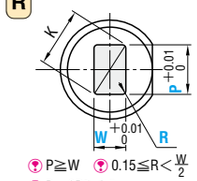
P≧W P−0.4≧1.5

Hole shape Ⓓ



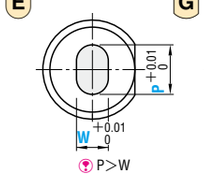
P≧W K=√(P²+W²) P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



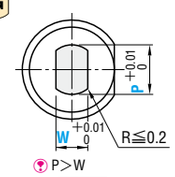
P≧W 0.15≦R<W/2 P−2R≧1.5 (P dimension straight section 1.5 mm or longer) K=√(P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



P>W

Hole shape Ⓖ



P>W √(P²−W²)≧1.5 (P dimension straight section 1.5 mm or longer)

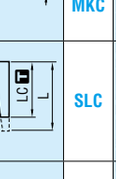
—Straight— RoHS

For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ SR—WASD Ⓓ SR—WASDD Ⓡ SR—WASDR Ⓔ SR—WASDE Ⓖ SR—WASDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WASD Ⓓ SRA—WASDD Ⓡ SRA—WASDR Ⓔ SRA—WASDE Ⓖ SRA—WASDG

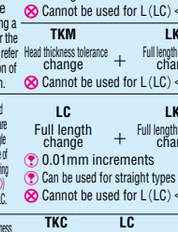
For D4・5, relief taper is 1/50.

Hole shape Ⓐ



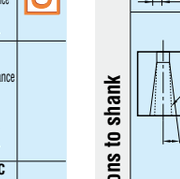
P≧W P−0.4≧1.5

Hole shape Ⓓ



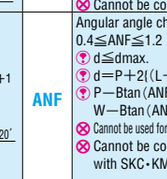
P≧W K=√(P²+W²) P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



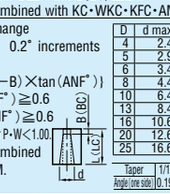
P≧W 0.15≦R<W/2 P−2R≧1.5 (P dimension straight section 1.5 mm or longer) K=√(P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



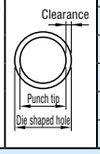
P>W

Hole shape Ⓖ



P>W √(P²−W²)≧1.5 (P dimension straight section 1.5 mm or longer)

D tolerance D	m5	n5	Catalog No. Type	Straight	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	Ⓡ R	MT (workpiece material thickness)	0.005mm increments C (clearance)	H	T
4			Headed (Dm5)	Straight (Dn5)	(4)		1.00～ 1.50	—	—				5	
5	+0.009 +0.004	+0.013 +0.008	SR—WAHD	SR—WASD	(5)	13	1.00～ 2.50	—	—				6	3
6			SR—WAHDD	SR—WASDD	6	16	1.00～ 3.00	3.00	1.00				9	
			SR—WAHDR	SR—WASDR										
8	+0.012	+0.016	SR—WAHDE	SR—WASDE	8	20	1.00～ 4.00	4.00	1.00				11	
10	+0.006	+0.010	SR—WAHDG	SR—WASDG	10	22	2.00～ 6.00	6.00	1.20				13	
13	+0.015	+0.020	($D^{+0.005}_{0}$)	($D^{+0.005}_{0}$)	13	25	3.00～ 8.00	8.00	1.50				16	5
16	+0.007	+0.012	SRA—WAHD	SRA—WASD	(30)		5.00～ 10.00	10.00	2.00				19	
			SRA—WAHDD	SRA—WASDD										
20	+0.017	+0.024	SRA—WAHDR	SRA—WASDR	20	(35)	7.00～ 12.00	12.00	2.00	0.15≦R<W/2 (Ⓡ 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.	23	
25	+0.008	+0.015	SRA—WAHDE	SRA—WASDE	25		10.00～ 16.00	16.00	2.00				28	
			SRA—WAHDG	SRA—WASDG										



Ⓟ D(4) and (5) are specifications available for shape Ⓐ (round) only. They are not available for shapes Ⓓ Ⓡ Ⓔ Ⓖ.

Ⓟ L(30)・(35) ···› D8～25 Full length (30)・(35) are specifications available for D8～25 only. Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm²(120kgf/mm²).

Ⓟ 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.

Order

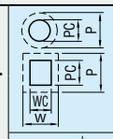
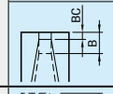
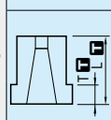
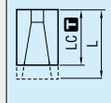
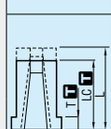
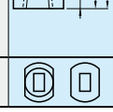
Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—WAHDR 13	25	P6.50	W4.00	R1.00	MT1.50	C0.105

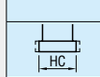
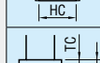
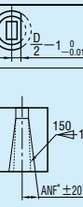
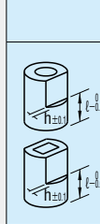
Days to Ship Quotation

Price Quotation

Alterations

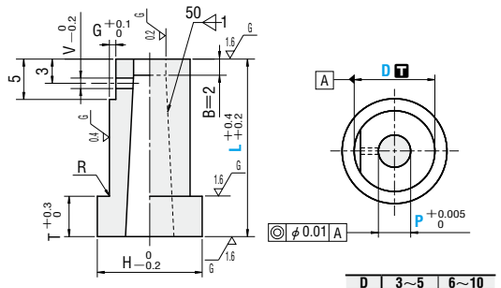
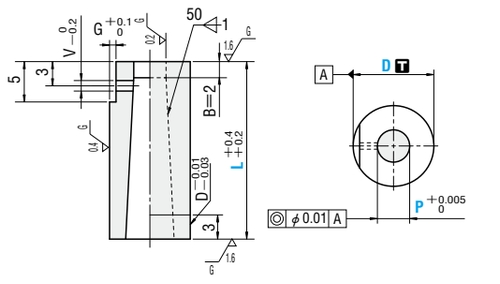
Catalog No.	L (LC・SLC・LCT・LMT)	P (PC)	W (WC)	R	MT	C	(BC・HC・TC・CKC・MKC, etc.)
SR—WAHDD 10	25	P5.00	W3.20		MT1.50	C0.105	TC3.0—TKC

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01mm increments max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		
		BC	Shaped hole depth change 1≦BC<2 0.1mm increments		
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) 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 $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<16.		Quotation
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		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 + LKC Full length tolerance change ⊗ Cannot be used for L(LC)<16.	
		MKC		TKM Head thickness tolerance change + LKC 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 Full length change + LKC 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 Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	
		LMT		TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	
Head		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	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to head		KC	Addition of single key flat to head Addition of single key flat ⊗ Cannot be used for D4・5.	Key flat position change 1° increments 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≦HC<H 0.1mm increments		
		TC	Head thickness change 2≦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 $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.		Quotation
		TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.		
Alterations to shank		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.		Quotation
		ANF	Angular angle change 0.4≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2{(L—B)×tan(ANF°)} Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used for P・W<1.00. ⊗ Cannot be combined with SKC・KM.	D / d max.: 4 2.4; 5 2.9; 6 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 16.6 Taper Angle (one side) 1/150 0.191°	
		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. If D=6, can be used for hole shape Ⓐ only.	D / h / ℓ: 6 1; 8; 10; 13; 16 1.5; 20; 25 2; 5≦ℓ<L 0.1mm increments Ⓟ KM machining adds key flats in symmetrically opposite positions.	

NON-CLOGGING CARBIDE ANGULAR BUTTON DIES WITH AIR HOLES
—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1621
RELATED PRODUCTS P.385

Type	M H	Shank diameter D T tolerance	Catalog No.	Shape
—Headed— RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{m5}	SV—WAHD	
		D $^{+0.005}_{0}$	SVA—WAHD	
—Straight— RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{n5}	SV—WASD	
		D $^{+0.005}_{0}$	SVA—WASD	

D	R
3～5	R≦0.2
6～10	R≦0.5

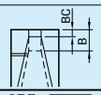
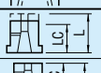
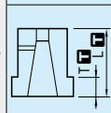
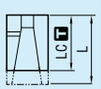
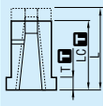
D tolerance			Catalog No.			L	0.01mm increments	V	G	H	T
D	m5	n5	Type		D		min. P max.				
3	$^{+0.006}_{+0.002}$	$^{+0.008}_{+0.004}$	Headed (D_{m5}) SV—WAHD	Straight (D_{n5}) SV—WASD	3	13	0.50～1.00	0.4	0.2	4	3
4	$^{+0.009}_{+0.004}$	$^{+0.013}_{+0.008}$			4	16	0.50～1.50			5	
5					5	20	0.50～2.50			6	
6			($D^{+0.005}_{0}$) SVA—WAHD	($D^{+0.005}_{0}$) SVA—WASD	6	22	1.00～3.00	0.8	0.3	9	5
8	$^{+0.012}_{+0.006}$	$^{+0.016}_{+0.010}$			8	25	1.00～4.00			11	
10					10		2.00～6.00			13	

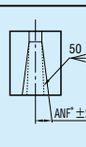
Order: Catalog No. — L — P
SV—WAHD10 — 25 — P4.50

Days to Ship: Quotation

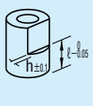
Price: Quotation

Alterations: Catalog No. — L(LC・SLC・LCT・LMT) — P(PC) — (BC・HC・TC・CKC・MKC, etc.)
SV—WAHD10 — LC18 — PC1.80 — TKC — ANF1.0

Alteration		Code	Spec.	1Code
Alterations to shaped hole		PC	Shaped hole diameter change min.: P>PC≧ Pmin./2 ≧1.00 0.01mm increments max.: P<PC≦Pmax.+0.2 0.01mm increments	
		BC	Shaped hole depth change 1≦BC<2 0.1mm increments	
Alterations to full length		LC	Full length change 13≦LC<L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) 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 L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<16.	Quotation
		LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		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 + LKC Full length tolerance change ⊗ Cannot be used for L(LC)<16.	
		MKC	TKM Head thickness tolerance change + LKC 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 Full length change + LKC 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 Head thickness tolerance change + LC Full length change + LKC Full length tolerance change ♆ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	
		LMT	TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change ♆ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	

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	270° 180° 90° 0° 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≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦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 $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.	
Alterations to shank		ANF	Angular angle change 0.2≦ANF≦1.2 0.2° increments ♆ d≦dmax. ♆ d=P+2{(L—B)×tan(ANF°)} ♆ P—Btan(ANF°)≧0.6 ⊗ Cannot be used for P<1.00. ⊗ Cannot be combined with KM. ANF°±20° B(BC) L(LC) d Taper 1/50 Angle/one side 0.573°	

D	d max.
3	2.0
4	2.4
5	2.9
6	3.4
8	4.4
10	6.4

		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.	

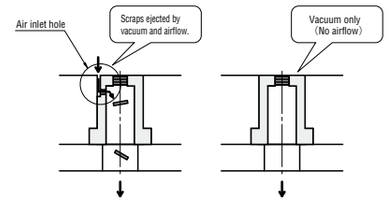
D	h	ℓ
6	1	5≦ℓ<L 0.1mm increments
8 10	1.5	

♆ KM is machined in a position symmetrically opposite the air inlet.

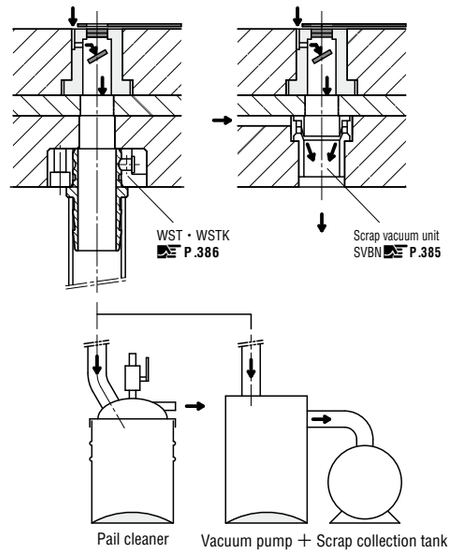
Example

■ 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.385) 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.1621



〔Figure 1〕Effect of air inlet hole



〔Figure 2〕Examples of Combinations with Various Vacuum Devices

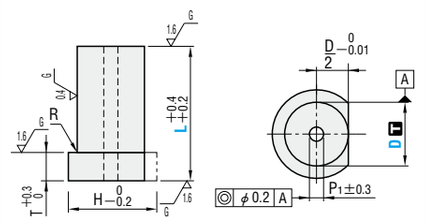
CARBIDE BUTTON DIE BLANKS
—HEADED・STRAIGHT—

—Headed—

RoHS

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	WAHD—B
	$D\ ^{+0.005}_{0}$	A—WAHD—B



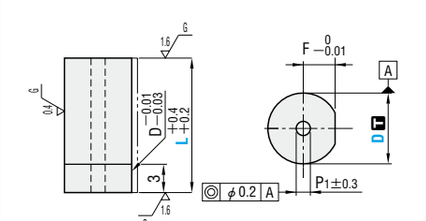
D	3・4・5	6～25
R	6～25	R≦0.5

—Straight—

RoHS

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	WASD—B
	$D\ ^{+0.005}_{0}$	A—WASD—B



Catalog No. Type	D	L	P_1	F	H	T	Base unit price 1～4 pieces WAHD—B A—WAHD—B	WASD—B A—WASD—B
Headed (D_{m5}) WAHD—B	3	13	0.7	1.0	4	3	Quotation	
($D^{+0.005}_{0}$) A—WAHD—B	4	16		1.5	5			
	5	20		2.0	6			
	6	22	1.7	2.0	9	5		
	8	25		3.0	11			
	10	(30)		4.0	13			
Straight (D_{n5}) WASD—B	13	(35)		5.5	16			
($D^{+0.005}_{0}$) A—WASD—B	16		2.2	7.0	19			
	20			9.0	23			
	25			11.5	28			

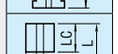
? L(30)・(35) ···· D8～25 Full length L(30)・(35) are specifications available for D8～25 only.

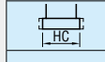
Order — Catalog No. — L
A—WAHD—B 13 — 25

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
		LC	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 L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.	

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 ⊗ 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.) ? Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.	
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.	

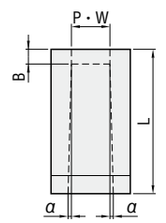
SPACERS
—FOR ANGULAR BUTTON DIES AND STRAIGHT BUTTON DIES WITH RELIEF HOLES —

—For angular button dies—

RoHS

M SK5
H 45HRC～

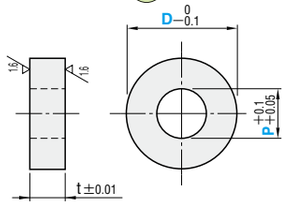
■ Button die L dimension and P・W spread



(α×2) part dimension: Spread of P・W (when B=2) Values in the table below are values for the α part on each side.

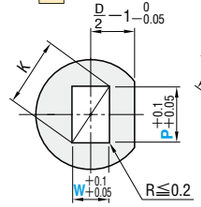
L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22

Hole shape A SSD



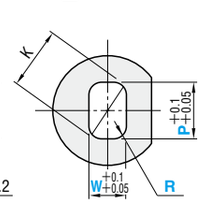
? P≧W
? K=√(P²+W²)

Hole shape D SSDD



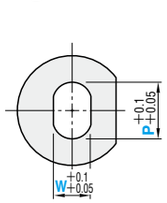
? P≧W
? K=√(P²+W²)

Hole shape R SSDR



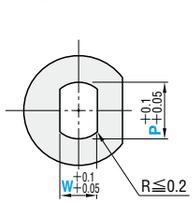
? P≧W
? 0.15≦R< W/2
? K=√((P−2R)²+(W−2R)²)+2R

Hole shape E SSDE



? P>W

Hole shape G SSDG



? P>W

Catalog No. Type	D	0.01mm increments Ⓐ min. P max.	Ⓐ P・Kmax.	Ⓐ P・Wmin.	D R E G R	t	Base unit price (8-piece set) 1～4 sets
Ⓐ SSD	6	1.00～ 4.00	—	—	—	0.05	Quotation
Ⓓ SSDD	8	1.00～ 5.00	5.00	1.00	R only 0.15≦R< W/2	0.1	
Ⓡ SSDR	10	2.00～ 7.00	7.00	1.20		0.2	
Ⓔ SSDE	13	3.00～ 9.00	9.00	1.50		0.3	
Ⓖ SSDG	16	5.00～ 12.00	12.00	2.00		0.5	
	20	7.00～ 16.00	16.00	3.00		1.0	
	22	8.00～ 18.00	18.00	3.00		1.5	
	25	10.00～ 20.00	20.00	3.00		2.0	

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

Order — Catalog No. — P — W — 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	Ⓐ	D R E G	1Code
Head		KC	Addition of single key flat	Key flat position change 1° increments	Quotation

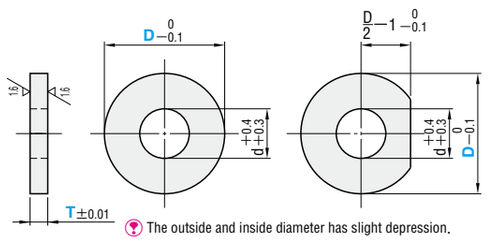
—For straight button die with relief holes—

RoHS

M SK5
H 45HRC～

Hole shape Ⓐ SSDN

Hole shape D R E G SSDHN



? The outside and inside diameter has slight depression.

d	Catalog No. Type	D	T	Base unit price (5-piece set) 1～9 sets T0.05	T0.1	T0.2	T0.5	T1.0
3.4	SSDN (for round die D6～25) SSDHN (for shaped die D8～25)	6	0.05 0.1 0.2 0.5 1.0	Quotation				
4.4		8						
6.4		10						
8.4		13						
10.6		16						
12.6		20						
14.6		22						
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