MiSUMi



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MISUMI MALAYSIA SDN BHD

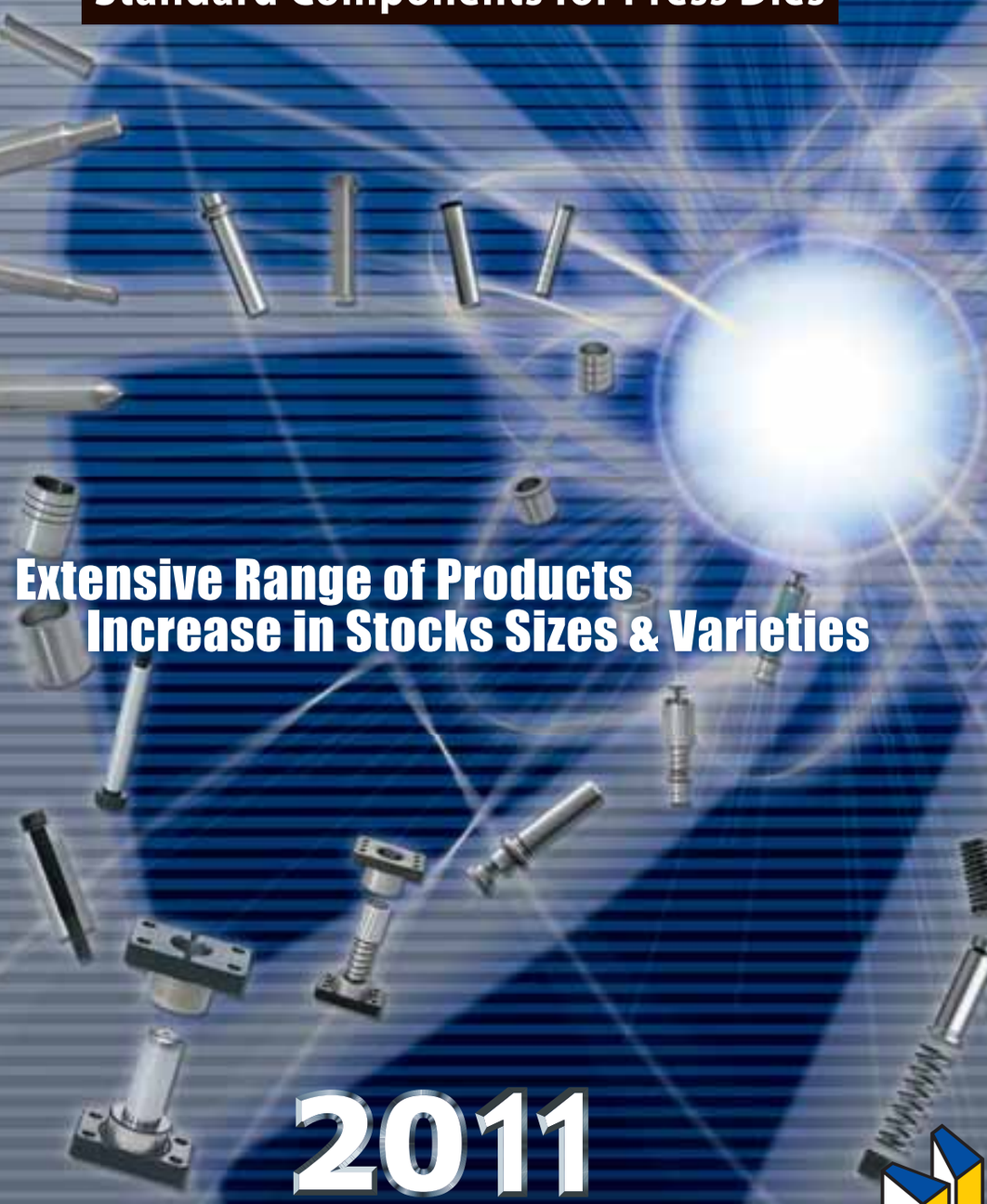
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MiSUMi

Standard Components for Press Dies 2011 Volume 1

MiSUMi

Standard Components for Press Dies



Extensive Range of Products
Increase in Stocks Sizes & Varieties

2011
Volume 1

MiSUMi

COMPONENTS HIGHLIGHT

WIDE RANGE of TOP QUALITY PRESS DIES STANDARD COMPONENTS

Delivery Shorten!



Stripper Guide Pins & Bushings
CODE: SGOH SGPH SGON SGPN VGPH VGHZ SGBH SGBL SGBT SGBA SGBF SGHZ SGBZ SGFZ SGHM SGBBF SGBBS etc.
P.1~26



Punches & Pilot Punches
CODE: SPAL SJAL SPAL-C SPC SHB SPB SPT etc.
P.65~76



Button Dies
CODE: EMHD EMSD
P.77~80

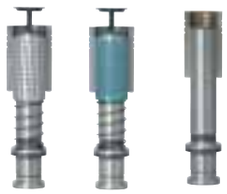
Additional 300 Stock Items
Total 2400 Items in Stock now



Guide Posts
CODE: BRPM BSPK BSPM MRP MSP etc.
P.39~42



Guide Bushings
CODE: LBB RBB LBBS LDB LDBZ MBS etc.
P.43~50



Guide Posts Sets
CODE: QM RM RD PD QBSH RMSH etc.
P.31~38



Holder Guide Post Sets
CODE: MYP MY MYZ MYZP N-MYP N-MYZP MYA MYAP MYJ MYJP MYAK etc.
P.55~64



Guide Lifters / Lifter Pin Sets
CODE: GLH GLK GLP GLS LPS LPSH etc.
P.95~98



Components
CODE: MSB MSW MS SRW T FGSM WSS HX HXH MGN etc.
P.51, 81~94



Springs
CODE: WY WR WF WL WT WM WH SWY SWU SWR SWS SWF SWL SWM SWH SWB SWG SGC
P. 99~128

Product information are also available on our website.

Visit www.my.misumi-ec.com (MISUMI MALAYSIA) or www.sg.misumi-ec.com (MISUMI SOUTH EAST ASIA)

*Warehouse is located in Singapore.

Standard Components for Press Dies Product Lineup



PUNCHES
P.65~



PILOT PUNCHES
P.75~



PUNCH GUIDE BUSHINGS



BUTTON DIES
P.77~



BLOCK PUNCHES



BLOCK DIES



PRECISION PUNCHES & DIES



CARBIDE PUNCHES



CARBIDE PILOT PUNCHES



CARBIDE BUTTON DIES



CARBIDE BLOCK PUNCHES



CARBIDE BLOCK DIES



RELATED COMPONENTS FOR MISFEED SENSORS



PUNCHES & DIES FOR FORMING



SPECIAL SHAPED PUNCHES & DIES



RETAINERS



BALL-LOCK PUNCHES & DIES/RETAINERS



COMPONENTS
P.81~



GUIDE LIFTERS
P.95~



STRIPPER GUIDE PINS & BUSHINGS
P.1~



GUIDE POSTS & BUSHINGS FOR DIE SET
P.27~



HOLDER GUIDE POST SETS
P.53~



GUIDING COMPONENTS FOR AUTOMOBILE DIE



COMPONENTS FOR AUTOMOBILE DIE



LOCATING COMPONENTS FOR AUTOMOBILE DIE



COMPONENTS FOR TRANSFER DIE



OIL-FREE SLIDE PLATES



COMPONENTS OF CAMS



COIL SPRINGS
P.99~



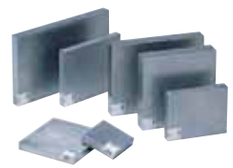
GAS SPRINGS



URETHANE SPRINGS



COMPONENTS FOR LIFTING/DIE STORING



FINISHED PLATES·FINISHED BLOCKS



JIGS & FIXTURES SERIES FOR INSPECTION

How to Start Business with MiSUMi

How to Order

For New Customers
Fill out the Customer Registration Form and send it to the Customer Service Department either by fax or e-mail. You will receive your customer code once the registration procedure is completed.

For Existing Customers
1. Send in your inquiry with the details of your order (Misumi part no. & Quantity) together with your company details to our Customer Service by fax or e-mail.
2. Our Customer Service will send you the quotation.
3. After confirmation of the price and delivery date, please send in the Official PO.

*For customers without credit terms, payment is to be made after PO confirmation.

Delivery

Destination	Singapore	Malaysia	Other Countries
Non-stock	Delivery as shown on each page	+ 2 days	Depends on your courier service
Stock	1 day	+ 2 days	

- Time of delivery stipulated in catalog might delay in case of stock shortage and/or required
- Order received after 3pm will be treated as next working day order.
- Warehouse is located at Tuas, Singapore.

About Express Delivery Services

This system shortens the production time so that your order can be shipped out faster.

- To meet your urgent orders, we offer expedited services for many products. Our Express Delivery Services are available for the products marked with one of the symbols below.
  Depending on the specifications / dimensions of a product, the services may not be available. Before placing an order, please confirm the service availability indicated on the product pages.

Express **T** Express **A** Express **B** Express **C**

Special Emergency Service [Express T]

- **[Express T]** is a special emergency service that allows orders to be shipped out after 2business days of your order.
- Please note that this service might not be available depending on the order volume.

Reception Time of Emergency Service System [Express]

- Request for Express Services must be received before the following dead line.
  From 9:00 a.m. to 10:00 a.m. fo **[Express T]**, by 3:00 p.m. for **[Express A]** and by 5:00 p.m. for **[Express B and C]**.
  Please note that orders placed after the above timings will be treated as next day orders.

Emergency System	Express **T**	Express **A**	Express **B**	Express **C**
Orders Received	**By 10:00 a.m.**	**By 3:00 p.m.**	**By 5:00 p.m.**	
Shipped Out	After 2 Business Days of Your Order	After 3 Business Days of Your Order	After 5 Business Days of Your Order	After 7 Business Days of Your Order

- **[Express T]** orders must be placed by 10:00 a.m. Please use **[Express A]** (After 3 Business days of your order) after 10:00 a.m.
- Changes or cancellation after ordering of **[Express T]** will not be accepted. Changes or cancellation of Express A, B and C varies depending on the time.
- "Shipped out", "Shipment" denotes the required actual business days before the product is shipped.
- Please note that the actual delivery may vary depending on your location. Please consult your local Misumi office for expected arrival dates.
  Please note that above delivery days are subject to change depending on the order volume.

The above conditions only applicable to Singapore area. Please contact our subsidiary in your country for details.

Express Delivery Fee
- Kindly contact our customer service for the express delivery charges for your country.

Changing or Canceling Orders

Changing or canceling orders (the Cancellation) is treated according to the shipment date and the timing when you make the cancellation. Cancellation charges will be imposed in some cases. Please contact our subsidiary in your country for details.

- Items with 3 Days logo

  No cancellation is accepted.

- Items with 4 Days logo or logo shows longer days

  Please refer to the table of the cancellation and shipment date below. Cancellation is acceptable with or without charges (40% of product cost) depending on the timing of the cancellation.
  Please contact our subsidiary in your country for details.

- Table of Cancellation and Shipment date

Days from the Day of Ordering \ Catalogue Delivery Schedule and Service	3 Days Catalog Item	4 Days Catalog Item	5 Days Catalog Item	6 Days Catalog Item	7 Days Catalog Item	8 Days Catalog Item	9 Days Catalog Item	12 Days Catalog Item	14 Days Catalog Item	16 Days Catalog Item	18 Days Catalog Item	22 Days Catalog Item	Express T	Express A	Express B	Express C
Day of Ordering	×	△	○	○	○	○	○	○	○	○	○	○	×	△	○	○
1 Days Later	×	×	△	△	○	○	○	○	○	○	○	○	×	×	△	○
2 Days Later	×	×	×	△	△	△	△	○	○	○	○	○	Shipment Date	×	×	△
3 Days Later	Shipment Date	×	×	×	△	△	△	○	○	○	○	○		Shipment Date	×	△
4 Days Later		Shipment Date	×	×	×	△	△	△	○	○	○	○			×	×
5 Days Later			Shipment Date	×	×	×	△	△	△	△	○	○			Shipment Date	×
6 Days Later				Shipment Date	×	×	×	△	△	△	△	○				×
7 Days Later					Shipment Date	×	×	△	△	△	△	△				Shipment Date
8 Days Later						Shipment Date	×	△	△	△	△	△				
9 Days Later							Shipment Date	×	△	△	△	△				
10 Days Later								×	△	△	△	△				
11 Days Later								×	×	△	△	△				
12 Days Later								Shipment Date	×	△	△	△				
13 Days Later									×	×	△	△				
14 Days Later									Shipment Date	×	△	△				
15 Days Later										×	×	△				
16 Days Later										Shipment Date	×	△				
17 Days Later											×	△				
18 Days Later											Shipment Date	△				
19 Days Later												×				
20 Days Later												×				
21 Days Later												×				
22 Days Later												Shipment Date				

○: Cancellation without charge. △: 40% of product cost is imposed on the cancellation. ×: No cancellation is accepted.

Please note that some of the Punch & Die products are not available for cancellation depending on the manufacturer condition. Please contact customer service for more information.

Returning and Replacing Goods

- Item with SGP Stock logo can be returned. Administration charges applicable and customer is kindly request to contact our customer service prior making the return.
  Please note that the delivery cost of returning goods to the destination we determined must be paid by the customer.
- Items with 3 Days logo or logo shows longer days, cannot be returned as they have been manufactured-to-order.
- When the received goods differ from the placed order, please contact our subsidiary for the replacement.

Please note that the above returning and replacing of goods are subjected to terms and conditions.

HOW TO USE CATALOG

Product Name

Catalog No.

Materials and others

Photograph

Drawing

Dimension Table

●Select blue characters one by one from the left to find order symbols.

●Dimensions unnecessary to specify for order symbols are covered with blue mesh.

●Printed in red means Stock

How to Order

●Order example

Page number

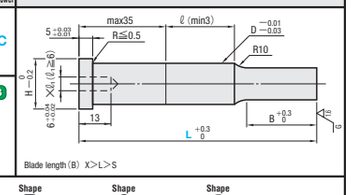
•PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS—

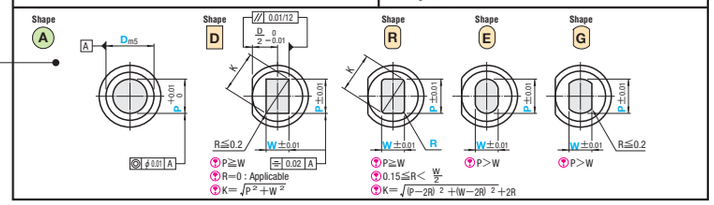
Shear angle alteration	1F	2F	3F	4F	5F	6F	7F

Type	Ⓐ	Shank dia. D T	M H	CatalogNo. Type	Shape	Blade length	With dowel
With dowel	Dowel pin MS6—25	D_{m5}	SKD 11 or equivalent 60～63HRC	SP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L X	—C

RoHS

Select tip shape from shape A～G shown below.





CatalogNo. Type	D	L	0.01mm increments Ⓐ P-Kmax.	P-Wmin.	Ⓡ R	B	H
S SPAS—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	13	13
SPDS—C	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00		16
SPRS—C	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00	19	19
SPES—C	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00		23
SPGS—C	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00		28
	32	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00	19	35
	38	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00		41
	45	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00		48
L SPAL—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	19	13
SPDL—C	13	50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00		16
SPRL—C	16	60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00	25	19
SPEL—C	20	60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00		23
SPGL—C	25	60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00		28
	32	60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00		35
	38	60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00		41
	45	60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00		48
M SPAX—C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00	30	13
SPDX—C	13	70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	5.00		16
SPRX—C	16	80 90 100 110 120 130 140 150	10.00～15.99	—	—	40	19
SPEX—C	20	80 90 100 110 120 130 140 150	13.00～19.99				23
SPGX—C	25	80 90 100 110 120 130 140 150	18.00～24.99				28
	32	80 90 100 110 120 130 140 150	20.00～31.99				35
	38	80 90 100 110 120 130 140 150	28.00～37.99				41
	45	80 90 100 110 120 130 140 150	35.00～44.99				48

0.15≦R< W/2 (@only)

Ⓣ L (40), D10～25→B=8, When L (40) and D (10～25), the blade length is fixed to 8 mm.
L (40), D32～45→B=6, When L (40) and D (32～45), the blade length is fixed to 6 mm.
Ⓣ L (50) →B=13, When L (50), the blade length is fixed to 13mm.
Ⓣ Ⓐ: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓣ Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order: CatalogNo. — L — P — W — R (Ⓡ only)
SPAS—C25 — 100 — P18.05

Example

■Punch with dowel is,
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.



Delivery

- ϕD 10～32 Ⓐ — 5 Days — Express T / Express A — P.i
- ϕD 10～32 Ⓓ Ⓡ Ⓔ Ⓖ — 5 Days — Express T / Express A — P.i
- ϕD 38-45 Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ — 5 Days — Express A — P.i

For area out of Singapore please refer to P.i.

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

Alteration — CatalogNo. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
SPAS—C25 — LC95 — P18.05 — BC30

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	Price
Tip		PC WC	Changes dimension P. PC≧ P-min./2, 0.01mm increments (Combination with PRC−0.01mm increments) P(PC) 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Changes dimension P・W. PC≧ (P・Wmin.)/2, WC≧ (P・Wmin.)/2, 0.01mm increments ⊗Blade length X:Not applicable. P(PC)・W(WC) 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
		BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments, Ⓣ Full L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments, Ⓣ Full L (LC) requires BC+30mm or more.	
		SC	Finishes blade with lapping. Ⓣ Dimension P tolerance and the specification unit remain the same. ⊗ⒹⒺ shape is not applicable with a corner radius of 0.		
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments, Ⓣ PRC≦ (P−0.2)/2, ⊗PCC・GC:Not applicable	——	
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments, Ⓣ PCC≦ (P−0.2)/2, ⊗PRC・GC:Not applicable	——	
		GC	20°≦GC<90°, 1° increments, Blade length B≧f+2, f=P/2×tan (90°−GC°), Ⓣ When used with SC, tip and edge are rounded. ⊗LKC・LKZ・PRC・PCC :Not applicable	——	
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0, Ⓣ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0	
Full length		LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments, Ⓣ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC・LKZ−0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments, Ⓣ When LC−B (BC) is 30mm or less, B (BC) is LC−30mm.	
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		
		LKZ	Changes full length tolerance. ⊗D>25:Not available		
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	Price
Head		KFC	Adds 1 key flat at 0° and the other on another angle. 270° 1° increments, ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 270° 1° increments, ⊗KC・WKC:Not applicable	Quotation
		NKC	——	No key flat. ⊗Punch & retainer set not available.	Free of Charge
		HC	Changes head diameter. D≦HC<H, 0.1mm increments, ⊗Punch & retainer set not applicable.		
		TC	Changes head thickness 2≦TC<5, 0.1mm increments, Ⓣ L is shortened by (5−TC). When LC is combined, L=LC. ⊗Punch & retainer set not available.		
		TCC	Adds Chamfering to head. Strengthen the punch head. 0.1mm increments, 0.5≦TCC≦(H−D)/2, ⊗SRC:Not applicable		
		SRC	Modifies head to fit to select retainers (SLS). Ⓣ D10～32 : Applicable, ⊗Punch & retainer set not available.		
Shank		UC	Modifies shank to fit to urethane stripper (USN). Code U L Applicable USN: UC40 37 L≧80 USN40; UC50 47 L≧90 USN50. Ⓣ P・Kmax.=D−1.1, Applicable to L≧80, L≧90, Ⓣ D10～32 : Applicable		
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗D38・45:Not applicable		
		NDC	No press-in lead ℓ≧3 ⇨ =0 ℓ, ⊗Punch & retainer set not available.		Free of Charge

■Volume discount rate

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

■Ⓜ SKD 11 or equivalent

D	Ⓐ SPAS—C SPAL—C	Ⓐ SPAX—C	Ⓓ Ⓡ Ⓔ Ⓖ SP□S—C SP□L—C	Ⓓ Ⓡ Ⓔ Ⓖ SP□X—C
10	Quotation			—
13				
16				
20				
25				
32				
38				
45				

Volume discount is also applicable to alteration fees.

Days to ship

●The number of days (business days following the day of your order) required before shipping from MISUMI's distribution center in Singapore. P.i

SGP Stock — 3 Days — 5 Days — 7 Days — 8 Days — 10 Days — 12 Days — 14 Days — 18 Days

●Express delivery services P.i

Express T — Express A — Express B — Express C

Alteration

●Select alterations with code.

Price

●Prices are to be quoted.

●Volume discount rates are available for most products.

How to find the product

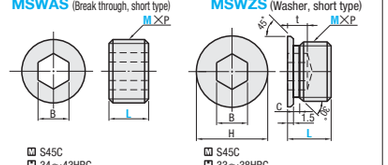
●Use the Contents page to find the products by product name and page number.

About the JIS notation

RoHS



MSW (Short type)
MSWS (Short type)
MSWA (Break through type)
MSWAS (Break through, short type)
MSWZ (Washer type)
MSWZS (Washer, short type)



Ⓜ MSW SCM435(M2.5～10) S45C(M12～45)
MSWS S45C
Ⓗ 34～43HRC
Ⓢ Fe3O4(Black oxide) (JIS B 0207/Grade 2)

Ⓜ S45C
Ⓗ 34～43HRC
Ⓢ Fe3O4(Black oxide) (JIS B 0207/Grade 2)

Ⓜ S45C
Ⓗ 33～38HRC
Ⓢ Fe3O4(Black oxide) (JIS B 0207/Grade 2)

●In the case that JIS standards are indicated on certain location of the product page, please note that this is only for product reference and is not an indication that the product is conforming to the JIS standards

CAD data

●Two-dimensional CAD data (in DXF and IGES formats) is available for some products in this catalog. Download the files from the MISUMI's website.
MISUMI SOUTH EAST ASIA
http://sg.misumi-ec.com/contents/cad/
MISUMI MALAYSIA
http://my.misumi-ec.com/contents/cad/

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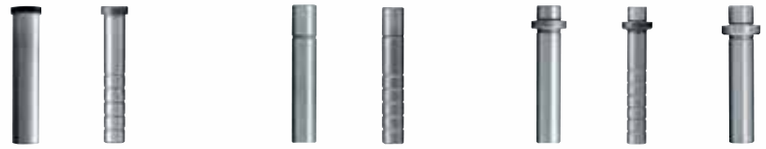
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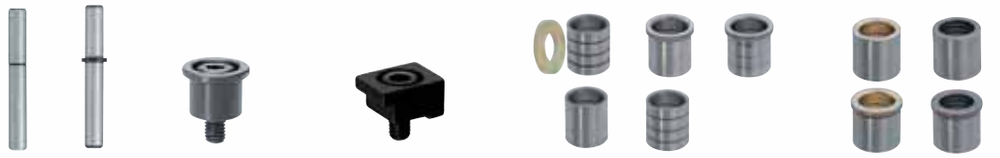
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STRIPPER GUIDE PINS & BUSHINGS

STRIPPER GUIDE PINS & BUSHINGS



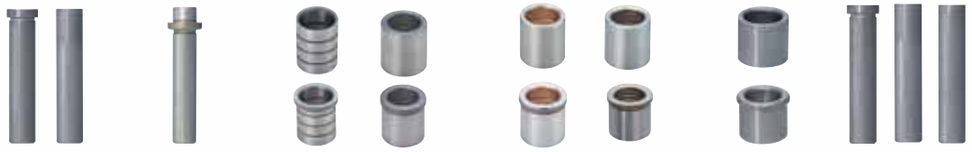
Name	STRIPPER GUIDE PINS—Headed type—		STRIPPER GUIDE PINS—Straight type—		STRIPPER GUIDE PINS—Demountable type—		
Catalog No.	SGPH	SGOH	SGPN	SGON	SGPR	SGOR	SGPW
Delivery	STOCK	STOCK	STOCK	STOCK	STOCK	⑤Ⓐ	③
Page	5	5	6	6	7	7	8



HIGH RIGIDITY STRIPPER GUIDE PINS		FIXED-TYPE STOPPERS FOR BALL BEARING GUIDE	CLAMPS FOR STRIPPER GUIDE PIN	STRIPPER GUIDE BUSHINGS—Steel—			—Copper alloy—	—Oil free—	
SGPWS	SGPWH	SSTK	FCLP	SGBD	SGBA	SGBH SGBL SGBT	SGSF	SGBF	SGBZ SGHZ
⑤	⑤	⑤Ⓐ	⑤Ⓐ	③	STOCK		③	STOCK	
9	9	10	10	11			12		12



—Copper alloy—	—Sintered alloy—	STRIPPER GUIDE BUSHINGS	STRIPPER GUIDE BUSHINGS	BALL BEARING CAGES	SPRINGS
SGCZ SGFZ	SGBM SGHM	SGBB SGBBL SGBBF	SGBBW SGBBS SGBBH	MBSH MBJH	BSWP
③ STOCK	③ STOCK	③ STOCK	STOCK	STOCK	⑤ⓉⒶ
13	13	14	15	16	16



STRIPPER GUIDE PINS—3 μm range—		STRIPPER GUIDE BUSHINGS—3 μm range, Steel—		—Copper alloy—		—Sintered alloy—		HIGH PRECISION CARBIDE STRIPPER GUIDE PINS		
TGPH TGPN	—Demountable type— TGPR	TGBL TGBT	TGBZ TGHZ	TGSF TGBF	TGCZ TGFZ	TGBM	TGHM	WVGPH	WVGPN	WVGPS
③	⑤Ⓐ	⑤Ⓐ	③	⑤Ⓐ	③	⑤Ⓐ		⑦Ⓑ		
18	18	19		19	20	20		22		



HIGH PRECISION STRIPPER GUIDE PINS			—Demountable type—	HIGH PRECISION STRIPPER GUIDE BUSHINGS—Steel—				—Copper alloy—			—Sintered alloy—	
VGPH	VGPN	VGPS	VGPR	VGBL	VGBH	VGBZ	VGHZ	VSGSF	VSGBF	VSGCZ	VSGFZ	VGBM VGHM
STOCK	⑤ⓉⒶ		⑤Ⓐ	⑤ⓉⒶ			STOCK	⑤Ⓐ		⑤Ⓐ	STOCK	⑤Ⓐ
23			24	25				25		26		26



HIGH RIGIDITY NEEDLE ROLLER STRIPPER GUIDE PIN SETS	—Single roller type—	NEEDLE ROLLER CAGE	FIXING TYPE STOPPERS FOR NEEDLE ROLLER	SPRINGS
RSGPW	RSGPS	RBJ	RSTKH	RSWP
⑩	⑩	⑤ⓉⒶ	⑤Ⓐ	⑤ⓉⒶ
-	-	-	-	-

Please note that the above delivery day only applicable to Singapore area. For other areas, please refer to P.i

■How to mount stripper guide bushings

Item		Plain bushing				Ball bearing bushings	
		Devcon adhesive type (SGBD)	Press fit type —Straight type— (SGBA)	Press fit type —Headed type— (SGBH)	Loctite adhesive type (SGBL, SGBT, SGBZ, SGHZ, etc.)	Press fit type (SGBB)	Loctite adhesive type (SGBBL, SGBBF, SGBBW, SGBBS, etc.)
Before press fit	Clearance between pin and bushing	2 μ～12 μ	10 μ～20 μ	5 μ～15 μ	2 μ～12 μ	0 μ～−10 μ	−10 μ～−20 μ
Inside diameter shrinkage while press fitting		—	3 μ～8 μ	1 μ～ 3 μ	—	2 μ～ 6 μ	—
Recommended press fit allowance for plate		—	8 μ～10 μ	3 μ～ 5 μ	—	6 μ～ 8 μ	—
After press fit	Clearance between pin and bushing	—	2 μ～17 μ	2 μ～14 μ	—	−2 μ～−16 μ	—
Clearance between mounting hole and outside diameter of bushing (recommended value)		outside diameter of bushing +2～+3 on one side to	—	—	outside diameter of bushing +0.01～+0.03 on one side to	—	outside diameter of bushing +0.01～+0.03 on one side to
How to mount		Devcon adhesive	Press fit	Press fit	Loctite adhesive No.638	Press fit	Loctite adhesive No.638

See page 51 for Loctite adhesives.

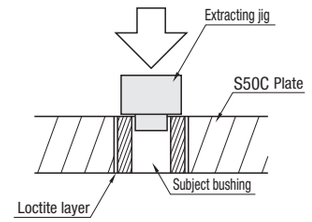
■Measurement of fixed compression shear strength of guide bushings with Loctite 638

With Loctite adhesive, shear force of 8～10 times greater than press fit (interference fit) was obtained.

Subject bushing	Type	Fitting clearance (Both sides)	Compression shear force (kgf)	Compression shear strength (kgf/mm²)
SGBL25—20	Stripper guide bushing Loctite adhesive type	0.014～0.060	4,463kgf	228kgf/mm²
VGBL25—20	Precision class stripper guide bushing Loctite adhesive type	0.003～0.006	3,382kgf	198kgf/mm²
SGBH25—20	Stripper guide bushing Press fit type	−0.004～0.008 (close fit)	420kgf	21kgf/mm²

(Curing time：Room temperature (25℃)×72 hours Plate：S50C Guide bushing：SUJ2
Plate and bushing had been degreased.)

Compression test machine
Extracting rate：10mm/min



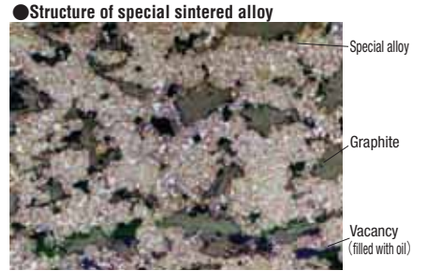
■Sintered alloy oil-free bushings

Bushing that is made of special alloy and covered with fine solid lubricant, which is mainly made of graphite. The small vacancies of the alloy are impregnated with lubricating oil.

●Features

- Can be used for to subtle strokes of less than 1mm.
  The solid lubricant on the surface enables the extra short strokes. Best suited as stripper guide bushing.
  No limit in sliding direction. Can put up with reciprocating, rocking, and rotational motions.
- Have excellent friction coefficients and wear resistance to cope with high-speed strokes.
- Owing to new technologies, a large amount of solid lubricant is contained compared to other sintered bushings. That makes it possible to maintain stable performance over a long period of time.
- Though it is oil-free, its performance will be further enhanced with initial break-in grease or lubrication.

●Structure of special sintered alloy



●Notes

- As the bushing is impregnated with lubricating oil, do not clean the inside of it.
- It is not possible to accurately measure the surface roughness because there are small vacancies in the material. However, the finishing method is the same as that of other types of guide bushings.

●Range of use

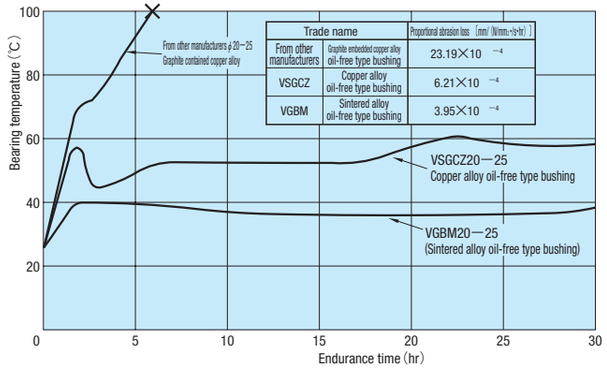
Lubrication：Oil-free
Operating temperature limit：−40～+120℃
Allowable maximum speed：60m/min

●Mechanical property

Thermal expansion coefficient： 12×10⁻⁶/℃
Density： 5.8g/cm³

●Test data

Test machine：Reciprocating motion test machine
Bushing： φ20× φ28×L25
Guide pin： VGPS20 (SKD11 58HRC～)
Bearing： 1.2N/mm² {12kgf/cm²}
Rate：30m/min, 300spm
Stroke： 50mm
Lubrication：Application of initial breaking-in grease



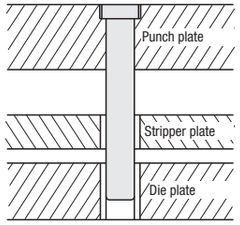
Trade name		Proportional abrasion loss (mm²/N/mm×10⁴hr)
From other manufacturers	Graphite embedded copper alloy oil-free type bushing	23.19×10⁻⁴
VSGCZ	Copper alloy oil-free type bushing	6.21×10⁻⁴
VGBM	Sintered alloy oil-free type bushing	3.95×10⁻⁴

Transition of bearing temperatures in various bearing materials

STRIPER GUIDE PINS & BUSHINGS
—GUIDE—

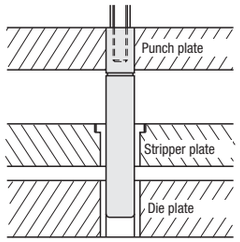
■Stripper guide pins

Headed type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPH	SUJ2		P.5
	SGOH	SUJ2	Oil groove	
−0.010 −0.013	TGPH (3μm range)	SUJ2		P.18
−0.010 −0.012	VGPH (High precision)	SKD11		P.23
	WVGPH (High precision)	Carbide		P.22

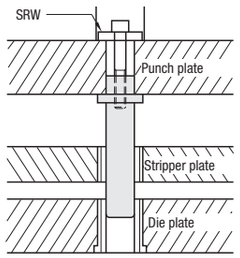
Straight type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPN	SUJ2		P.6
	SGON	SUJ2	Oil groove	
−0.010 −0.013	TGPN (3μm range)	SUJ2		P.18
−0.010 −0.012	VGPN (High precision)	SKD11		P.23
	VGPS (High precision)	SKD11	Lead-in part	
	WVGPN (High precision)	Carbide		P.22
	WVGPS (High precision)	Carbide	Lead-in part	

● Lead-in part：Lead-in part is provided on the threaded side. By adjusting the mounting hole, this type can be fixed either by press fit or transition fit.

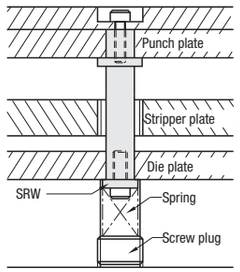
Demountable type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPR	SUJ2		P.7
	SGOR	SUJ2	Oil groove	
−0.010 −0.013	TGPR (3μm range)	SUJ2		P.18
−0.010 −0.012	VGPR (High precision)	SKD11		P.24

● Straight demountable type is mounted with a bolt from the die set side. It enables demounting without disassembling the dies.
● Perpendicular can be retained by mounting it in contact with the punch plate face firmly.
SRW ring：This ring can be used to retain the pin when the hole is through without backing plate. SRW ☞ P.92

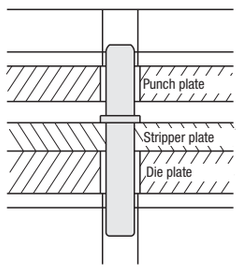
Demountable and both ends tapped type



Sliding part diam.tolerance	Catalog No.	Material	Refer page
−0.010 −0.015	SGPW	SUJ2	P.8

● This stripper guide pin is for the dies with which the upper die is pushed up from the bottom, e.g. for intermittent cutting process of progressive dies, tapping types, etc.
SRW ring…Use it as a stopper on the die plate side of the stripper guide pin. SRW ☞ P.92

Stripper plate fixing type



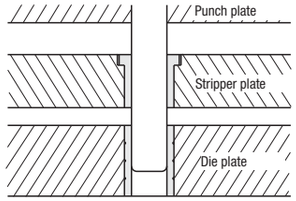
Guide type	Catalog No.	Refer page
Needle roller bearing guide	RSGPW	-
Ball bearing guide/Plain guide	SGPWS SGPWH	P.9

● Since the guide pin is fixed to the stripper plate, which is close to the cutting part (punch・die), the shaft rigidity can be improved compared to conventional fixing methods. Therefore, higher levels of precise punching and durability can be realized.

■Stripper guide bushings

See page 51 for Loctite adhesives.

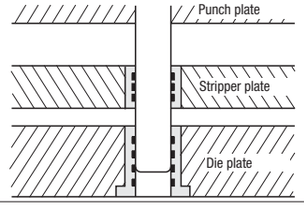
Lubricant type



Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
+0.005 0 −0.005	SGBA	SUJ2	Straight	Press fit	P.11
	SGBH		Headed		
−0.003 −0.008	SGBD		Straight	Devcon adhesive	
	SGBL		Straight	Loctite adhesive	
	SGBT		Headed		
−0.010 −0.013	TGBL (3μm range)	SUJ2	Straight	Loctite adhesive	P.19
	TGBT (3μm range)		Headed		
−0.003 −0.005	VGBL (High precision)	SUJ2	Straight	Loctite adhesive	P.25
	VGBH (High precision)		Headed		

● Press fit type：While the precision hole is required for mounting, these stripper guide bushings enable parallel machining and assembly that results improvement in workability.
● Devcon adhesive type：2～3mm clearance on each side of the mounting hole.
● Loctite adhesive type：0.01～0.03mm clearance on each side of the mounting hole.

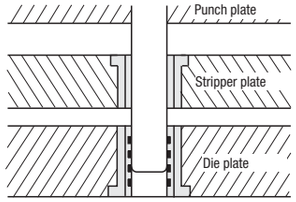
Oil-free type



Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
−0.003 −0.008	SGBZ	FC250	Straight	Loctite adhesive	P.12
	SGHZ		Headed		
−0.003 −0.006	TGBZ (3μm range)		Straight	Loctite adhesive	P.19
	TGHZ (3μm range)		Headed		
−0.003 −0.005	VGBZ (High precision)		Straight	Loctite adhesive	P.25
	VGHZ (High precision)		Headed		

● Oil-free type…Lubrication is not needed because special solid lubricant is embedded. (Endurance will be further improved with initial breaking-in oil.)

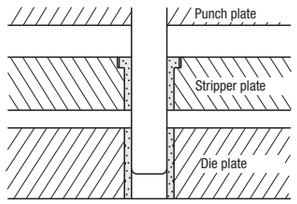
(Copper alloy internal coating) Oil type Oil-free type



Type	Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
Lubricant type	−0.003 −0.008	SGSF	SUJ2+ Copper alloy	Straight	Loctite adhesive	P.12
		SGBF		Headed		
	−0.003 −0.006	TGSF (3μm range)		Straight		P.19
		TGBF (3μm range)		Headed		
	−0.003 −0.005	VSGSF (High precision)		Straight		P.25
		VSGBF (High precision)		Headed		
Oil-free type	−0.003 −0.008	SGCZ		Straight		P.13
		SGFZ		Headed		
	−0.003 −0.006	TGCZ (3μm range)		Straight		P.19
		TGFZ (3μm range)		Headed		
	−0.003 −0.005	VSGCZ (High precision)		Straight		P.26
		VSGFZ (High precision)		Headed		

● The guide's internal surface is coated with copper alloy for improved seize resistance. There are oil type and oil- free type in which special solid lubricant is embedded.

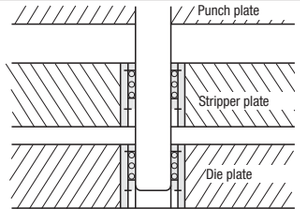
(Sintered alloy) Oil-free type



Type	Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
Oil-free type	−0.003 −0.008	SGBM	Special sintered alloy	Straight	Loctite adhesive	P.13
		SGHM		Headed		
	−0.003 −0.006	TGBM (3μm range)		Straight		P.19
		TGHM (3μm range)		Headed		
	−0.003 −0.005	VGBM (High precision)		Straight		P.26
		VGHM (High precision)		Headed		

● Sintered alloy type… A new type of oil-free bushing produced from a special alloy on which solid lubricant made mainly of graphite is dispersed and sintered. Its friction coefficient is lower than those of other cast iron and copper alloy bushings, and wear resistance is superior. Sufficient amount of solid lubricant makes its oil content high, allowing high-speed operation without losing oil film.

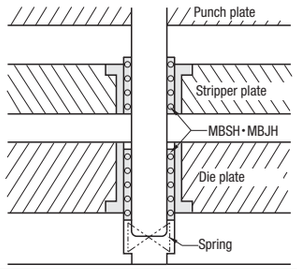
Ball bearing Cage-integrated type



Catalog No.	Material	Type	How to mount	Refer page
SGBB	SUJ2	Straight	Press fit	P.14
SGBBL			Loctite adhesive	
SGBBF		Headed		

● Using ball bearings for sliding motion enables outstanding seize resistance.
● Both ends are fastened with snap rings, so the cage cannot drop out of the bushing.
Please note that the stroke is limited.

Ball bearing Cage-separated type



Catalog No.	Material	Type	How to mount	Refer page
SGBBW	SUJ2	Thick	Loctite adhesive	P.15
SGBBS		Straight		
SGBBH		Headed		

● Using ball bearings for sliding motion enables outstanding seize resistance.
For the ball cage, use MBSH (made of aluminum) or MBJH (made of plastic). (See ☞ P.16)

STRIPPER GUIDE PINS
—HEADED TYPE—

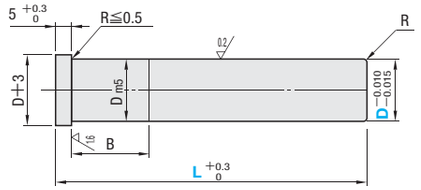
MORE ITEMS　SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

SGPH

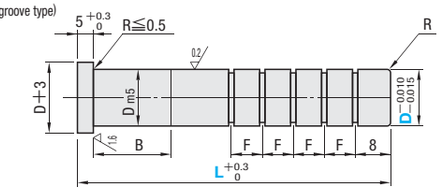


M SUJ2
H 58HRC～



RoHS

SGOH (Oil groove type)



D \ L	Number of grooves (n) 40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※L 40～119.5　→F= 8
L120～L(C)max.　→F=10

M SUJ2　H 58HRC～

D_{m5}		R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9 SGPH	SGOH
8	+0.012 +0.006	1.0	10	SGPH SGOH*	8	40 50 60 70 80	Quotation	
10			13		10*	40* 50* 60* 70* 80* 90* 100*		
13	+0.015 +0.007	1.5	16		13*	40 50* 60* 70* 80* 90* 100* 110* 120*		
16			20		16*	50* 60* 70* 80* 90* 100* 110* 120* 130* 140*		
20	+0.017 +0.008	2.0	25		20*	60* 70* 80* 90* 100* 110* 120* 130* 140*		
25			28		25*	70* 80* 90* 100* 110* 120* 130* 140*		

SGOH with * are Stock Product.

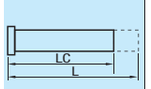
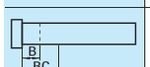
Order　Catalog No. — L
SGPH 16 — 100
• SGPH SGOH* • SGOH (w/o *)

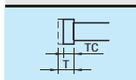
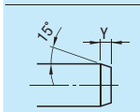
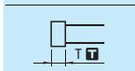
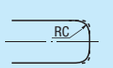
Delivery　SGP Stock　3 Days
For area out of Singapore please refer to P.i.

Alteration　Catalog No. — L(LC) — (BC・TC・GC・TKC・RC)
SGPH 16 — LC95 — BC15
• SGPH　5 Days　Express T　Express A
• SGOH　5 Days　Express A

■Volume discount rate

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

Alteration	Code	Spec.	Price
	LC	Changes dimension L (full length) 0.5mm increments • SGPH: 20≦LC＜L • SGOH: 40≦LC＜L The B dimension conforms to the standard. When full length is reduced shorter than min. length, apply BC accordingly if needed.	Quotation
	LC	Changes dimension L (full length) (Long type LC) D / LC 0.5mm increments / Price SGPH SGOH 8 80＜LC≦120 10 100＜LC≦150 13 120＜LC≦180 16 140＜LC≦200 20 140＜LC≦200 25 140＜LC≦200 Quotation	
	BC	Changes dimension B 1mm increments 0≦BC≦D×2 Full length L is the dimension as specified.	

Alteration	Code	Spec.	Price
	TC	Changes dimension T (head thickness) 0.1mm increments 2≦TC＜5 L becomes shorter by (5—TC). When LC is applied, the full length is equal to LC.	Quotation
	GC	Adds taper on the tip D / Y 8 10 13 16 20 25 / 3 / 5	
	TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	
	RC	Changes dimension R (radius) on the tip D / Normal type R / RC(Selection) 8・10 / 1.0 / 1.5・2.0 13・16 / 1.5 / 2.0・2.5 20・25 / 2.0 / 2.5・3.0	

Stocks Availability Subjected to Prior Sales.

STRIPPER GUIDE PINS
—STRAIGHT TYPE—

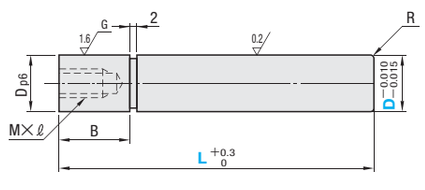
MORE ITEMS　SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

SGPN

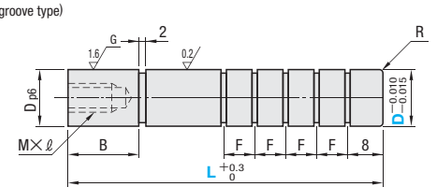


M SUJ2
H 58HRC～



RoHS

SGON (Oil groove type)



D \ L	Number of grooves (n) 40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※L 40～119.5　→F= 8
L120～L(C)max.　→F=10

M SUJ2　H 58HRC～

D_{p6}		M×ℓ Pitch	R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9 SGPN	SGON
8	+0.024 +0.015	M5×12 P0.8	1.0	10	SGPN SGON*	8	40 50 60 70 80	Quotation	
10				13		10	40 50 60 70 80 90 100		
13	+0.029 +0.018	M6×15 P1.0	1.5	16		13*	40 50 60* 70* 80* 90* 100* 110 120		
16				20		16*	50 60 70* 80* 90* 100* 110* 120*		
20	+0.035 +0.022	M8×20 P1.25	2.0	25		20*	60 70* 80* 90* 100* 110* 120 130 140		
25				28		25*	70 80 90* 100 110 120 130 140		

SGON with * are Stock Product.

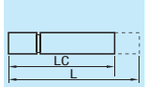
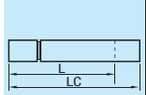
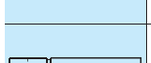
Order　Catalog No. — L
SGPN 20 — 80
• SGPN・SGON* • SGPN Printed in Blue・SGON w/o*

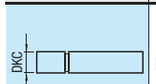
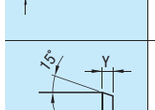
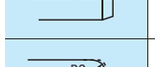
Delivery　SGP Stock　3 Days
For area out of Singapore please refer to P.i.

Alteration　Catalog No. — L(LC) — (BC・DKC・GC・RC・TGC)
SGPN 20 — LC75 — BC20
• SGPN　5 Days　Express T　Express A　P.i
• SGON　5 Days　Express A

■Volume discount rate

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

Alteration	Code	Spec.	Price
	LC	Changes dimension L (full length) 0.5mm increments • SGPN: 20≦LC＜L • SGON: 40≦LC＜L The B dimension conforms to the standard. When full length is reduced shorter than min. length, apply BC accordingly if needed. When LC ≦25, the pilot hole for tapping may go through.	Quotation
	LC	Changes dimension L (full length) (Long type LC) D / LC 0.5mm increments / Price SGPN SGON 8 80＜LC≦120 10 100＜LC≦150 13 120＜LC≦180 16 120＜LC≦200 20 140＜LC≦200 25 140＜LC≦200 Quotation	
	BC	Changes dimension B 1mm increments 0≦BC≦D×2 Using BC code Full length L and tap depth are the dimensions as specified. When BC=0,2mm groove is eliminated.	

Alteration	Code	Spec.	Price
	DKC	Changes press fit tolerance Dp6 ⇨ Dm5 ⊗SGON : Not applicable Dm5: 8 +0.012 +0.006; 10 +0.015 +0.007; 13 +0.017 +0.008; 16 20 25	Quotation
	GC	Adds taper on the tip D / Y 8 10 13 16 20 25 / 3 / 5	
	RC	Changes dimension R (radius) on the tip D / Normal type R / RC(Selection) 8・10 / 1.0 / 1.5・2.0 13・16 / 1.5 / 2.0・2.5 20・25 / 2.0 / 2.5・3.0	
	TGC	Modifies the tap side end Perpendicularity 0.01/Surface roughness 1.6a	

Stocks Availability Subjected to Prior Sales.

STRIPPER GUIDE PINS
—DEMOUNTABLE TYPE—

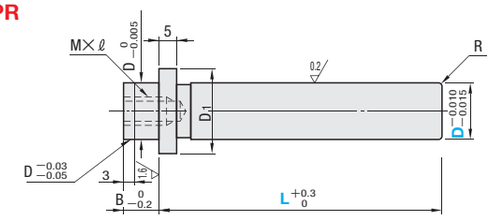
MORE ITEMS　SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

SGPR

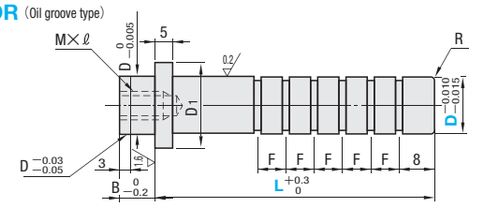


M SUJ2
H 58HRC～



RoHS

SGOR (Oil groove type)



L(C) / D	Number of grooves (n) 30～	40～	60～	70～	80～
8	2	3	4	5	—
10	2	3	4	5	6
13	2	3	4	5	6
16	2	3	4	5	6
20	2	3	4	5	6
25	2	3	4	5	6

※L(C) 30～119.5 →F= 8
L120～L(C) max. →F=10

M SUJ2　H 58HRC～

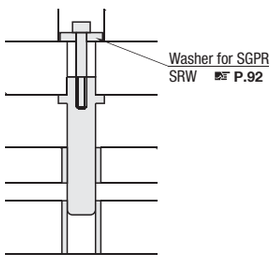
M×ℓ Pitch	D1	R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9 SGPR	SGOR
M5×12 P0.7	13	1.0	8	SGPR SGOR	8	30 40 50 60 70	Quotation	
	16				10	30 40 50 60 70 80		
M6×15 P1.0	20	1.5	10		13	40 50 60 70 80 90 100		
	23				16	40 50 60 70 80 90 100 110 120		
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100 110 120		
	32		16		25	60 70 80 90 100 110 120		

Order　Catalog No. — L　SGPR 16 — 100

Delivery
- SGPR　Printed in Red: SGP Stock　Printed in Blue: 3 Days
- SGOR　5 Days　Express A　P.i

For area out of Singapore please refer to P.i.

Example



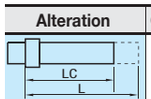
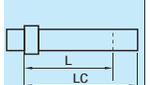
■Volume discount rate

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

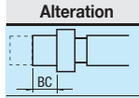
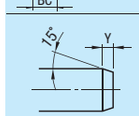
Alteration　Catalog No. — L(LC) — (BC・GC・RC)　SGPR 16 — LC95

- SGPR　5 Days　Express T　Express A　P.i
- SGOR　5 Days　Express A　P.i

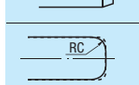
For area out of Singapore please refer to P.i.

Alteration	Code	Spec.	Price
	LC	Changes dimension L (full length) 30≦LC＜L　0.5mm increments	Quotation
	LC	Changes dimension L (full length) (Long type LC)	

D	LC 0.5mm increments	Price SGPR	SGOR
8	70＜LC≦ 80		
10	80＜LC≦100		
13	100＜LC≦120	Quotation	
16	120＜LC≦140		
20	120＜LC≦140		
25	120＜LC≦140		

Alteration	Code	Spec.	Price
	BC	Changes dimension B 1mm increments 5≦BC＜B The depth of M tap becomes shorter by (B—BC).	Quotation
	GC	Adds taper on the tip	

D	Y
8 10 13	3
16 20 25	5

	RC	Changes dimension R (radius) on the tip		

D	Normal type R	RC(Selection)
8・10	1.0	1.5・2.0
13・16	1.5	2.0・2.5
20・25	2.0	2.5・3.0

Stocks Availability Subjected to Prior Sales.

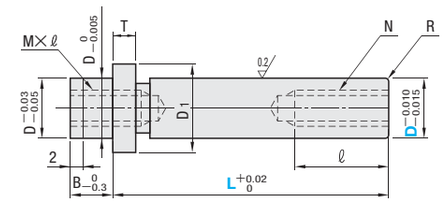
STRIPPER GUIDE PINS
—DEMOUNTABLE AND BOTH ENDS TAPPED TYPE—

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

SGPW



M SUJ2
H 58HRC～

M×ℓ Pitch	N Pitch	ℓ	D1	R	T	B	Catalog No. Type	D	L 5mm increments	U/Price Q'ty : 1～9
M4×12 P0.7	M4 P0.7	8～13	12	1.0	3	8	SGPW	8	25～ 70	Quotation
			14			10		10		
M5×15 P0.8	M5 P0.8	10～15	17	1.5	5	10		13	30～ 75	
M6×15 P1.0	M6 P1.0		23					16	40～100	
M8×20 P1.25	M8 P1.25	16～21	27	2.0		13		20	60～120	
			32			16		25		

Order　Catalog No. — L　SGPW 10 — 55

Delivery　3 Days

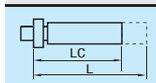
For area out of Singapore please refer to P.i.

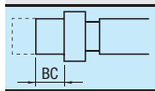
Alteration　Catalog No. — L(LC) — (BC)　SGPW 10 — LC54 — BC6　5 Days　Express T　Express A　P.i

For area out of Singapore please refer to P.i.

■Volume discount rate

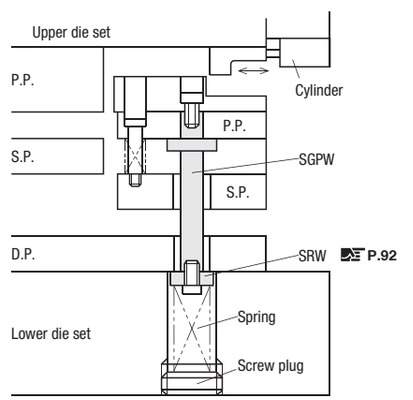
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

Alteration	Code	Spec.	Price
	LC	Changes dimension L (full length) D 8～13 25≦LC＜L D16～25 (Lmin—5)≦LC＜L 0.5mm increments	Quotation

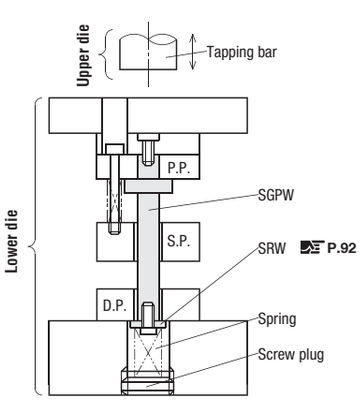
Alteration	Code	Spec.	Price
	BC	Changes dimension B 1mm increments 5≦BC＜B The depth of M tap becomes shorter by (B—BC).	Quotation

Example

- Use this stripper guide pin for the dies with which the punch plate is pushed up from the lower die side.



Intermittent cutting process of progressive die



Movable bottom die

HIGH RIGIDITY STRIPPER GUIDE PINS
—STRIPPER PLATE FIXING TYPE—

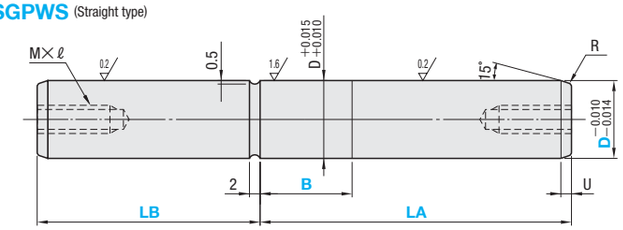
The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

SGPWS and **SGPWH** can be used with any bushings listed on pages 11 to 16. Select a suitable combination according to the nature of operation.



RoHS

SGPWS (Straight type)

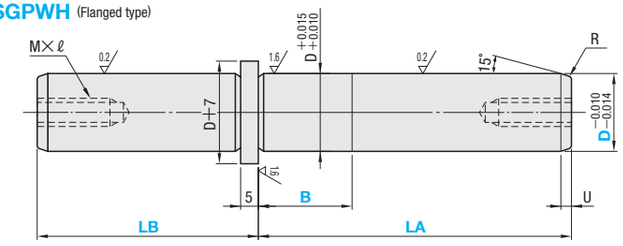


M SUJ2
H 58HRC～



RoHS

SGPWH (Flanged type)



M SUJ2
H 58HRC～

U	R	M×ℓ Pitch	Catalog No. Type	D	LA	LB 10mm increments	B 1mm increments	U/Price Q'ty：1～9 SGPWS	SGPWH
2	1.5	M5×22 P0.8	SGPWH (Flanged type)	13	60	30～50	10～30	—	
					70	30～60		—	
					80	40～60		—	
3	2	M6×25 P1.0	SGPWS (Straight type)	16	70	30～60			
					80	30～70			
					90	40～80			
		M8×25 P1.25		20	80	40～70			Quotation
					90	40～70			
					100	50～80			
4	3		SGPWH (Flanged type)	25	90	50～70			
					100	50～80			
					110	60～90			

Order: Catalog No. — LA — LB — B
SGPWS 25 — 100 — 60 — B30

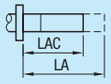
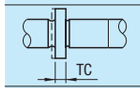
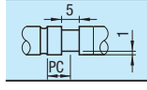
Delivery: 5 Days

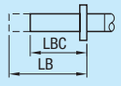
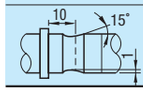
For area out of Singapore please refer to P.i.

Volume discount rate

Quantity	1～9	10～20
Rate	—	5%

Alteration: Catalog No. — LA(LAC) — LB(LBC) — B — (TC・PC・NC)
SGPWH 20 — LAC 78 — 50 — B25 — TC4

Alteration	Code	Spec.	Price
	LAC	Dimension LA alteration D / LA / 1mm increments 13: 60 50≦LAC＜60; 70 61≦LAC＜70; 80 71≦LAC＜80 16: 70 60≦LAC＜70; 80 71≦LAC＜80; 90 81≦LAC＜90 20: 80 70≦LAC＜80; 90 81≦LAC＜90; 100 91≦LAC＜100 25: 90 80≦LAC＜90; 100 91≦LAC＜100; 110 101≦LAC＜110 The tap depth becomes shorter by (LA−LAC).	Quotation
	TC	Changes flange thickness 3≦TC＜5 1mm increments Applicable to SGPWH	
	PC	Adds groove for bolt fixing 1mm increments 5≦PC≦B−5 Applicable to SGPWS	

Alteration	Code	Spec.	Price
	LBC	Changes dimension LB D / LA / 1mm increments 13: 60 20≦LBC＜50; 70 20≦LBC＜60; 80 30≦LBC＜60 16: 70 20≦LBC＜60; 80 20≦LBC＜70; 90 30≦LBC＜80 20: 80 30≦LBC＜70; 90 30≦LBC＜70; 100 40≦LBC＜80 25: 90 40≦LBC＜70; 100 40≦LBC＜80; 110 50≦LBC＜90 The tap depth becomes shorter by (LB−LBC).	Quotation
	NC	Adds groove for bolt fixing Fixed at 10mm position (for M6) Applicable to SGPWH B≧16	

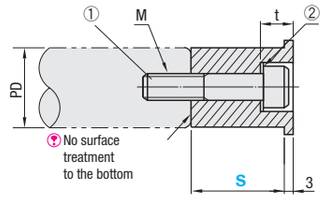
FIXED-TYPE STOPPERS FOR BALL BEARING GUIDES / CLAMPS FOR STRIPPER GUIDE PIN

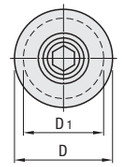
The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.



RoHS

SSTK (Fixed-type stopper for ball bearing)





M S45C
S Black oxide (Fe_3O_4)
A ①CB ②Spring washer

D	D_1	t	M	Catalog No. Type	No.	S 1mm increments	U/Price Q'ty：1～9
15	12	6.5	5	SSTK (Fixed-type stopper)	13	10～20	Quotation
17.3	15	8.5	6		16	10～20	
24	19	11	8		20	11～25	
29	24				25	11～30	

PD (No.)	①Bolt CB S 10～13	14～18	19～23	24～28	29～30
13	M5×15	M5×20	M5×25	—	—
16	M6×15	M6×20	M6×25	—	—
20	M8×15	M8×20	M8×25	M8×30	—
25	M8×15	M8×20	M8×25	M8×30	M8×35

Order: Catalog No. — S
SSTK 16 — 12

Delivery: 5 Days

Express A P.i

For area out of Singapore please refer to P.i.

Volume discount rate

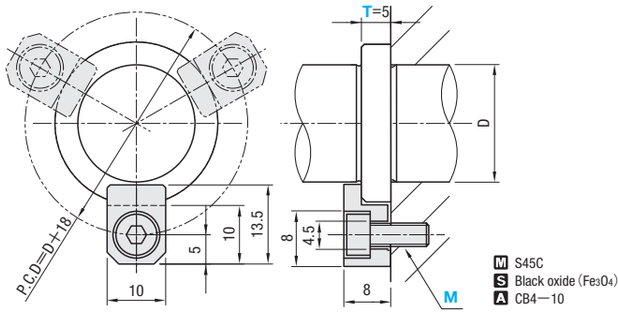
Quantity	1～9	10～20
Rate	—	5%

Use SSTK when setting a stripper guide bushing for ball cage (P.15) to SGPWS and SGPWH.

RoHS

FCLP (Clamp for stripper guide pin)





M S45C
S Black oxide (Fe_3O_4)
A CB4—10

Catalog No. Type	T	M	U/Price (1Pc.) Q'ty：1～9
FCLP	5	4	Quotation

FCLP can be used as a clamp for SGPWH, RSGPW and RSGPS. For D20 and below, use three clamps, and for D25 and adove, use four clamps.

Order: Catalog No. — M
FCLP 5 — 4

Delivery: 5 Days

Express A P.i

For area out of Singapore please refer to P.i.

Volume discount rate

Quantity	1～9	10～20
Rate	—	5%

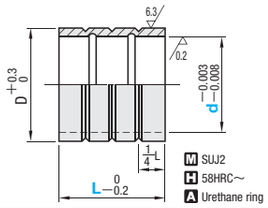
STRIPPER GUIDE BUSHINGS
—OIL TYPE / OIL-FREE TYPE—

MORE ITEMS　SGP Stock　Printed in Red

■Oil type　Use the stripper guide bushings at room temperatures (40℃ or less).

SGBD (Devcon adhesive type)



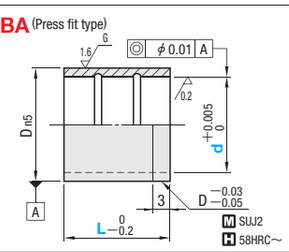


D	Catalog No. Type	d	L	U/Price Q'ty : 1～9
12	SGBD	8	10 13 16 20	Quotation
14		10	10 13 16 20 25	
18		13	13 16 20 25	
22		16	16 20 25 30	
25		20	20 25 30	
32		25	25 30 35	

Put the attached urethane ring to guide pin to prevent Devcon from dropping when adhering
Urethane ring is not provided when LC alteration is required.

SGBA (Press fit type)

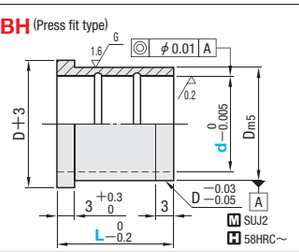




Dn5	Catalog No. Type	d	L	U/Price Q'ty : 1～9
12 +0.020 +0.012	SGBA	8	10 13 16 20	Quotation
14 +0.020 +0.012		10	10 13 16 20 25	
18 +0.020 +0.012		13	13 16 20 25	
22 +0.024 +0.015		16	16 20 25 30	
25 +0.024 +0.015		20	20 25 30	
32 +0.028 +0.017		25	25 30 35	

SGBH (Press fit type)

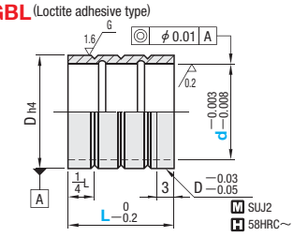




Dm5	Catalog No. Type	d	L	U/Price Q'ty : 1～9
12 +0.015 +0.007	SGBH	8	10 13 16 20	Quotation
14 +0.015 +0.007		10	10 13 16 20 22 25	
18 +0.015 +0.007		13	13 16 20 22 25 30 35	
22 +0.017 +0.008		16	13 16 20 22 25 30 35	
25 +0.017 +0.008		20	16 20 22 25 30 35	
32 +0.020 +0.009		25	20 22 25 30 35	

SGBL (Loctite adhesive type)

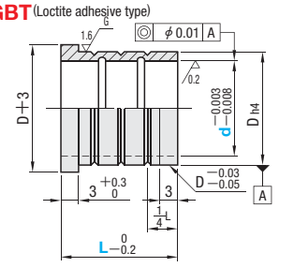




Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
12 0 −0.005	SGBL	8	10 13 16 20	Quotation
14 0 −0.005		10	10 13 16 20 22 25	
18 0 −0.005		13	13 16 20 22 25 30 35	
22 0 −0.006		16	13 16 20 22 25 30 35	
25 0 −0.006		20	16 20 22 25 30 35	
32 0 −0.007		25	20 22 25 30 35	

SGBT (Loctite adhesive type)



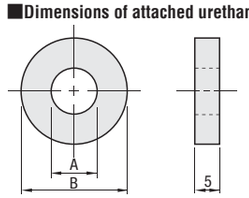


＊Number of outside diameter grooves　：L≦20→2　L＞20→3

M SUJ2
H 58HRC～

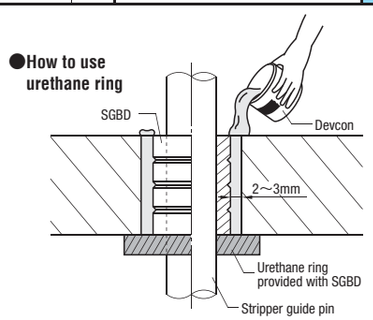
Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
12 0 −0.005	SGBT	8	10 13 16 20	Quotation
14 0 −0.005		10	10 13 16 20 22 25	
18 0 −0.005		13	13 16 20 22 25 30 35	
22 0 −0.006		16	13 16 20 22 25 30 35	
25 0 −0.006		20	16 20 22 25 30 35	
32 0 −0.007		25	20 22 25 30 35	

■Dimensions of attached urethane ring SGBD



Catalog No.	A	B
SGBD 8	8	25
SGBD10	10	
SGBD13	13	35
SGBD16	16	
SGBD20	20	
SGBD25	25	45

●How to use urethane ring

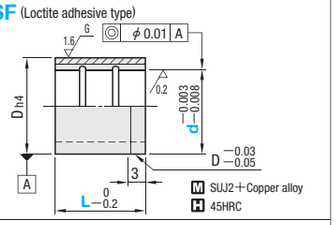


The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

■Copper alloy oil type　Use the stripper guide bushings at room temperatures (40℃ or less).

SGSF (Loctite adhesive type)

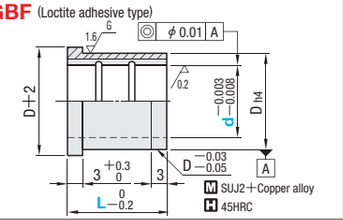




Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
16 0 −0.005	SGSF	10	10 13 16 20 22 25	Quotation
20 0 −0.006		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28 0 −0.006		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

SGBF (Loctite adhesive type)



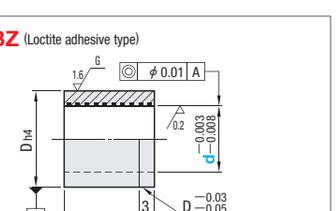


Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
16 0 −0.005	SGBF	10	10 13 16 20 22 25	Quotation
20 0 −0.006		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28 0 −0.006		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

■Oil-free type

SGBZ (Loctite adhesive type)

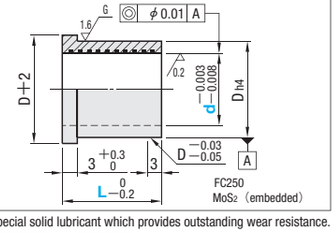




Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
13 0 −0.005	SGBZ	8	10 13 16 20	Quotation
16 0 −0.005		10	10 13 16 20 22 25	
20 0 −0.006		13	13 16 20 22 25 30	
24 0 −0.006		16	13 16 20 22 25 30 35	
28 0 −0.006		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

SGHZ (Loctite adhesive type)





Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1～9
13 0 −0.005	SGHZ	8	10 13 16 20	Quotation
16 0 −0.005		10	10 13 16 20 22 25	
20 0 −0.006		13	13 16 20 22 25 30	
24 0 −0.006		16	13 16 20 22 25 30 35	
28 0 −0.006		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

＊MoS_2 (Molybdenum disulfide) is a special solid lubricant which provides outstanding wear resistance.

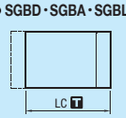
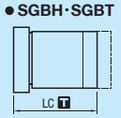
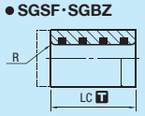
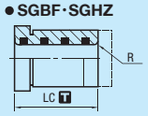
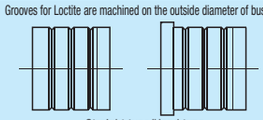
Order　Catalog No. — L
SGBH 10 — 16
● Printed in Red　● Printed in Blue

Delivery　SGP Stock　3　Days
For area out of Singapore please refer to P.i.

Alteration　Catalog No. — L(LC)
SGBD 16 —LC22.0
5　Days　Express T　Express A
For area out of Singapore please refer to P.i.

■Volume discount rate

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

Alteration	Changes dimension L (full length)				Machines grooves for Loctite.
Code	LC				DLC
Spec.	● SGBD・SGBA・SGBL	● SGBH・SGBT	● SGSF・SGBZ	● SGBF・SGHZ	Grooves for Loctite are machined on the outside diameter of bushing.
					
	SGBD：Urethane ring is not provided when LC alteration is required.		Depending on the position of the solid lubricant, R may become large.		Straight type/Head type
	d: 8 10 13 16 20 25		d: 8 10 13 16 20 25		＊Number of grooves on the outside diameter.
	LC 0.1mm increments: 8.0≦LC＜L / 8.0≦LC＜L / 10.0≦LC＜L / 13.0≦LC＜L / 16.0≦LC＜L / 20.0≦LC＜L		LC 0.1mm increments: 8.0≦LC＜L / 8.0≦LC＜L / 10.0≦LC＜L / 13.0≦LC＜L / 16.0≦LC＜L / 20.0≦LC＜L		8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3
	T: 0 −0.2		T: 0 −0.2		⊗ Not applicable to SGBD,SGBA,SGBH,SGBL and SGBT.
Price			Quotation		

Stocks Availability Subjected to Prior Sales.

STRIPPER GUIDE BUSHINGS
—OIL-FREE TYPE—

MORE ITEMS　SGP Stock　Printed in Red

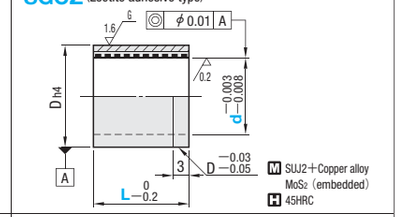
The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

■Copper alloy oil-free type

Use the stripper guide bushings at room temperatures (40℃ or less).

RoHS

SGCZ (Loctite adhesive type)

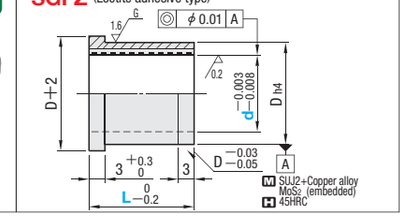


Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGCZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

＊MoS2 is a special solid lubricant which provides outstanding wear resistance.
＊SUJ2 and copper alloy are coupled by sintering.

RoHS

SGFZ (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGFZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

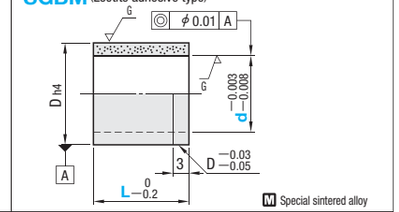
＊MoS2 is a special solid lubricant which provides outstanding wear resistance.
＊SUJ2 and copper alloy are coupled by sintering.

■Sintered alloy (Dispersed Solid lubricant) oil-free type

Product data P.2

RoHS

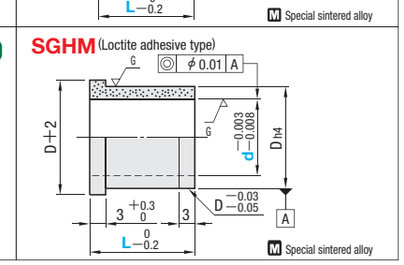
SGBM (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGBM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

RoHS

SGHM (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGHM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

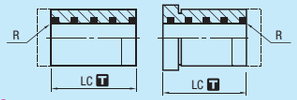
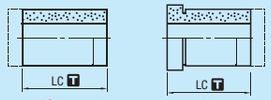
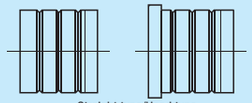
Volume discount rate

Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

Order Catalog No. — L
SGFZ 10 — 16
● Printed in Red ● Printed in Blue

Delivery SGP Stock 3 Days
For area out of Singapore please refer to P.i.

Alteration Catalog No. — L(LC)
SGFZ 16 — LC18.0
5 Days　Express T　Express A
For area out of Singapore please refer to P.i.

Alteration	Changes dimension L (full length)	Machines grooves for Loctite.
Code	LC	DLC
Spec.	● SGCZ ● SGFZ  For SGCZ and SGFZ, R may become large depending on the position of the solid lubricant. d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; 25 20.0≦LC<L; 0 −0.2 ● SGBM ● SGHM  Depending on the position of the solid lubricant, R may become large. d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; 25 20.0≦LC<L; 0 −0.2	Grooves for Loctite are machined on the outside diameter of bushing.  Straight type/Head type ＊Number of grooves on the outer diameter. 8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3
Price	Quotation	

Stocks Availability Subjected to Prior Sales.

STRIPPER GUIDE BUSHINGS
—BALL CAGE INTEGRATED TYPE—

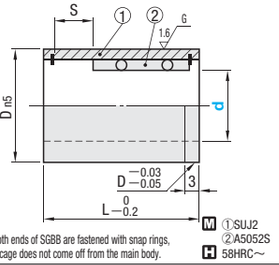
MORE ITEMS　SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

■Ball cage integrated type

RoHS

SGBB (Press fit type)

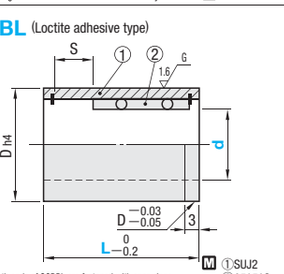


Since both ends of SGBB are fastened with snap rings, the ball cage does not come off from the main body.

Dn5	L	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	U/Price Q'ty : 1~9
16 +0.020 +0.012	24	5	55	7.8	15.6	SGBB (Press fit type)	8	Quotation
20	30			8.4	16.8		10	
25 +0.024 +0.015	35		66	9.25	18.5		13	
28	37	6	78	10.15	20.3		16	
32 +0.028 +0.017	45		96	12.75	25.5		20	
38	50	7	112	14.0	28.0		25	

RoHS

SGBBL (Loctite adhesive type)

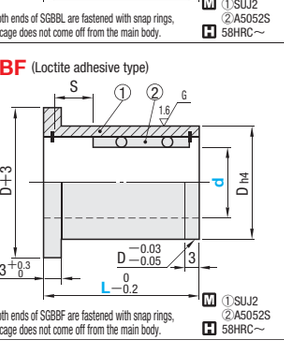


Since both ends of SGBBL are fastened with snap rings, the ball cage does not come off from the main body.

Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	U/Price Q'ty : 1~9
16 0 −0.005	5	35	5	10	SGBBL (Loctite adhesive type)	8	20	Quotation
	7	49					25	
20	6	48				10	25	
	8	64					30	
25 0 −0.006	6	60				13	25	
	8	80					30	
28	7	77				16	30	
	9	99					35	
32 0 −0.007	4	44	7.5	15		20	30	
	6	66					35	
38	8	112				25	40	

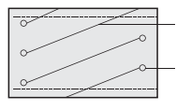
RoHS

SGBBF (Loctite adhesive type)



Since both ends of SGBBF are fastened with snap rings, the ball cage does not come off from the main body.

Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	U/Price Q'ty : 1~9
16 0 −0.005	5	35	5	10	SGBBF (Loctite adhesive type)	8	20	Quotation
	7	49					25	
20	6	48				10	25	
	8	64					30	
25 0 −0.006	6	60				13	25	
	8	80					30	
28	7	77				16	30	
	9	99					35	
32 0 −0.007	4	44	7.5	15		20	30	
	6	66					35	
38	8	112				25	40	



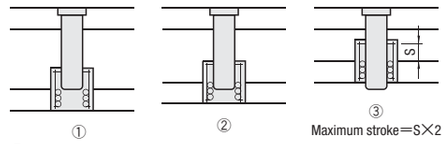
SGBB 8 ····· Diameter of ball ϕ1.588mm (1/16in.)
SGBB 10 ····· Diameter of ball ϕ2.381mm (3/32in.)
SGBB13～25 ····· Diameter of ball ϕ3.175mm (1/8in.)
SGBBL/F 8 ·····Diameter of ball ϕ1.5mm
SGBBL/F10～16 ···Diameter of ball ϕ2.0mm
SGBBL/F20・25 ···Diameter of ball ϕ3.0mm

Order Catalog No. — L
SGBB 20
SGBBL 20 — 35
● Printed in Red ● Printed in Blue

Delivery SGP Stock 3 Days
For area out of Singapore please refer to P.i.

Alteration Catalog No. — L(LC)
SGBB 16.0 — LC29.5
SGBBF 13 — LC22.5
5 Days　Express T　Express A　P.i
For area out of Singapore please refer to P.i.

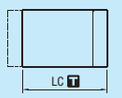
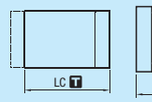
Example



①Insert the pin in the bushing fixed in the stripper plate.
②③Push the pin down to the bottom dead center as the pin and the bushing are interference fit of 2μm to 20μm.

Volume discount rate

Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

Alteration	Changes dimension L (full length)	
Code	LC	LC
Spec.	● SGBB  d / LC 0.1mm increments / T: 8 20.0≦LC<L; 10 25.0≦LC<L; 13 30.0≦LC<L; 16 30.0≦LC<L; 20 35.0≦LC<L; 25 40.0≦LC<L; 0 −0.2 Dimension S is {S−(L−LC)} (S≧2.5)	● SGBBL ● SGBBF  d / LC 0.1mm increments / T: 8 17.5≦LC<L; 10 22.5≦LC<L; 13 22.5≦LC<L; 16 25.0≦LC<L; 20 25.0≦LC<L; 25 35.0≦LC<L; 0 −0.2 Dimension S is {S−(L−LC)} (S≧2.5)
Price		Quotation

Stocks Availability Subjected to Prior Sales.

STRIPPER GUIDE BUSHINGS
—FOR BALL BEARING—

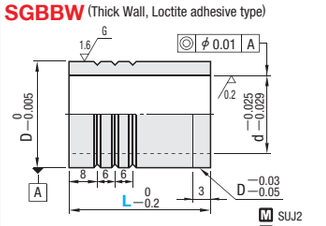
MORE ITEMS　SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS



SGBBW (Thick Wall, Loctite adhesive type)

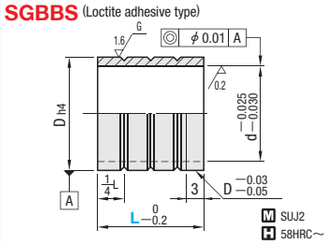


d	D		Catalog No. Type	PD	L	U/Price Q'ty：1～9
17	24	−0 −0.005	SGBBW	13	30 35	Quotation
20	28			16	35 40	
26	34			20	40 45 50	
31	40			25	45 50 60	

RoHS



SGBBS (Loctite adhesive type)

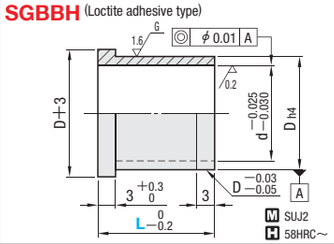


d	Dh4		Catalog No. Type	PD	L	U/Price Q'ty：1～9
14	18	−0 −0.005	SGBBS	10	20 25 30	Quotation
17	22			13	20 25 30	
20	26	−0 −0.006		16	25 30 35	
26	31			20	25 30 35 40	
31	37	−0 −0.007		25	35 40	

RoHS



SGBBH (Loctite adhesive type)



d	Dh4		Catalog No. Type	PD	L	U/Price Q'ty：1～9
14	18	−0 −0.005	SGBBH	10	20 25 30	Quotation
17	22			13	20 25 30	
20	26	−0 −0.006		16	25 30 35	
26	31			20	25 30 35 40	
31	37	−0 −0.007		25	35 40	

Order　Catalog No. — L　　SGBBW 16 — 35

Delivery　• Printed in Red　SGP Stock　• Printed in Blue　3 Days

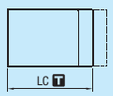
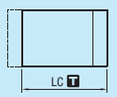
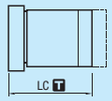
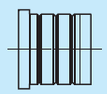
For area out of Singapore please refer to P.i.

Alteration　Catalog No. — L(LC)　　SGBBH 16 — LC25.5　　5 Days　Express T　Express A

For area out of Singapore please refer to P.i.

■Volume discount rate

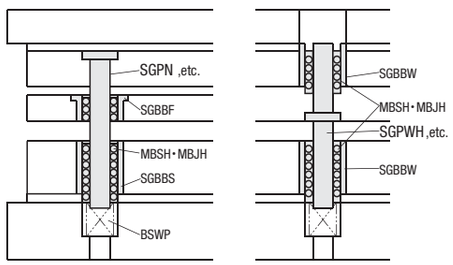
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

Alteration	Changes dimension L (full length)		Machines grooves for Loctite.
Code	LC	LC	DLC
Spec.	• SGBBW  PD 13 / LC 0.1mm increments 25.0≦LC＜L / 16 30.0≦LC＜L / 20 35.0≦LC＜L / 25 40.0≦LC＜L / T 0 −0.2	• SGBBS  • SGBBH  PD 10 / 13 / 16 / 20 / 25 / LC 0.1mm increments 15.0≦LC＜L / 15.0≦LC＜L / 20.0≦LC＜L / 20.0≦LC＜L / 30.0≦LC＜L / T 0 −0.2	Grooves for Loctite are made on the outside diameter of bushing.  ＊Number of outer diameter grooves 8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3 ⊗ Not applicable to SGBBW and SGBBS.
Price		Quotation	

Example

■Features

SGBBW	Thick wall results in a higher level of rigidity.
SGBBS SGBBH	All stripper guide pins can be coupled with. (Same in SGBBW.)

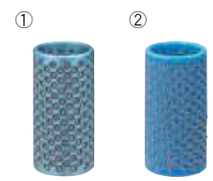


BALL BEARING CAGES / SPRINGS FOR BALL CAGE

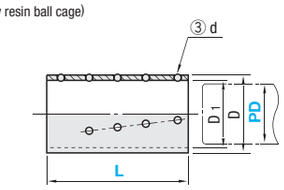
SGP Stock　Printed in Red

The volume discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

RoHS



① MBSH (High rigidity aluminum ball cage)
② MBJH (High rigidity resin ball cage)



M ①A5052S（Aluminum）
②POM（Polyacetal resin）
③SUJ2 Sphericity pressure 0.25 μm
H ③62～67HRC

D	D1	Diameter of ball d	Catalog No. Type	PD	L	U/Price Q'ty：1～9 MBSH	MBJH
13.7	10.3	2	MBSH (Aluminum) MBJH (Resin)	10	25 30 35	Quotation	
16.7	13.3	2		13	25 30 35		
19.7	16.3	2		16	30 35 40		
25.5	20.5	3		20	30 35 40 45		
30.5	25.5	3		25	35 40 45 50		

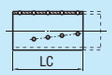
Order　Catalog No. — L　　MBJH 20 — 45

Delivery　• MBSH MBJH　SGP Stock　• Printed in Blue　3 Days

For area out of Singapore please refer to P.i.

Alteration　Catalog No. — L(LC)　　MBJH 20 — LC 42　　5 Days　Express A

For area out of Singapore please refer to P.i.

Alteration	Code	Spec.	Price
	LC	Changes dimension L (full length) 1mm increments 20≦LC＜L Ball holes may remain on the cut surface.	Quotation

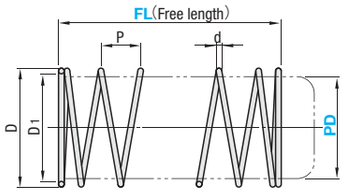
■Volume discount rate

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

RoHS



BSWP (Springs for ball cage)



M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	U/Price Q'ty：1～9
11.7	10.5	0.6	5	BSWP (For Ball cage)	10	30～80	Quotation
14.9	13.5	0.7	6		13	30～80	
18.3	16.5	0.8	12		16	30～90	
22.5	20.5	1.0	14		20	35～90	
27.9	25.5	1.2	14		25	40～90	

Order　Catalog No. — FL　　BSWP 20 — 80

Delivery　5 Days　Express T　Express A

For area out of Singapore please refer to P.i.

■Volume discount rate

Quantity	1～9	10～20
Rate	—	5%

Spring solid height (mm) / Spring constant (g/mm)

Type	PD	FL(Free length) 30	35	40	45	50	55	60	65	70	75	80	85	90
BSWP	10	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	—	—
		16	14	12	11	9	9	8	7	7	6	6		
	13	4.9	5.4	6.1	6.6	7.2	7.8	8.4	8.9	9.6	10.1	10.7	—	—
		17	15	13	11	10	9	8	8	7	7	6		
	16	3.2	3.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6	5.8	6.1	6.4
		32	26	23	22	20	19	16	15	14	13	12	12	11
	20	—	4.7	5.0	5.3	5.6	5.8	6.0	6.5	7.0	7.4	7.7	8.1	8.5
			40	35	31	28	26	23	22	20	19	18	16	15
	25	—	—	6.0	6.3	6.6	7.0	7.4	7.9	8.4	8.7	9.0	9.3	9.6
				38	34	30	28	25	24	22	20	19	18	17

Upper row：Solid height
Lower row：Spring constant