

GUIDE POSTS & BUSHINGS FOR DIE SETS

GUIDE POSTS & BUSHINGS FOR DIE SETS



| | | | | | | |
|-----------------------------|--|---------------------|--------------------------|------------------------|-----------------|--|
| Product name Catalog No. | ROLLER GUIDE POST SETS FOR DIE SETS RGLBL RGLSL RGKLL | ROLLER CAGES RBJ | MOVABLE STOPPERS RSTM | FIXED STOPPERS RSTK | SPRINGS RSWP | RINGS FOR PREVENTING CAGE LIFTING RWR |
| Page | 915 | 917 | 917 | 917 | 918 | 918 |



| | |
|--|--|
| BALL GUIDE POST SETS FOR HIGH-RIGIDITY DIE SETS —DETACHABLE POST TYPE— | BALL GUIDE POST SETS FOR DIE SETS —DETACHABLE POST TYPE— |
| RBSH QBSH RMSH QMSH RKSH QKSH | RB QB RM QM RK QK |
| 919 | 919 |



| | |
|---|---|
| BALL GUIDE POST SETS FOR HIGH-RIGIDITY DIE SETS —PRESS-FIT POST TYPE— | BALL GUIDE POST SETS FOR DIE SETS —PRESS-FIT POST TYPE— |
| PBSH GBSH PMSH GMSH PKSH GKSH | PB GB PM GM PK GK |
| 921 | 921 |



| | |
|------------------------------------|-----------------------------|
| PLAIN GUIDE POST SETS FOR DIE SETS | GUIDE POSTS FOR DIE SETS |
| RD RF RZ RFZ PD PF PZ PFZ | MRP BRPM BRPK MSP BSPM BSPK |
| 923 | 927 |



| | | | |
|--|--|--|--|
| GUIDE POSTS FOR DIE SETS —LONG TYPE, CONFIGURABLE FULL LENGTH— | BALL GUIDE BUSHINGS FOR DIE SETS —LONG TYPE, CONFIGURABLE FULL LENGTH— | BALL GUIDE BUSHINGS FOR DIE SETS —DETACHABLE TYPE— | BALL GUIDE BUSHINGS FOR LOWER DIE SETS |
| MRP BRPM BRPK MSP BSPM BSPK | MBB LBB | RBB | LBS |
| 929 | 931 | 932 | 933 |



| | | | | |
|-----------------|--|-------------------------|-----------------------|---------------------|
| SPRINGS SWPB | BALL CAGES FOR DIE SETS MBSH MBJH MBS MBJ | MOVABLE STOPPERS STM | FIXED STOPPERS STK | SPRINGS SWP SWPL |
| 933 | 934 | 935 | 935 | 935 |



| | | | | |
|--|--|---------------------------------------|-----------------------|------------------------|
| RINGS FOR PREVENTING CAGE LIFTING RWB | PLAIN GUIDE BUSHINGS FOR DIE SETS MDB LDB LFB LDBZ LFBZ | SHANKS FOR DIE SETS MSK MSKS MSKTP | MILLION GREASE MGS | DIE ADHESIVE LOC638 |
| 936 | 937 | 939 | 940 | 940 |

GUIDE POST SETS FOR DIE SETS

—GUIDE—

Comparison of roller guides, high-rigidity ball guides, ball guides, and plain guides (Excellent A ← → D Poor)

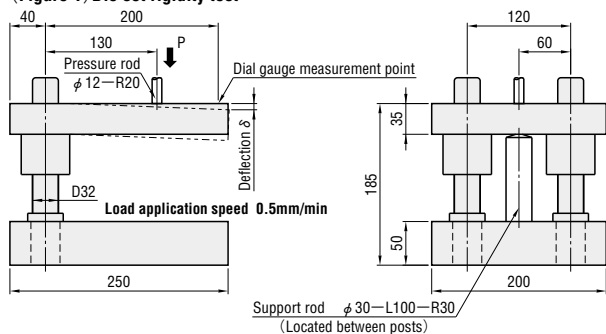
| Type | Item | Seizure resistance | Rigidity | Cost ratio※ | Max. allowable speed | | Recommended lubricant | |
|--------------------------|-------------------------------|--------------------|----------|-------------|----------------------|---------------|-----------------------|----------------------|
| | | | | | Oil type | Oil-free type | Oil | Grease |
| Roller guide | | A | B | 8.1 | A | — | — | — |
| High-rigidity ball guide | | A | C | 1.9 | A | — | — | — |
| Ball guide | | A | D | 1.8 | A | — | Bearing oil | — |
| Plain guide Guide | Copper alloy+MoS ₂ | B | A | 1.7 | B | C | ISO | Lithium type No.2 |
| | Copper alloy | B | A | 1.5 | C | — | VG68 | |
| | SUJ2+MoS ₂ | B | A | 1.4 | C | C | — | |
| Plain guide | | D | A | 1.0 | D | — | — | — |

※Cost ratio with 1 as the price of a detachable plain guide RD32-160.

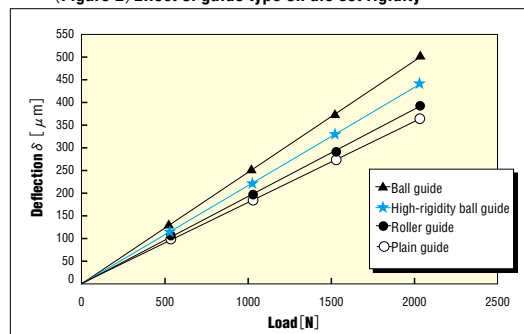
Effect of the guide type on die set rigidity

Figure 2 shows the rigidity provided by different guide types, examined using a back post type die set (Figure 1). Deflection δ of the die set increases in the following order: Plain < Roller < High-rigidity ball < Ball.

(Figure 1) Die set rigidity test

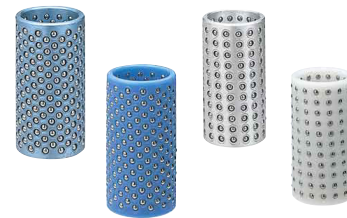


(Figure 2) Effect of guide type on die set rigidity



Comparison of ball cages

| Item | Aluminum cage [MBS·MBSH] | Resin cage [MBJ·MBJH] |
|-----------------------|---|--|
| Main uses | Sturdy aluminum ball cages are often used for die applications in which the guide posts and bushings are removed and inserted during pressing, or in which the workpiece is bent. | Resin cages are often used for precision dies and dies used at high speed. |
| Ball holding force | Large because aluminum is used. | Weaker than aluminum. |
| Strength of ball cage | Unbreakable but deforms when dropped. | May break when dropped. |
| Weight | Heavier than resin. | Can be used for high SPM due to its light weight. |
| Wear particles | Aluminum wear particles are produced. | Wear particles are unlikely. |



Features of various stopper systems

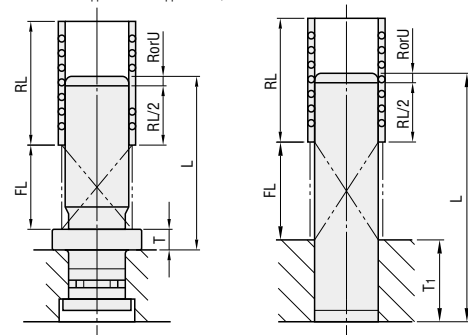
| | | |
|--|-----------------------------------|--|
| | No stopper | <ul style="list-style-type: none"> Not suitable for dies which require that posts and bushings be removed and inserted. Difficult to adjust the ball cage height when assembling. Because no stopper is present, can be used even for low shut-height dies. |
| | Movable stopper (RSTM·STM) | <ul style="list-style-type: none"> Ball cage height can be adjusted easily during assembly. Because the movable stopper lowers as the press lowers, can be used even for low shut-height dies. |
| | Fixed stopper (RSTK·STK) | <ul style="list-style-type: none"> The high stopper strength makes this type ideal for dies which require that posts and bushings be removed and inserted. Ball cage height can be adjusted easily during assembly. Because the stopper is fixed, this type is not suitable for low shut-height dies. |

Guideline for selecting spring length (FL)

Detachable type $FL = L - (T + (RorU) + RL/2)$ Press-fit type $FL = L - (T_1 + (RorU) + RL/2)$

L: Post length T: Flange thickness T₁: Die holder thickness
U: U of post R: R of post RL: Cage length

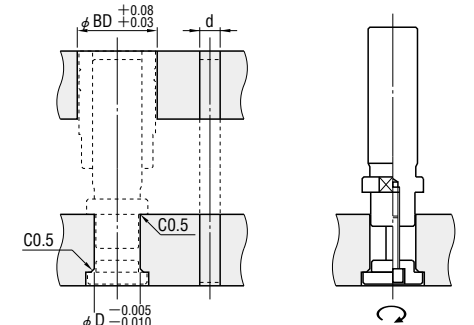
When a movable stopper or fixed stopper is used, FL should be 1.1 to 1.2 times the above calculation result.



Installing a guide post set

Machining the mounting holes for guide post and bushing

- Guide post and bushing mounting holes should be machined by boring or jig grinding after the machining of all other holes is completed and after any machining deformation removed (for example by regrinding the top and bottom surfaces).
- One method of creating a position reference for upper and lower dies is to create a dummy hole and insert a pin.



Machining of mounting hole

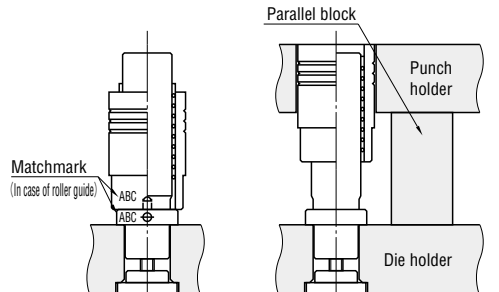
Installing guide post

Installing guide posts

- After cleaning the mounting hole, fix the guide post in place using a bolt.
- In the case of a roller guide post set, offsetting the reference plane of one guide post by 90° from the other posts helps prevent errors when the die set is assembled.
- Check the post perpendicularity (0.01mm/100mm or less)
- When press-fitting the post, use a hydraulic press or similar means and insert the post slowly. Tapping the post with a hammer may cause post bending or deformation.

Installing guide bushings

- Place the bushing onto the guide post. (For a roller guide, align the matchmark and symbol.)
- Place a parallel block on the die holder and place the punch holder on it.
- Slide the guide bushing to check for any interference.
- Use solvent to clean any oil or dirt from the contact surface, then apply an anaerobic adhesive agent (Loctite 638 ~~or~~ P.940 is recommended) into the guide bushing's adhesive groove, and insert the bushing into the mounting hole. Set the guide bushing so that it will not come out from the punch holder and allow the adhesive to harden under those conditions. (3 to 6 hours at normal temperatures)



Aligning the post and bushing

Installing guide bushing

Installing stoppers

- Movable stopper**...After the adhesive agent has completely hardened, insert the spring and cage, and tighten the hexagon shaft of movable stopper RSTM·STM using a spanner.
- Fixed stopper**...After the adhesive agent has completely hardened, insert the spring and cage, and attach the fixed stopper RSTK·STK.

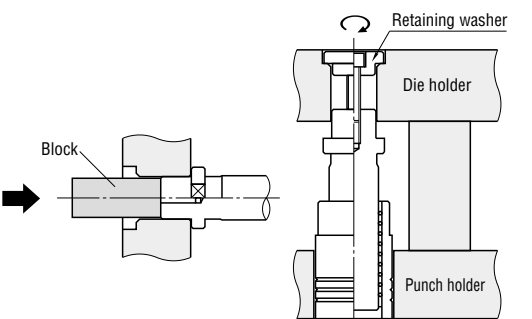
Removing and installing guide posts

Removing

- Remove the movable stopper, ball cage and spring from the guide post.
- Loosen the bolt and remove the retaining washer.
- In order to avoid damaging the internal surfaces of the mounting hole or tap holes, position a cushion block (such as a copper alloy block) and tap the block with a hammer to remove the guide post.

Installing

- Attach the spring, cage and movable stopper to the guide post, then insert the guide post into the guide bushing.
- Place a parallel block onto the punch holder and position the die holder on top of it so that the die holder does not contact the roller guide or ball guide.
- Slide each guide post up and down to check for any interference with the mounting hole. If necessary, adjust the punch holder position.
- After cleaning the mounting hole, fix the guide post in place using a bolt.



Removing post

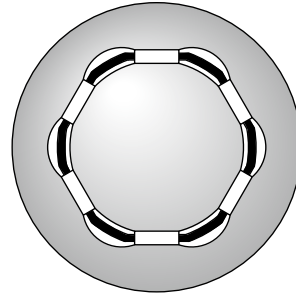
Installing post

ROLLER GUIDE POST SETS FOR DIE SETS

— GUIDE —

■ Features of roller guide

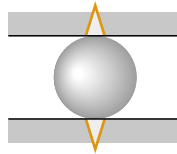
A roller guide has rollers positioned on 6 faces, producing a contact area that is several times larger than that of a ball guide, also provides rigidity that is nearly equivalent to a plain guide. This results in rigidity and accuracy that are not possible with ball guides. Roller guides not only improve the overall rigidity and straightness of the die set, they can also maintain smooth vertical strokes and stable accuracy over long periods of time. They also feature improved durability in response to high-speed intermittent operation and vibration.



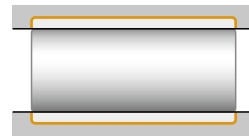
Changing from point contact to linear contact [Achievement of high rigidity]

A roller's contact surface area is approximately 10 times larger than that of a ball, and this results in a higher level of rigidity between the guide post and guide bushing when a roller guide is used.

The ball guide improves the rigidity by increasing the preload to 10 to 25 μm . However, the large preload causes a large thrust shock to the ball, resulting in vibration.



Because the contact is linear, the preload of the rollers is much smaller, at 4 to 12 μm . This contributes to smooth movement and reduced thrust shock.



■ Component names

① Guide bushing

Hardness: 60 ~ 62HRC
Raceway surface: Ra0.2 μm

④ Matchmark/symbol

When using the bushing, align the matchmarks on the bottom of the guide bushing and the side of the guide post flange, and be sure that the post and bushing symbols are matched.
(Concentricity when properly aligned: 3 μm or less)



② Roller cage

Single-piece structure
made of polyacetal

③ Guide post

Hardness: 60 ~ 62HRC
Raceway surface: Ra0.1 μm

⑤ Reference surface

Offsetting the reference surface of one guide post by 90° from the other posts helps prevent errors when the die set is assembled.

■ Applications

- Precision punch dies for ultra thin metal and resin materials
Switches, relay components, lead frames, printed circuits, films, etc.
- Punch dies for relatively thick materials
Motor components, connectors, fine blanking, etc.
- Guides for specialized machines and precision machines
For press units, positioning control, jigs, etc.

■ Accuracy standards for roller guides and die sets

| Inspection item | Measurement method | Tolerance | | | | |
|---|--------------------|--------------------------------------|----------------------|----------------|-------------|-------------|
| | | Reference surface | Upper/lower surfaces | Other surfaces | | |
| Surface roughness of holder | | $\sqrt{3.2}$ | $\sqrt{0.8}$ | | | |
| | | | | | | |
| Parallelism of upper/lower surfaces for punch holders and die holders | | Nominal size (length of longer side) | 100 or less | 200 or less | 300 or less | 600 or less |
| | | Accuracy | 0.004 | 0.008 | 0.01 | 0.015 |
| Perpendicularity of die holder bottom surface and guide post | | 0.01/100 or less | | | | |
| Parallelism after assembly | | Nominal size (length of longer side) | 100 or less | 200 or less | 300 or less | 600 or less |
| | | Accuracy | 0.008 | 0.012 | 0.02 | 0.025 |

[Notes]

- Select an appropriate guide post length so that the guide bushing will not separate from the guide post at top dead center during press processing.
- The minimum stroke of the roller guide must be equal to or larger than the roller diameter $\phi d \times \pi$. **P.917**
A stroke shorter than this will cause stress to be applied at certain rollers only; resulting in rapid deterioration of roller guide performance.
- Be sure to periodically lubricate the roller guide.
- If scraps or other debris collect in the roller guide, protect the guide using a cover.
- Do not modify the roller guide. (Doing so may make it impossible to achieve the designated accuracy and performance.)

ROLLER GUIDE POST SETS FOR DIE SETS

RGBL
(No stopper)



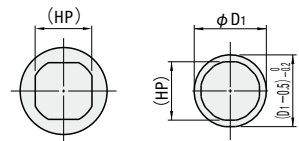
RGSL
(For movable stopper)



RGKL
(For fixed stopper)



RoHS



A square guide is used for D6, D9 and D16. A octagonal guide is used for D80 only.

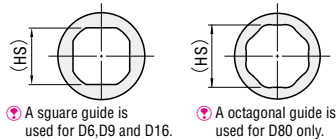
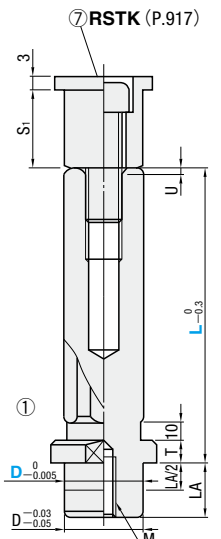
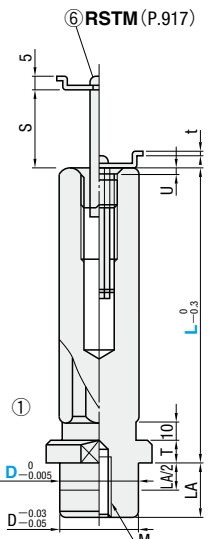
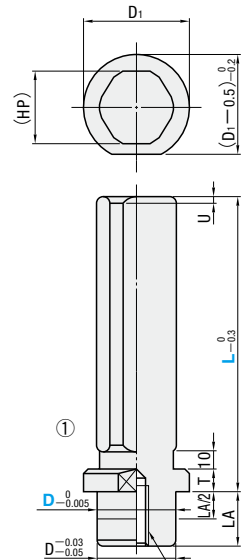
| Name | □ | ⬡ |
|--------------------|--------------------------|------------|
| ① Guide post | SKS3 | 60 ~ 62HRC |
| ② Retaining washer | S45C | — |
| ③ Guide bushing | SKS3 | 60 ~ 62HRC |
| ④ Roller cage | Polyacetal (Roller:SUJ2) | — |
| ⑤ Spring | SWP-B | — |
| ⑥ Movable stopper | S45C SPC-1 | — |
| ⑦ Fixed stopper | S45C | — |

Roller cage④, spring⑤, movable stopper⑥ and fixed stopper⑦ can be purchased individually.

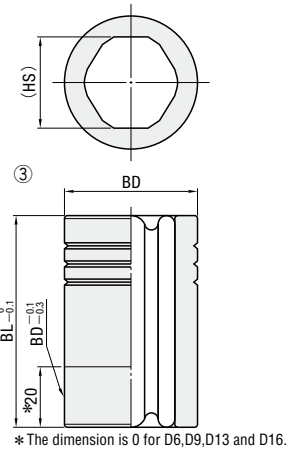
☞ P.917

| Catalog No. | Components | | | | | | |
|-------------|------------|---|---|---|---|---|---|
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| RGBL | ○ | ○ | ○ | ○ | ○ | — | — |
| RGSL | ○ | ○ | ○ | ○ | ○ | ○ | — |
| RGKL | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

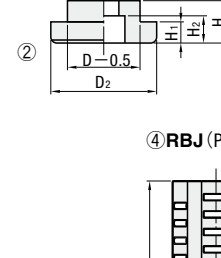
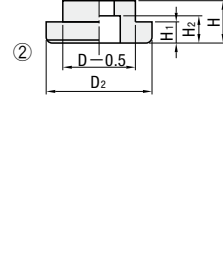
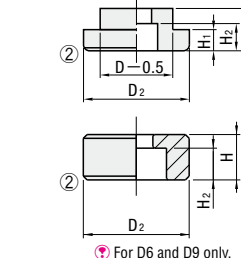
An accessory spring is not provided for D6.



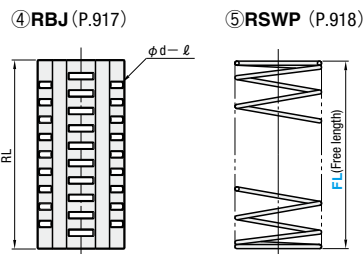
A square guide is used for D6, D9 and D16. A octagonal guide is used for D80 only.



* The dimension is 0 for D6, D9, D13 and D16.



For D6 and D9 only.



| D | Post | | | | | | | | | | | | | | Bushing | | | |
|----|----------------|----------------|----|----|----------------|----------------|------|-----|--------|---------------|-----|-----|----|----------------|---------|--------|------|-------------------|
| | D ₁ | D ₂ | LA | H | H ₁ | H ₂ | (HP) | T | M | Provided bolt | U | t | S | S ₁ | BD | BL | (HS) | Number of grooves |
| 6 | 9 | 9 | 6 | 5 | — | 3.4 | 4.7 | 2.5 | M3×6 | CB3×6 | 2.8 | — | — | — | 13 | 0 | 25 | 7.7 |
| 9 | 14 | 14 | 9 | 6 | — | 4.2 | 7.9 | 3.5 | M4×8 | CB4×8 | 3.5 | — | — | — | 17 | -0.005 | 30 | 10.9 |
| 13 | 19 | 17 | 12 | 7 | 3 | 5.5 | 11.2 | 5 | M5×8 | CB5×10 | 2.5 | — | — | — | 23 | 0 | 40 | 15.2 |
| 16 | 24 | 22 | 16 | 10 | 4 | 6.5 | 14.6 | 6 | M6×10 | CB6×10 | 4.3 | 1.2 | 11 | 14 | 30 | -0.006 | 40 | 18.6 |
| 20 | 29 | 28 | 16 | 14 | 7 | 8.5 | 18.8 | 8 | M8×20 | CB8×15 | 3.0 | 1.6 | 20 | 23 | 37 | 0 | 60 | 22.8 |
| 25 | 35 | 35 | 18 | 14 | 7 | 8.5 | 23.8 | | | | | | 25 | 28 | 45 | 0 | 70 | 27.8 |
| 28 | 37 | 36 | 20 | 16 | 8 | 10.5 | 26.6 | 10 | M10×20 | CB10×20 | 3.5 | 1.6 | 27 | 30 | 47 | -0.007 | 75 | 31.6 |
| 32 | 42 | 40 | 23 | 18 | 9 | 12.5 | 31.2 | | | | | | 28 | 31 | 55 | 0 | 78 | 36.2 |
| 40 | 54 | 50 | 35 | 18 | 9 | 12.5 | 39.1 | 12 | M12×30 | CB12×25 | 4.0 | 2.0 | 33 | 36 | 68 | 0 | 92 | 45.1 |
| 50 | 64 | 60 | 35 | 18 | 9 | 12.5 | 48.9 | | | | | | 35 | 38 | 80 | -0.008 | 96 | 54.9 |
| 60 | 74 | 72 | 42 | 20 | 12 | 14.5 | 59.1 | 15 | M14×30 | CB14×30 | 5.5 | — | 51 | 54 | 95 | 0 | 120 | 67.1 |
| 80 | 98 | 105 | 45 | 26 | 13 | 17.5 | 79.4 | | | | | | 51 | 54 | 95 | 0 | 120 | 67.1 |

| Catalog No. | Type | 5mm increments | | Base unit price 1 ~ 9 sets | |
|-------------|-------------------|----------------|----------|----------------------------|-----------|
| | | L | FL | RGBL | RGSL-RGKL |
| 6 | RGBL (No stopper) | 30 ~ 60 | — | | |
| 9 | RGBL (No stopper) | 50 ~ 80 | 30 ~ 60 | | |
| 13 | RGBL (No stopper) | 70 ~ 100 | 30 ~ 100 | | |
| 16 | RGBL (No stopper) | 75 ~ 100 | 30 ~ 110 | | |
| 20 | RGBL (No stopper) | 105 ~ 120 | 40 ~ 120 | | |
| 25 | RGBL (No stopper) | 125 ~ 140 | 60 ~ 140 | | |
| 28 | RGBL (No stopper) | 125 ~ 140 | 50 ~ 140 | | |
| 32 | RGBL (No stopper) | 145 ~ 160 | 70 ~ 155 | | |

Quotation

| Catalog No. | Type | 10mm increments | | Base unit price 1 ~ 9 sets | |
|-------------|-------------------|-----------------|-----------|----------------------------|-----------|
| | | L | FL | RGBL | RGSL-RGKL |
| 40 | RGBL (No stopper) | 120 ~ 140 | 70 ~ 200 | | |
| 50 | RGBL (No stopper) | 150 ~ 170 | 90 ~ 230 | | |
| 60 | RGBL (No stopper) | 180 ~ 200 | 70 ~ 210 | | |
| 80 | RGBL (No stopper) | 210 ~ 230 | 100 ~ 220 | | |

Quotation

An accessory spring is not provided for D6. D80 is available for RGBL, RGKL only.

Order Catalog No. — L — FL
RGBL 25 — 120 — FL80

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L(LC) — FL — (LAC)
RGBL 20 — LC78 — FL40

| Alteration | Code | Spec. | 1Code | |
|------------|----------------|----------------------|-----------|----------------|
| | LC | Post length L change | Quotation | |
| | | D | | 1mm increments |
| | | 6 | | 30 < LC < 60 |
| | | 9 | | 50 < LC < 80 |
| | | 13 | | 70 < LC < 120 |
| | | 16 | | 75 < LC < 135 |
| | | 20 | | 75 < LC < 140 |
| | | 25 | | 95 < LC < 160 |
| | | 28 | | 95 < LC < 160 |
| | | 32 | | 115 < LC < 180 |
| 40 | 120 < LC < 220 | | | |
| 50 | 150 < LC < 250 | | | |
| 60 | 150 < LC < 250 | | | |
| 80 | 180 < LC < 280 | | | |

| Alteration | Code | Spec. | 1Code |
|------------|------|-------------------------|-----------|
| | LAC | LA dimension change | Quotation |
| | | LA/2 + 1 ≤ LAC < LA | |
| | | 1mm increments | |
| | | Tap depth is shortened. | |

| Configurable guide post length type (long) | | | |
|--|------|----------------|-----------------|
| Catalog No. | Type | 5mm increments | 10mm increments |
| | | LC | FL |
| 20 | RGBL | 145 ~ 200 | 110 ~ 200 |
| 25 | RGBL | 165 ~ 200 | 120 ~ 190 |
| 28 | RGBL | 165 ~ 200 | 120 ~ 190 |
| 32 | RGBL | 185 ~ 240 | 140 ~ 230 |

Order Catalog No. — LC — FL
RGBL 25 — LC200 — FL160

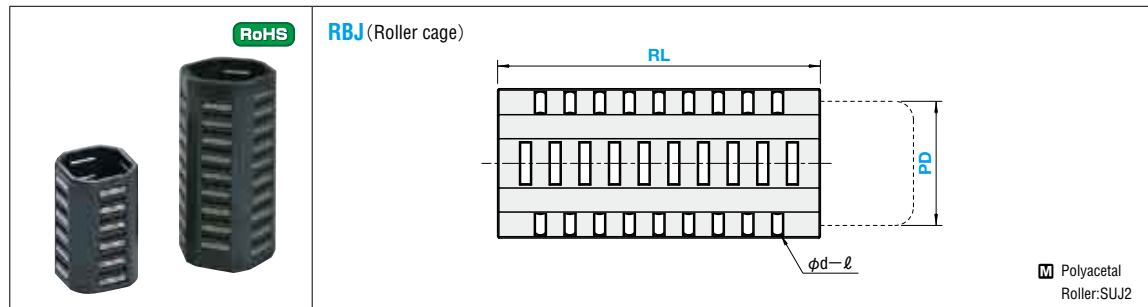
Days to Ship Quotation

Price Quotation

Assemble the set in accordance with "Accuracy standards for roller guides and die sets" on page 914.

ROLLER CAGES AND STOPPERS FOR ROLLER GUIDE POSTS

SPRINGS FOR ROLLER GUIDE POSTS / RINGS FOR PREVENTING CAGE LIFTING

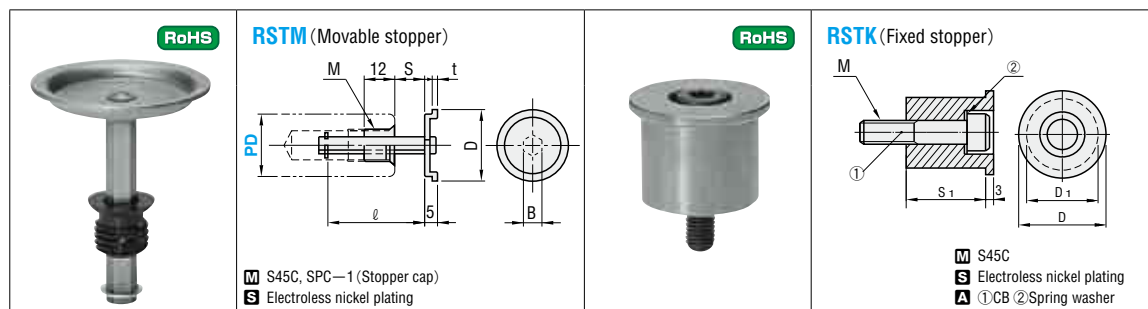


| d | ℓ | Number of rollers | Catalog No. | | RL | Base unit price 1 ~ 9 pieces |
|-----|------|-------------------|-------------|----|-----|---------------------------------|
| | | | Type | PD | | |
| 1.5 | 3.5 | 20 | RBJ | 6 | 20 | Quotation |
| 1.5 | 4.8 | 26 | | 9 | 25 | |
| | 4.8 | 45 | | 13 | 30 | |
| 2.0 | 6.8 | 24 | | 16 | 30 | |
| | | 57 | | 20 | 52 | |
| | | 69 | | 25 | 62 | |
| 2.5 | 7.8 | 57 | | 28 | 66 | |
| | | 69 | | 32 | 68 | |
| | | 75 | | 40 | 78 | |
| 3.0 | 9.8 | 78 | | 50 | 82 | |
| 4.0 | 13.8 | 84 | | 60 | 116 | |
| 4.0 | 13.8 | 124 | | 80 | 130 | |

Order **Catalog No.** — **RL**
RBJ 20 — 52

Price **Quotation**

Days to Ship **Quotation**



| PD | D | M×P | RSTM | | | | RSTK | | | Catalog No. | | Base unit price 1 ~ 9 pieces | |
|----|------|--------|--------|----|-----|------|----------------|----------------|---------------|---------------------------|-----|---------------------------------|-------------------|
| | | | S | ℓ | t | B | D ₁ | S ₁ | Provided bolt | Type | PD | | RL Cage length |
| 16 | 17.5 | 8×1.25 | 0 ~ 9 | 21 | 1.2 | 4 | 14.4 | 14 | M 8×20 | RSTM (Movable stopper) | 16 | 30 | Quotation |
| 20 | 21 | 10×1.5 | 0 ~ 20 | 32 | 1.6 | 5 | 18 | 23 | M10×25 | | | | |
| 25 | 26 | 12×1.5 | 0 ~ 25 | 37 | | 6 | 23 | 28 | M12×35 | | | | |
| 28 | 29 | | 0 ~ 27 | 39 | | 25.5 | 30 | 30 | 31 | | | | |
| 32 | 34 | 16×1.5 | 0 ~ 28 | 40 | 2.0 | 8 | 38 | 36 | M16×40 | | | | |
| 40 | 43 | | 0 ~ 33 | 45 | | 47.5 | 38 | 50 | 82 | | | | |
| 50 | 52.5 | | 0 ~ 35 | 47 | | 57.5 | 54 | 60 | 116 | | | | |
| 60 | 64.5 | 16×2.0 | 0 ~ 51 | 63 | — | 79 | 62 | M16×70 | 80 | | 130 | | |
| 80 | 86 | | — | — | | — | — | — | — | | — | — | |

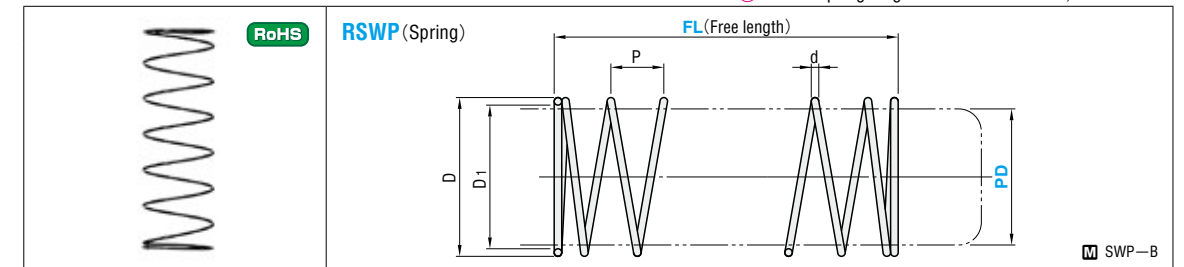
Order **Catalog No.** — **RL**
RSTM 20 — 52

Price **Quotation**

Days to Ship **Quotation**

PD80 is available for RSTK.

For the spring length selection standards, refer to P.911

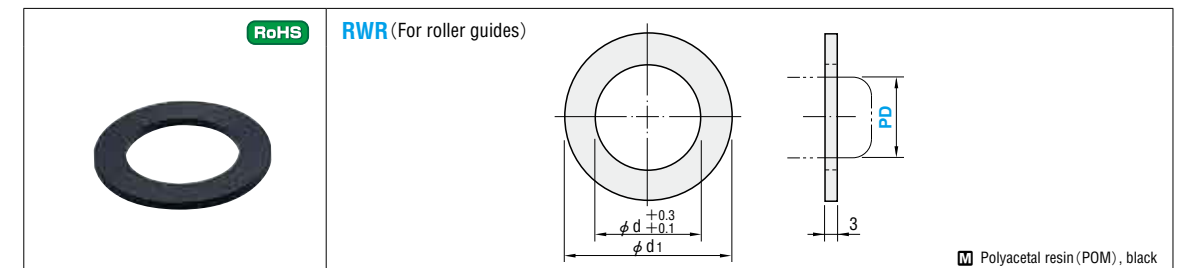


| D | D ₁ | d | P | Catalog No. | | Base unit price 1 ~ 9 pieces | |
|------|----------------|-----|----|-------------|-----------|---------------------------------|-----------|
| | | | | Type | FL | | |
| 10.7 | 9.3 | 0.7 | 4 | RSWP | 9 | 30 ~ 60 | Quotation |
| 14.1 | 12.5 | 0.8 | 8 | | 13 | 30 ~ 80 | |
| | | | | | | 85 ~ 100 | |
| 17.9 | 16.3 | 0.9 | 12 | | 16 | 30 ~ 80 | |
| | | | | | | 85 ~ 110 | |
| 22.1 | 20.3 | 1.0 | 14 | | 20 | 35 ~ 80 | |
| | | | | | | 85 ~ 120 | |
| | | | | | | 130 ~ 200 | |
| 27.2 | 25.4 | 1.1 | 15 | | 25 | 40 ~ 80 | |
| | | | | | | 85 ~ 140 | |
| 30.0 | 28.0 | 1.2 | 17 | | 28 | 50 ~ 80 | |
| | | | | | | 85 ~ 140 | |
| 34.9 | 32.5 | 1.3 | 20 | | 32 | 70 ~ 120 | |
| | | | | | | 125 ~ 155 | |
| 43.9 | 40.7 | 1.4 | 25 | | | 160 ~ 210 | |
| | | | | | | 70 ~ 140 | |
| 53.8 | 50.6 | 1.5 | 25 | 40 | 150 ~ 210 | | |
| | | | | | 90 ~ 140 | | |
| 65.7 | 60.5 | 1.6 | 30 | 50 | 150 ~ 230 | | |
| | | | | | 70 ~ 140 | | |
| 86.6 | 81 | 1.7 | 35 | 60 | 150 ~ 210 | | |
| | | | | | 100 ~ 150 | | |
| | | | | 80 | 160 ~ 220 | | |

Order **Catalog No.** — **FL**
RSWP 20 — 90

Price **Quotation**

Days to Ship **Quotation**



| Inner diameter d | Outer diameter d ₁ | Catalog No. | | Base unit price 1 ~ 9 pieces |
|---------------------|----------------------------------|---------------------------|----|---------------------------------|
| | | Type | PD | |
| 20.1 | 35 | RWR (For roller guide) | 20 | Quotation |
| 25.2 | 40 | | 25 | |
| 27.6 | 45 | | 28 | |
| 32.3 | 50 | | 32 | |
| 40.2 | 60 | | 40 | |
| 50.3 | 75 | | 50 | |
| 60.5 | 85 | | 60 | |
| | | | | |

Order **Catalog No.** — **Features** P.936
RWR 25

Days to Ship **Quotation**

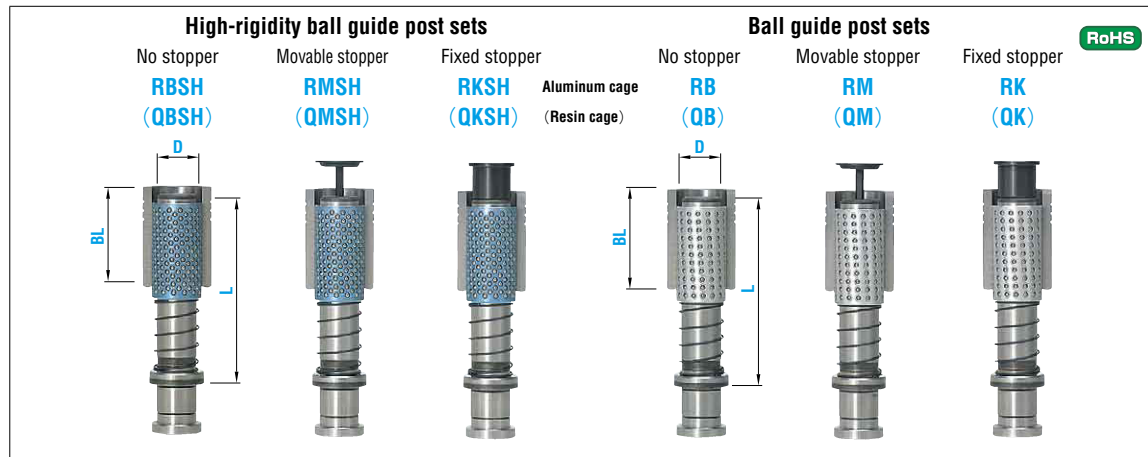
Price **Quotation**

BALL GUIDE POST SETS FOR DIE SETS

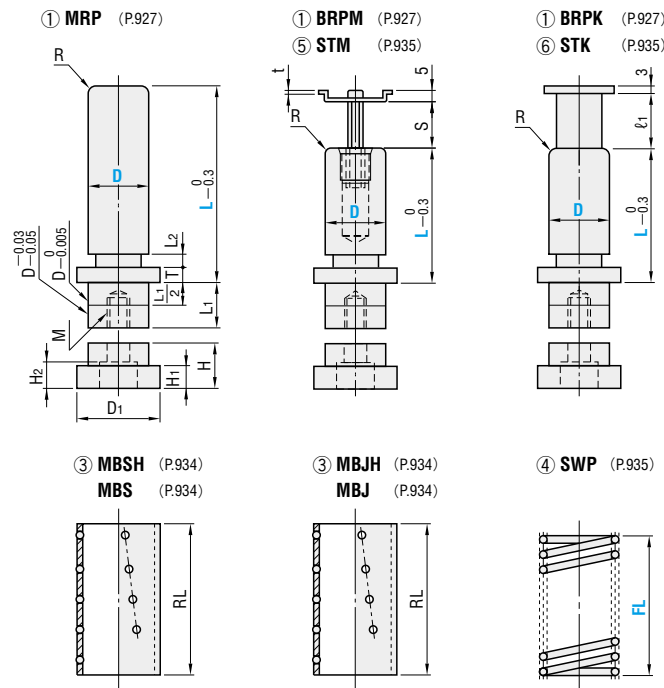
—DETACHABLE POST TYPE—



※When ordering by set, only the standard dimensions are available.
If dimensions other than standards are required, order alterations
(P.927 ~ 929) to individual parts.



| Catalog No. | Components | | | | | |
|-------------|------------|------------|------|-----|-----|-----|
| | ① | ② | ③ | ④ | ⑤ | ⑥ |
| RBSH | MRP | | | | | |
| RMSH | BRPM | | MBSH | | STM | |
| RKSH | BRPK | | MBSH | SWP | | STK |
| QBSH | MRP | MBB LBB | | | | |
| QMSH | BRPM | | MBJH | | STM | |
| QKSH | BRPK | | | | | STK |
| RB | MRP | | MBS | | | |
| RM | BRPM | | MBS | | STM | |
| RK | BRPK | | MBS | SWP | | STK |
| QB | MRP | MBB LBB | | | | |
| QM | BRPM | | MBJ | | STM | |
| QK | BRPK | | | | | STK |



| MRP·BRPM·BRPK | | | | | | | | | | | | | MBB·LBB | | | | RL | S | ℓ ₁ | | |
|---------------|----------------|----------------|----------------|----|----------------|----------------|------|----|-----|----|---------------|---------|--------------------------------|------------------|------------------|----|--------|----|----------------|-----|--|
| D | D ₁ | L ₁ | L ₂ | H | H ₁ | H ₂ | T | t | M | R | Provided bolt | d | D ₁ -D ₂ | D ₁ □ | D ₂ □ | 50 | 60 | 75 | 90 | 110 | |
| 20 | +0.020 | 28 | 15 | 10 | 14 | 7 | 8.5 | 8 | 1.6 | 8 | 2.0 | CB8—25 | 26 | 37 | 0 | 0 | 0 ~ 19 | 15 | | | |
| 22 | +0.015 | 30 | 16 | | | | | | | | | | 31 | 45 | | 0 | 0 ~ 23 | 20 | | | |
| 25 | | 35 | 18 | | | | | | | | | | 36 | 50 | | 0 | 0 ~ 30 | 25 | | | |
| 28 | +0.025 | 36 | 20 | 12 | 16 | 8 | 10.5 | 10 | 2.0 | 10 | 3.5 | CB10—30 | 36 | 50 | -0.007 | 0 | 0 ~ 37 | 30 | | | |
| 32 | +0.020 | 40 | 23 | | | | | | | | | | 40 | 55 | | 0 | 0 ~ 47 | 35 | | | |
| 38 | +0.030 | 49 | 27 | | | | | | | | | | 48 | 64 | | 0 | | | | | |
| 45 | +0.025 | 55 | 32 | 15 | 18 | 10 | 12.5 | 12 | 2.0 | 12 | 4.0 | CB12—35 | 55 | 74 | -0.008 | 0 | | | | | |
| 50 | +0.035 | 62 | 35 | | | | | | | | | | 60 | 83 | | 0 | | | | | |
| 60 | +0.030 | 72 | 42 | | | | | | | | | | 70 | 95 | | 0 | | | | | |

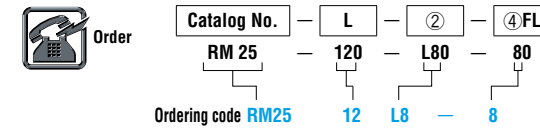
■Installing the bushing (Adhesives P.940)

| | | |
|-----|------------------|-------------------------|
| MBB | Devcon adhesive | — |
| LBB | Loctite adhesive | Loctite No.638 (LOC638) |

■About high-rigidity ball guide post sets

These products utilize a high-rigidity ball cage (MBSH, MBJH) containing approximately 1.6 times more balls, achieving rigidity that is nearly equivalent to that of a plain guide at low cost.

| Catalog No. | Type | D | L | | | | | ② MBB·LBB | | RL | FL 10mm increments |
|-------------|------------|-----|------|-----|-----|-----|-----|-----------|----------|----------|-----------------------|
| | | | Type | BL | 50 | 60 | 75 | 100 | 110 | | |
| RBSH | M (MBB) | 20 | 80 | 90 | 100 | 110 | 120 | 50 | 50 | 40 ~ 140 | |
| RMSH | | 22 | 80 | 90 | 100 | 110 | 120 | 50 | 50 | 40 ~ 140 | |
| RKSH | | 25 | 80 | 90 | 100 | 110 | 120 | 60 | 60 | 40 ~ 150 | |
| QBSH | | | 80 | 90 | 100 | 110 | 120 | 60 | 60 | 40 ~ 150 | |
| QMSH | | 28 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 50 ~ 150 | |
| QKSH | | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 50 ~ 150 | |
| RB | | 32 | 120 | 130 | 140 | 150 | 160 | 75 | 75 | 70 ~ 190 | |
| RM | | | 120 | 130 | 140 | 150 | 160 | 75 | 75 | 70 ~ 190 | |
| RK | | 38 | 140 | 150 | 160 | 170 | 180 | 90 | 90 | 80 ~ 190 | |
| QB | | | 140 | 150 | 160 | 170 | 180 | 90 | 90 | 80 ~ 190 | |
| QM | | 50 | 160 | 170 | 180 | 200 | | 100 | 110 | 80 ~ 190 | |
| QK | | | 160 | 170 | 180 | 200 | | 100 | 110 | 80 ~ 190 | |
| | L (LBB) | 50 | 160 | 170 | 180 | 200 | 100 | 110 | 80 ~ 190 | | |
| | | 60 | 160 | 170 | 180 | 200 | 100 | 110 | 80 ~ 190 | | |
| | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 80 ~ 190 | | |
| | | 120 | 110 | 120 | 130 | 140 | 150 | 160 | 80 ~ 190 | | |



| Type | M | S |
|------|-----------|---|
| MRP | M SUJ2 | M S45C (Cap) |
| BRPM | S 58HRC ~ | (Induction hardening) |
| BRPK | M S45C | S Black oxide (Fe ₃ O ₄) |
| STM | M S45C | S Black oxide (Fe ₃ O ₄) |
| STK | M S45C | S Black oxide (Fe ₃ O ₄) |
| | | Accessories CB |

| Type | M | S |
|------|--------------------|---|
| MBB | M SUJ2 | |
| LBB | S 58HRC ~ | |
| MBSH | M A5056 (Aluminum) | |
| MBS | M A5056 (Aluminum) | |

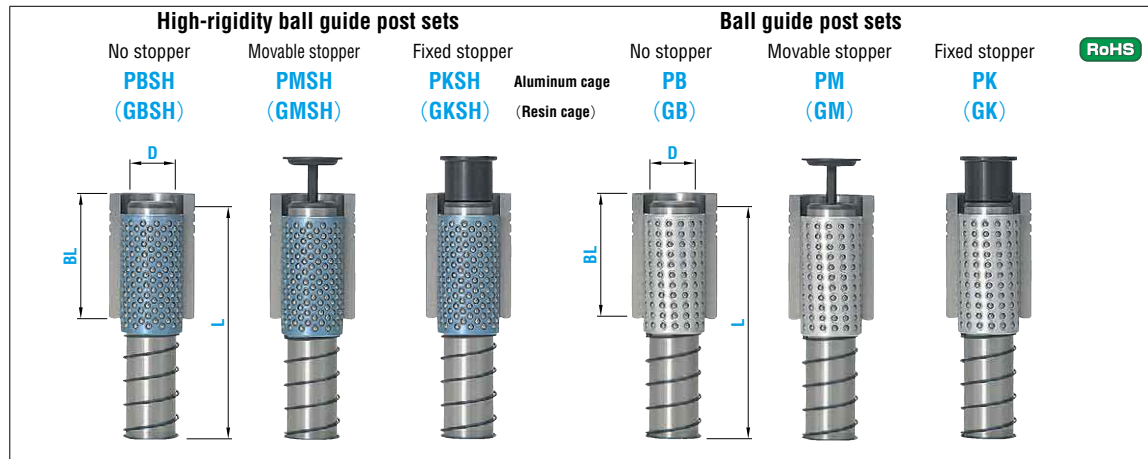
| Type | M |
|------|--------------------------|
| MBJH | M Polyacetal resin (POM) |
| MBJ | M Polyacetal resin (POM) |
| SWP | M SWP—B |

BALL GUIDE POST SETS FOR DIE SETS

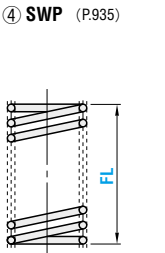
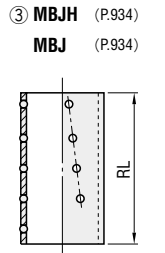
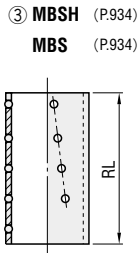
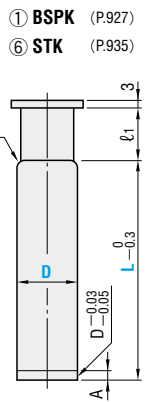
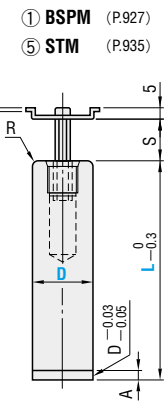
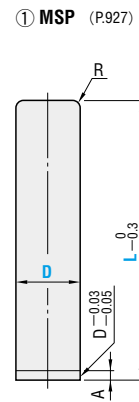
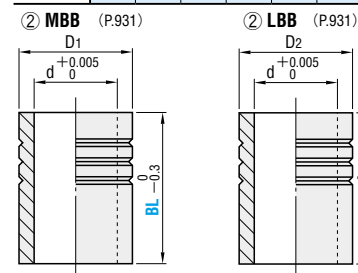
—PRESS-FIT POST TYPE—



※When ordering by set, only the standard dimensions are available.
If dimensions other than standards are required, order alterations
(☎P.927 ~ 929) to individual parts.



| Catalog No. | Components | | | | | |
|-------------|------------|------|------|-----|-----|-----|
| | ① | ② | ③ | ④ | ⑤ | ⑥ |
| PBSH | MSP | | | | | |
| PMSH | BSPM | | MBSH | | STM | |
| PKSH | BSPK | MBSH | | SWP | | STK |
| GBSH | MSP | MBSH | | | | |
| GMSH | BSPM | MBSH | | STM | | |
| GKSH | BSPK | | | | | STK |
| PB | MSP | | MBSH | | | |
| PM | BSPM | | MBSH | | STM | |
| PK | BSPK | MBSH | | SWP | | STK |
| GB | MSP | MBSH | | | | |
| GM | BSPM | MBSH | | STM | | |
| GK | BSPK | | | | | STK |



| MSP · BSPM · BSPK | | | | |
|-------------------|--------|---|-----|-----|
| D | A | R | t | |
| 20 | +0.020 | 4 | 2.0 | 1.6 |
| 22 | +0.015 | 4 | 3.0 | |
| 25 | +0.015 | 4 | 3.0 | |
| 28 | +0.025 | 5 | 3.5 | 2.0 |
| 32 | +0.020 | 5 | 3.5 | |
| 38 | +0.030 | 6 | 4.0 | |
| 45 | +0.025 | 6 | 4.0 | 2.0 |
| 50 | +0.035 | 7 | 5.0 | |
| 60 | +0.030 | 7 | 5.0 | |

| MBB · LBB | | | | |
|-----------|---------|----|----|------|
| d | D1 · D2 | D1 | D2 | |
| 26 | 37 | | | +0.5 |
| 28 | 40 | | | |
| 31 | 45 | | | |
| 36 | 50 | | | +0.3 |
| 40 | 55 | | | |
| 48 | 64 | | | |
| 55 | 74 | | | 0 |
| 60 | 83 | | | |
| 70 | 95 | | | |

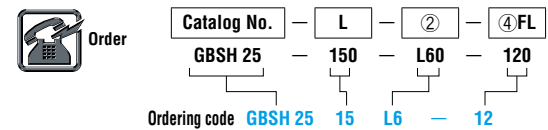
| RL | S | ℓ1 |
|-----|--------|----|
| 50 | 0 ~ 19 | 15 |
| 60 | 0 ~ 23 | 20 |
| 75 | 0 ~ 30 | 25 |
| 90 | 0 ~ 37 | 30 |
| 110 | 0 ~ 47 | 35 |

■ Installing the bushing (Adhesives ☎ P.940)

| | | |
|-----|------------------|-------------------------|
| MBB | Devcon adhesive | — |
| LBB | Loctite adhesive | Loctite No.638 (LOC638) |

■ About high-rigidity ball guide post sets
These products utilize a high-rigidity ball cage (MBSH, MBJH) containing approximately 1.6 times more balls, achieving rigidity that is nearly equivalent to that of a plain guide at low cost.

| Catalog No. | Type | D | L | | | | | | | | ② MBB · LBB | | RL | FL 10mm increments |
|-------------|---------|----|-----|-----|-----|-----|-----|-----|-----|----------|-------------|----------|----------|-----------------------|
| | | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | Type | | |
| PBSH | M (MBB) | 20 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 50 | 50 | 40 ~ 140 |
| PMSH | | 22 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 50 | 50 | 40 ~ 140 | | |
| PKSH | | 60 | 25 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 60 | 60 | 40 ~ 150 | |
| GBSH | | | | | | | | | | | 80 | 75 | | |
| GMSH | | 60 | 28 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 60 | 60 | 50 ~ 150 | |
| GKSH | | | | | | | | | | | 80 | 75 | | |
| PB | | 60 | 32 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 100 | 90 | 70 ~ 190 | |
| PM | | | | | | | | | | | 80 | 75 | | |
| PK | | 60 | 38 | 180 | 190 | 200 | 220 | 240 | 260 | 100 | 90 | 80 ~ 190 | | |
| GB | | | | | | | | | | 120 | 110 | | | |
| GM | | 60 | 50 | 200 | 220 | 240 | 260 | 100 | 90 | 80 ~ 190 | | | | |
| GK | | | | | | | | 120 | 110 | | | | | |
| | | | | | | | | | | 100 | 90 | 80 ~ 190 | | |
| | | | | | | | | | | 120 | 110 | 80 ~ 190 | | |



| Type | MS |
|------|--|
| MSP | M SUJ2 M S45C (Cap) |
| BSPM | S 58HRC ~ (Induction hardening) |
| BSPK | M S45C |
| STM | S Black oxide (Fe3O4) |
| STK | M S45C S Black oxide (Fe3O4) Accessories CB |

| Type | M |
|------|--------------------|
| MBB | M SUJ2 |
| LBB | S 58HRC ~ |
| MBSH | M A5056 (Aluminum) |
| MBS | |

| Type | M |
|------|--------------------------|
| MBJH | M Polyacetal resin (POM) |
| MBJ | |
| SWP | M SWP-B |

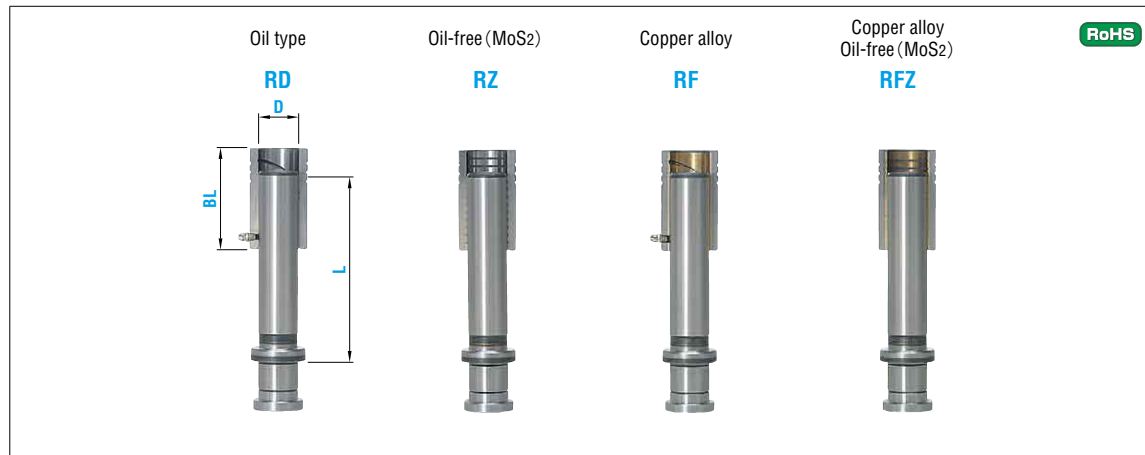
GUIDE POSTS & BUSHINGS FOR DIE SETS

PLAIN GUIDE POST SETS FOR DIE SETS

— DETACHABLE POST TYPE —



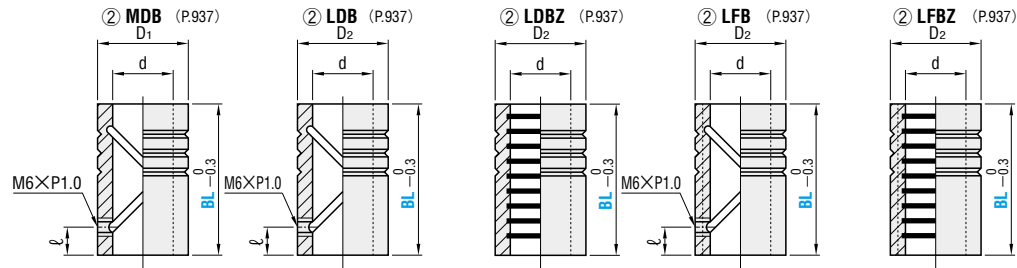
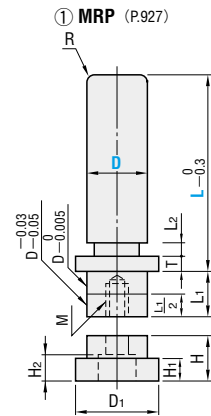
※ When ordering by set, only the standard dimensions are available. If dimensions other than standards are required, order alterations (P.927 ~ 929) to individual parts.



| Catalog No. | Components | |
|-------------|------------|------|
| | ① | ② |
| RD | MRP | MDB |
| RZ | | LDB |
| RF | | LDBZ |
| RFZ | | LFB |
| | | LFBZ |

■ Installing the bushing (Adhesives P.940)

| Component | Adhesive | Notes |
|-----------|------------------|-------------------------|
| MDB | Devcon adhesive | — |
| LDB | Loctite adhesive | Loctite No.638 (LOC638) |
| LDBZ | | |
| LFB | | |
| LFBZ | | |

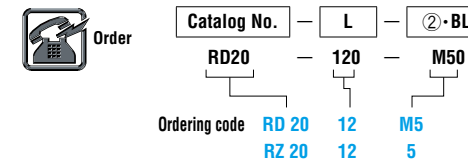


| MRP | | | | | | | | | | | |
|-----|----------------|----------------|----------------|----|----------------|----------------|-----|----|-----|---------------|---------|
| D | D ₁ | L ₁ | L ₂ | H | H ₁ | H ₂ | T | M | R | Provided bolt | |
| 20 | +0.020 | 28 | 15 | 10 | 14 | 7 | 8.5 | 8 | 8 | 2.0 | CB 8—25 |
| 22 | +0.015 | 30 | 16 | | | | | | | | |
| 25 | | 35 | 18 | | | | | | | | |
| 28 | +0.025 | 36 | 20 | 16 | 8 | 10.5 | 10 | 10 | 3.5 | CB10—30 | |
| 32 | +0.020 | 40 | 23 | | | | | | | | |
| 38 | +0.030 | 49 | 27 | | | | | | | | |
| 45 | +0.025 | 55 | 32 | 18 | 10 | 12.5 | 12 | 12 | 4.0 | CB12—35 | |
| 50 | +0.035 | 62 | 35 | | | | | | | | |
| 60 | +0.030 | 72 | 42 | | | | | | | | |

| ℓ | d | MDB | | LDB·LDBZ·LFB·LFBZ | |
|----|----|----------------|----------------|-------------------|----------------|
| | | D ₁ | D ₂ | D ₁ | D ₂ |
| 10 | 20 | +0.027 | 31 | +0.5 | 31 |
| | 22 | +0.022 | 34 | | |
| | 25 | | 37 | | |
| 15 | 28 | +0.032 | 42 | +0.3 | 42 |
| | 32 | +0.027 | 46 | | |
| | 38 | +0.037 | 54 | | |
| 15 | 45 | +0.040 | 62 | 0 | 62 |
| | 50 | +0.045 | 70 | | |
| | 60 | +0.040 | 80 | | |

| Type | Material |
|------------|--|
| MRP | M SUJ2 |
| | H 58HRC ~ (Induction hardening) |
| | M S45C (Cap) A Cap screw CB |
| MDB LDB | M SUJ2 |
| | H 58HRC ~ |
| | A Grease nipple GPA6A |
| LDBZ | M SUJ2 |
| | MoS ₂ (embedded) H 58HRC ~ |
| LFB | M SUJ2·Copper alloy |
| | H 45HRC ~ |
| | A Grease nipple GPA6A |
| LFBZ | M SUJ2·Copper alloy |
| | MoS ₂ (embedded) H 45HRC ~ |

| Catalog No. | | L | | | | | | | | | | RD Type | BL |
|-----------------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|---------|------------------------------|--------|
| Type | D | 80 | 90 | 100 | 110 | 120 | | | | | | ② | |
| RD RZ RF RFZ | 20 | 80 | 90 | 100 | 110 | 120 | | | | | | M (MDB) L (LDB) | 50 |
| | 22 | 80 | 90 | 100 | 110 | 120 | | | | | | | 50 60 |
| | 25 | 80 | 90 | 100 | 110 | 120 | 130 | | | | | | 60 80 |
| | 28 | | | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | | 60 80 |
| | 32 | | | | | | 120 | 130 | 140 | 150 | 160 | | 80 100 |
| RD RZ | 38 | | | | | | 140 | 150 | 160 | 170 | 180 | 80 100 | |
| | 45 | | | | | | 140 | 150 | 160 | 170 | 180 | 100 120 | |
| | 50 | | | | | | 160 | 170 | 180 | 200 | 100 120 | | |
| RD | 60 | | | | | | 160 | 170 | 180 | 200 | 100 120 | | |

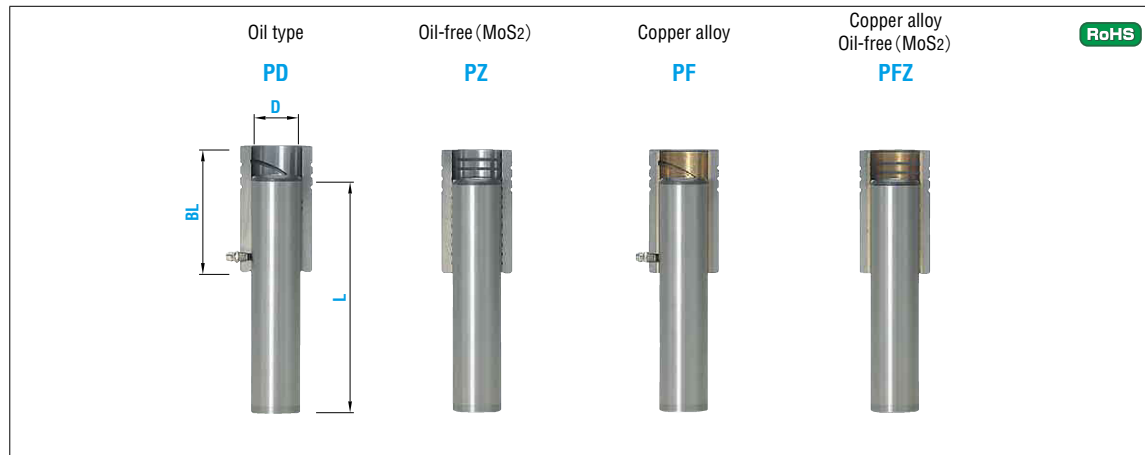


PLAIN GUIDE POST SETS FOR DIE SETS

—PRESS-FIT POST TYPE—



※When ordering by set, only the standard dimensions are available.
If dimensions other than standards are required, order alterations
(☞ P.927 ~ 929) to individual parts.

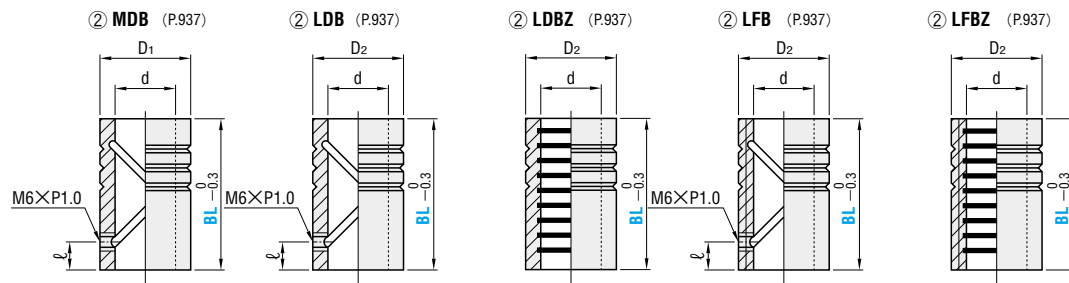
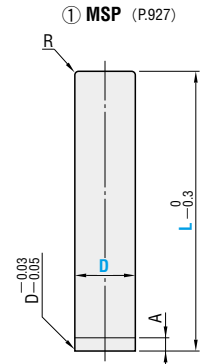


RoHS

| Catalog No. | Components | |
|-------------|------------|------|
| | ① | ② |
| PD | MSP | MDB |
| PZ | | LDB |
| PF | | LDBZ |
| PFZ | | LFB |
| | | LFBZ |

■Installing the bushing (Adhesives ☞ P.940)

| Component | Adhesive | Adhesive No. |
|-----------|------------------|-------------------------|
| MDB | Devcon adhesive | — |
| LDB | Loctite adhesive | Loctite No.638 (LOC638) |
| LDBZ | | |
| LFB | | |
| LFBZ | | |



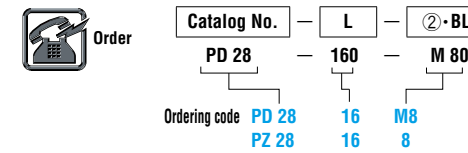
| MSP | | | |
|-----|--------|---|-----|
| D | A | R | |
| 20 | +0.020 | 4 | 2.0 |
| 22 | +0.015 | | 3.0 |
| 25 | | 5 | 3.5 |
| 28 | +0.025 | | |
| 32 | +0.020 | 6 | 4.0 |
| 38 | +0.030 | | |
| 45 | +0.025 | 7 | 4.5 |
| 50 | +0.035 | | |
| 60 | +0.030 | | |

| ℓ | d | MDB | | LDB·LDBZ·LFB·LFBZ | |
|----|----|-----|----|-------------------|-------------|
| | | D1 | D2 | D1 | D2 |
| 10 | 20 | 31 | 31 | +0.5 +0.3 | 0 -0.007 |
| | 22 | 34 | 34 | | |
| | 25 | 37 | 37 | | |
| | 28 | 42 | 42 | | |
| 15 | 32 | 46 | 46 | 0 -0.008 | 0 -0.010 |
| | 38 | 54 | 54 | | |
| | 45 | 62 | 62 | | |
| | 50 | 70 | 70 | | |
| | 60 | 80 | 80 | | |

| Type | Material |
|------|---|
| MSP | SUJ2 58HRC ~ (Induction hardening) |
| MDB | SUJ2 |
| LDB | 58HRC ~ Grease nipple GPA6A |
| LDBZ | SUJ2 MoS ₂ (embedded) 58HRC ~ |
| LFB | SUJ2·Copper alloy 45HRC ~ Grease nipple GPA6A |
| LFBZ | SUJ2·Copper alloy MoS ₂ (embedded) 45HRC ~ |

| Catalog No. Type | D | L | | | | | | | | | | | | | | | | PD Type ② | BL |
|---------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--------------|-----|
| | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | | | | |
| PD | 20 | | | | | | | | | | | | | | | | | M (MDB) | 50 |
| PZ | 22 | | | | | | | | | | | | | | | | | | 50 |
| PF | 25 | | | | | | | | | | | | | | | | | | 60 |
| PFZ | 28 | | | | | | | | | | | | | | | | | | 60 |
| | 32 | | | | | | | | | | | | | | | | | L (LDB) | 80 |
| PD | 38 | | | | | | | | | | | | | | | | | | 80 |
| PZ | 45 | | | | | | | | | | | | | | | | | | 100 |
| PD | 60 | | | | | | | | | | | | | | | | | | 100 |

☞ Specify for PD type only



Days to Ship **Quotation**

Price **Quotation**

GUIDE POSTS FOR DIE SETS

RoHS

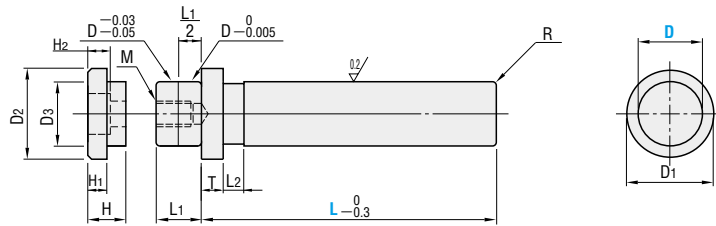
—Detachable post type—



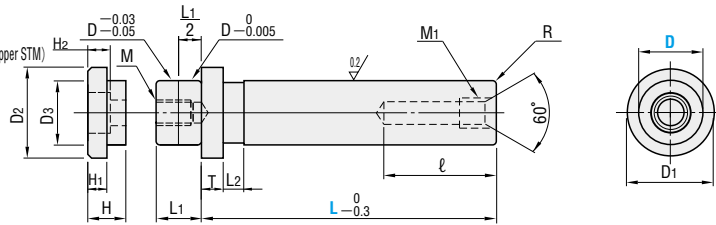
—Press-fit post type—



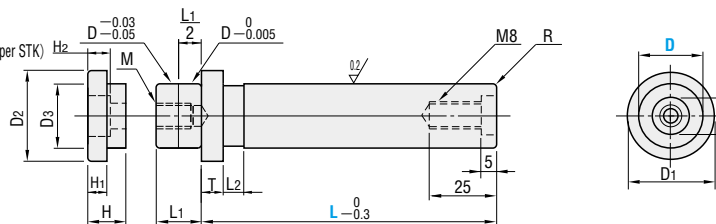
MRP



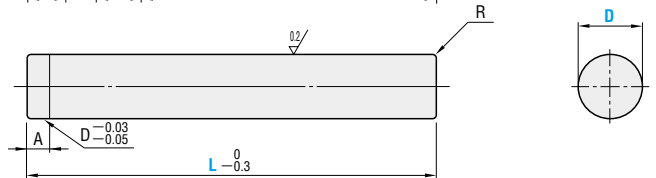
BRPM
(For movable stopper STM)



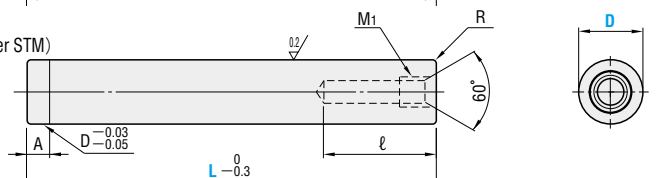
BRPK
(For fixed stopper STK)



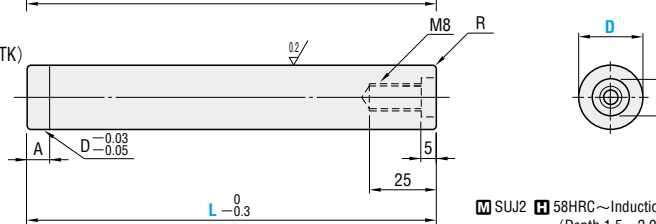
MSP



BSPM
(For movable stopper STM)



BSPK
(For fixed stopper STK)



M SUJ2 H 58HRC~Induction hardening
(Depth 1.5~2.0mm)

| D | D ₁ | T | L ₁ | L ₂ | ℓ | M ₁ ×P | d | A | M | R | D ₂ | D ₃ | H | H ₁ | H ₂ | △ Provided bolt |
|----|----------------|----|----------------|----------------|----|-------------------|----|---|--------|-----|----------------|----------------|----|----------------|----------------|-----------------|
| 20 | | 29 | 5 | 15 | 38 | M10×1.5 | 14 | 4 | M8×18 | 2.0 | 28 | 19.5 | 14 | 7 | 8.5 | CB 8—25 |
| 22 | +0.020 | 31 | 8 | 16 | 42 | M12×1.5 | 14 | 5 | M10×22 | 3.5 | 30 | 21.5 | 16 | 8 | 10.5 | CB10—30 |
| 25 | +0.015 | 36 | 18 | 50 | 35 | | | | | | 24.5 | | | | | |
| 28 | +0.025 | 39 | 20 | 60 | 40 | | | | | | 31.5 | | | | | |
| 32 | +0.020 | 44 | 10 | 23 | 60 | M16×1.5 | 20 | 6 | M12×27 | 4.0 | 49 | 37.5 | 18 | 10 | 12.5 | CB12—35 |
| 38 | +0.030 | 53 | 12 | 27 | 55 | | | | | | 44.5 | | | | | |
| 45 | +0.025 | 59 | 32 | 35 | 62 | | | | | | 49.5 | | | | | |
| 50 | +0.035 | 69 | 15 | 35 | 70 | M14×31 | 20 | 7 | M14×31 | 5.0 | 62 | 49.5 | 20 | 12 | 14.5 | CB14—40 |
| 60 | +0.030 | 79 | 42 | 70 | 72 | | | | | | 59.5 | | | | | |

| Catalog No. Type | D | L | | | | | | | | Base unit price 1~9 pieces | | | |
|---------------------|----|----|----|-----|-----|-----|-----|-----|-----|----------------------------|-----|-----------|--|
| | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | MRP | BRPM-BRPK | |
| MRP | 20 | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| BRPM | 28 | | | | | | | | | | | | |
| | 32 | | | | | | | | | | | | |
| BRPK | 38 | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | |
| | 60 | | | | | | | | | | | | |

| Catalog No. Type | D | L | | | | | | | | Base unit price 1~9 pieces | | | |
|---------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------|-----|-----------|--|
| | | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | MSP | BSPM-BSPK | |
| MSP | 20 | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| | 28 | | | | | | | | | | | | |
| | 32 | | | | | | | | | | | | |
| | 38 | | | | | | | | | | | | |
| BSPM | 45 | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | |
| | 55 | | | | | | | | | | | | |
| | 60 | | | | | | | | | | | | |



Catalog No. — L
BSPM 32 — 180



Days to Ship **Quotation**

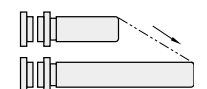


Price **Quotation**



Alterations Catalog No. — L(LC)
MRP 20 — LC77
Quotation

Long type guide posts with configurable full length are listed on P.929.



| Alteration | Code | Spec. | 1Code | | | | | | | | | |
|---------------|------|-----------------------------------|-------|----------------------|-----------|-----|-----------|----|----------|-----------|----------|----------|
| | | | D | MRP-MSP BSPM-BSPK | BRPM-BRPK | | | | | | | |
| MRP-BRPM-BRPK | LC | L dimension change 1mm increments | D | MRP | BRPM-BRPK | MSP | BSPM-BSPK | | | | | |
| | | | | | | | | 20 | 60 ~ 119 | 70 ~ 119 | 70 ~ 179 | 80 ~ 179 |
| MSP-BSPM-BSPK | LC | L dimension change 1mm increments | D | MRP | BRPM-BRPK | MSP | BSPM-BSPK | | | | | |
| | | | | | | | | 22 | 60 ~ 119 | 70 ~ 119 | 70 ~ 179 | 80 ~ 179 |
| | | | | | | | | 25 | 60 ~ 129 | 80 ~ 129 | 70 ~ 179 | 80 ~ 179 |
| | | | | | | | | 28 | 60 ~ 159 | 80 ~ 159 | 70 ~ 199 | 80 ~ 199 |
| | | | | | | | | 32 | 60 ~ 159 | 100 ~ 159 | 70 ~ 239 | 80 ~ 239 |
| | | | | | | | | 38 | 60 ~ 179 | 100 ~ 179 | 70 ~ 259 | 80 ~ 259 |
| | | | | | | | | 45 | 60 ~ 179 | 120 ~ 179 | 70 ~ 259 | 90 ~ 259 |
| | | | | | | | | 50 | 60 ~ 199 | 120 ~ 199 | 70 ~ 259 | 90 ~ 259 |
| | | | | | | | | 55 | 60 ~ 199 | 120 ~ 199 | 70 ~ 259 | 90 ~ 259 |
| | | | | | | | | 60 | 60 ~ 199 | 120 ~ 199 | 70 ~ 259 | 90 ~ 259 |

Quotation

GUIDE POSTS & BUSHINGS FOR DIE SETS

GUIDE POSTS FOR DIE SETS

—LONG TYPE, CONFIGURABLE FULL LENGTH—

RoHS

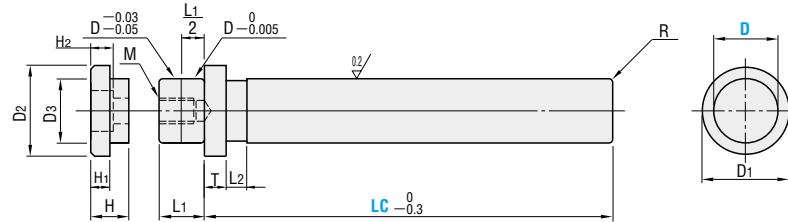
—Detachable post type—



—Press-fit post type—

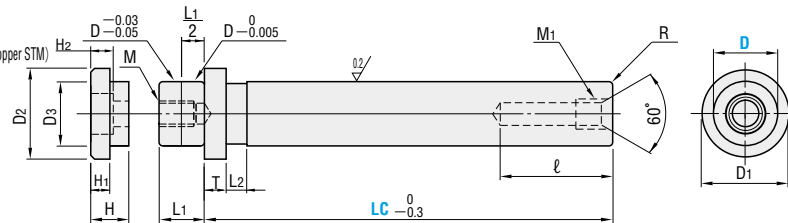


MRP



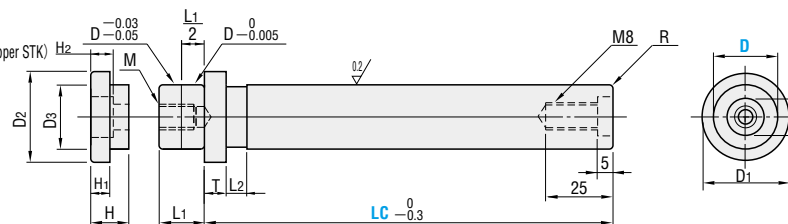
BRPM

(For movable stopper STM)

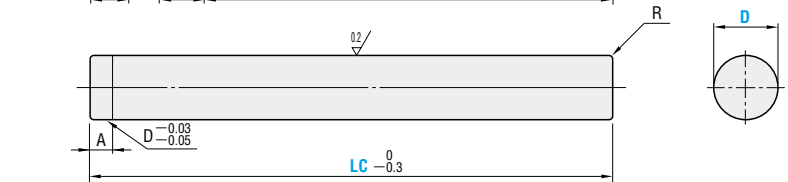


BRPK

(For fixed stopper STK)

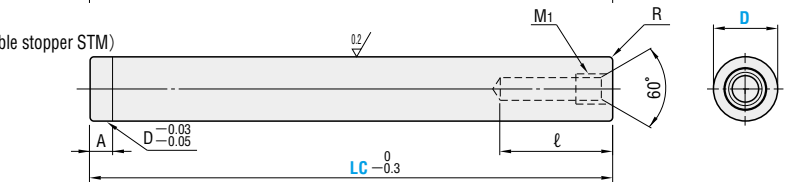


MSP



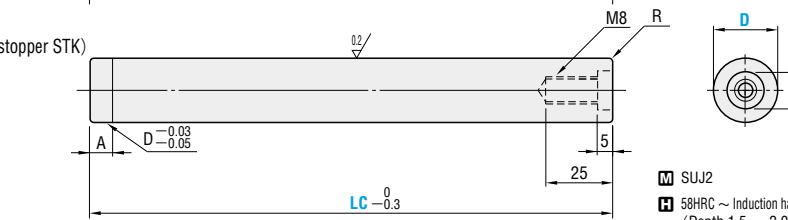
BSPM

(For movable stopper STM)



BSPK

(For fixed stopper STK)



■ SUJ2
■ 58HRC ~ Induction hardening (Depth 1.5 ~ 2.0mm)

| D | D ₁ | T | L ₁ | L ₂ | ℓ | M ₁ ×P | d | A | M | R | D ₂ | D ₃ | H | H ₁ | H ₂ | △ Provided bolt |
|----|----------------|----|----------------|----------------|----|-------------------|----|--------|--------|-----|----------------|----------------|----|----------------|----------------|-----------------|
| 20 | | 29 | 5 | 15 | 38 | M10×1.5 | 14 | 4 | M8×18 | 2.0 | 28 | 19.5 | 14 | 7 | 8.5 | CB 8—25 |
| 22 | +0.020 | 31 | 8 | 16 | 42 | | | | | | 30 | 21.5 | | | | |
| 25 | +0.015 | 36 | 18 | 10 | 50 | | | | | | 35 | 24.5 | | | | |
| 28 | +0.025 | 39 | 10 | 20 | 50 | M12×1.5 | 5 | M10×22 | 3.5 | 36 | 27.5 | 16 | 8 | 10.5 | CB10—30 | |
| 32 | +0.020 | 44 | | 23 | 60 | | | | | 40 | 31.5 | | | | | |
| 38 | +0.030 | 53 | 12 | 27 | 60 | M16×1.5 | 20 | 6 | M12×27 | 4.0 | 49 | 37.5 | 18 | 10 | 12.5 | CB12—35 |
| 45 | +0.025 | 59 | | 32 | 70 | | | | | | 55 | 44.5 | | | | |
| 50 | +0.035 | 69 | 15 | 35 | 70 | M14×31 | 7 | M14×31 | 5.0 | 62 | 49.5 | 20 | 12 | 14.5 | CB14—40 | |
| 60 | +0.030 | 79 | | 42 | 70 | | | | | 72 | 59.5 | | | | | |

Detachable post type

| Type | Catalog No. | D | 1mm increments LC | Base unit price 1 ~ 9 pieces | | |
|------|-------------|-----------|-------------------|------------------------------|-----------|--|
| | | | | MRP | BRPM BRPK | |
| MRP | 20 | | 121 ~ 160 | | | |
| | | | 161 ~ 200 | | | |
| | | | 201 ~ 250 | | | |
| | 22 | | 121 ~ 160 | | | |
| | | | 161 ~ 200 | | | |
| | | | 201 ~ 250 | | | |
| | 25 | | 131 ~ 160 | | | |
| | | | 161 ~ 200 | | | |
| | | | 201 ~ 240 | | | |
| | BRPM | 28 | | 161 ~ 200 | | |
| | | | | 201 ~ 240 | | |
| | | | | 241 ~ 300 | | |
| BRPK | 32 | | 161 ~ 200 | | | |
| | | | 201 ~ 240 | | | |
| | | | 241 ~ 350 | | | |
| 38 | | 181 ~ 200 | | | | |
| | | 201 ~ 240 | | | | |
| | | 241 ~ 260 | | | | |
| 45 | | 261 ~ 400 | | | | |
| | | 181 ~ 260 | | | | |
| | | 261 ~ 400 | | | | |
| 50 | | 201 ~ 260 | | | | |
| | | 261 ~ 400 | | | | |
| | | 201 ~ 260 | | | | |
| 60 | | 261 ~ 400 | | | | |
| | | 261 ~ 400 | | | | |
| | | 261 ~ 400 | | | | |

Quotation

Press-fit post type

| Type | Catalog No. | D | 1mm increments LC | Base unit price 1 ~ 9 pieces | | |
|------|-------------|-----------|-------------------|------------------------------|-----------|--|
| | | | | MSP | BSPM BSPK | |
| MSP | 20 | | 181 ~ 200 | | | |
| | | | 201 ~ 240 | | | |
| | | | 241 ~ 300 | | | |
| | 22 | | 181 ~ 200 | | | |
| | | | 201 ~ 240 | | | |
| | | | 241 ~ 300 | | | |
| | 25 | | 181 ~ 200 | | | |
| | | | 201 ~ 240 | | | |
| | | | 241 ~ 300 | | | |
| | BSPM | 28 | | 201 ~ 240 | | |
| | | | | 241 ~ 300 | | |
| | | | | 301 ~ 350 | | |
| BSPK | 32 | | 241 ~ 300 | | | |
| | | | 301 ~ 350 | | | |
| | | | 351 ~ 400 | | | |
| 38 | | 261 ~ 300 | | | | |
| | | 301 ~ 350 | | | | |
| | | 351 ~ 400 | | | | |
| 45 | | 401 ~ 450 | | | | |
| | | 261 ~ 300 | | | | |
| | | 301 ~ 400 | | | | |
| 50 | | 401 ~ 450 | | | | |
| | | 261 ~ 400 | | | | |
| | | 401 ~ 500 | | | | |
| 60 | | 261 ~ 400 | | | | |
| | | 401 ~ 500 | | | | |
| | | 261 ~ 400 | | | | |

Quotation



Order

Catalog No. — LC
BSPM 22 — LC205



Days to Ship

Quotation



Price


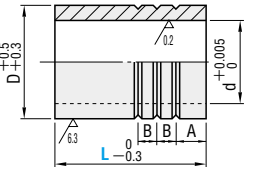
Quotation

BALL GUIDE BUSHINGS FOR DIE SETS


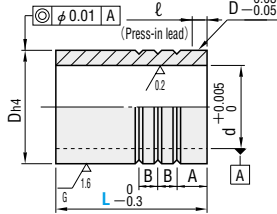
BALL GUIDE BUSHINGS FOR DIE SETS



—DETACHABLE TYPE—

RoHS **MBB** (Devcon adhesive type)

RoHS **LBB** (Loctite adhesive type)

 SUJ2
 58HRC~

| Catalog No. | | L | | Base unit price 1~9 pieces | |
|--------------------------------|----|-----|---------|----------------------------|-----|
| Type | PD | | | MBB | LBB |
| MBB (Devcon adhesive type) | 20 | 50 | | Quotation | |
| | 22 | 50 | 60 | | |
| | 25 | 60 | 80 | | |
| | 28 | 60 | 80 | | |
| 32 | 80 | 100 | | | |
| LBB (Loctite adhesive type) | 38 | 80 | 100 | | |
| | 45 | | 100 120 | | |
| | 50 | | 100 120 | | |
| | 60 | | 100 120 | | |

| PD | MBB·LBB | | | | | | |
|---------------|---------|-----------------|----|--------|---|----|----|
| Post diameter | d | D _{H4} | ℓ | A | B | | |
| 20 | +0.020 | 26 | 37 | 0 | 4 | 10 | 6 |
| 22 | +0.015 | 28 | 40 | -0.007 | | | |
| 25 | | 31 | 45 | | 5 | 12 | 7 |
| 28 | +0.025 | 36 | 50 | 0 | | | |
| 32 | +0.020 | 40 | 55 | -0.008 | | | |
| 38 | +0.030 | 48 | 64 | | 6 | 15 | 10 |
| 45 | +0.025 | 55 | 74 | | | | |
| 50 | +0.035 | 60 | 83 | 0 | | | |
| 60 | +0.030 | 70 | 95 | -0.010 | | | |

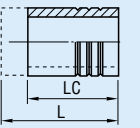
Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

Order **Catalog No.** — **L**
MBB 50 — 120

Alterations **Catalog No.** — **L(LC)**
LBB 22 — LC45


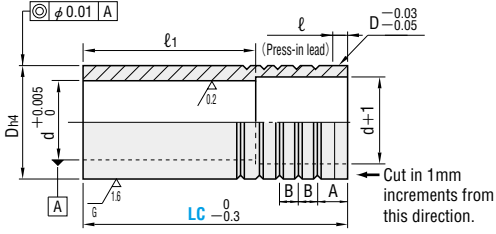
Days to Ship **Quotation**



Price **Quotation**

| Alteration | Code | Spec. | 1Code |
|---|------|--|-----------|
|  | LC | Full length change L/2 ≤ LC < L 1mm increments | Quotation |

Long type ball guide bushings for die sets

RoHS **LBB** (Loctite adhesive type)

 SUJ2
 58HRC~

Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

| d | D _{H4} | ℓ | A | B | Effective sliding length ℓ ₁ | Catalog No. | LC | Base unit price |
|------|-----------------|----------------|------------|----|---|-------------|-----------|-----------------|
| Type | PD | 1mm increments | 1~9 pieces | | | | | |
| 26 | 37 | 0 | 4 | 12 | 7×7 pieces | 20 | 51 ~ 120 | Quotation |
| 28 | 40 | -0.007 | | | | 22 | 61 ~ 120 | |
| 31 | 45 | | 5 | | 10×5 pieces | 25 | 81 ~ 120 | |
| 36 | 50 | | | | | 28 | 81 ~ 150 | |
| 40 | 55 | 0 | 6 | | 10×6 pieces | 32 | 101 ~ 150 | |
| 48 | 64 | -0.008 | | | | 38 | 101 ~ 180 | |
| 55 | 74 | | | | | 45 | 121 ~ 180 | |
| 60 | 83 | 0 | | | | 50 | 121 ~ 200 | |
| 60 | 83 | 0 | | | | 50 | 121 ~ 200 | |
| 70 | 95 | -0.010 | | | | 60 | 121 ~ 200 | |


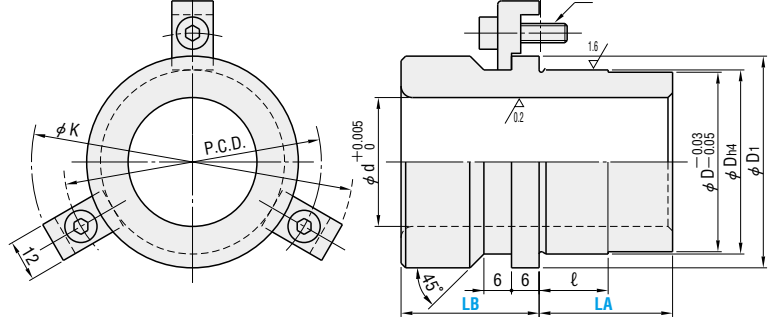
Order **Catalog No.** — **LC**
LBB 22 — LC100



Days to Ship **Quotation**


Price **Quotation**

If there is only one groove remaining as the result of cutting, a second groove is added.
LC51-59, in the case of PD20, effective slide length (ℓ₁) becomes short.

RoHS **RBB** (Detachable type)

 SUJ2
 58HRC~

 Clamp, CB6-20 (If PD ≤ 32, 3 pcs.; If PD = 38, 4 pcs.)

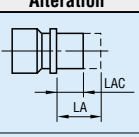
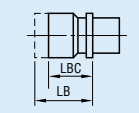
| PD | Post diameter | d | D _{H4} | D ₁ | ℓ | P.C.D. | K | M | Catalog No. | | Base unit price | |
|----|------------------|------------------|-----------------|----------------|--------|--------|----|-----|-------------|----|-----------------|-----------|
| | | | | | | | | | Type | PD | | LA |
| 6 | 20 | +0.020 +0.015 | 26 | 37 | 0 | 55 | 71 | RBB | 20 | 30 | 20 | Quotation |
| | | | | | | | | | | 35 | 25 | |
| | | | | | | | | | | 30 | 20 | |
| | 22 | +0.020 +0.015 | 28 | 40 | -0.007 | 58 | 74 | | | 35 | 25 | |
| | | | | | | | | | | 40 | 40 | |
| | | | | | | | | | | 35 | 25 | |
| | 25 | +0.020 +0.015 | 31 | 45 | 0 | 63 | 79 | | | 40 | 40 | |
| | | | | | | | | | | 35 | 25 | |
| | | | | | | | | | | 40 | 40 | |
| | 28 | +0.025 +0.020 | 36 | 50 | 0 | 68 | 84 | | | 35 | 25 | |
| | | | | | | | | | | 40 | 40 | |
| | | | | | | | | | | 40 | 40 | |
| 32 | +0.025 +0.020 | 40 | 55 | 0 | 73 | 89 | 40 | 40 | | | | |
| | | | | | | | 50 | 50 | | | | |
| | | | | | | | 40 | 40 | | | | |
| 38 | +0.030 +0.025 | 48 | 64 | -0.008 | 82 | 98 | 40 | 40 | | | | |
| | | | | | | | 50 | 50 | | | | |
| | | | | | | | 40 | 40 | | | | |

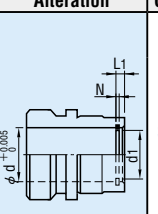
Order **Catalog No.** — **LA** — **LB**
RBB 25 — 40 — 40

Days to Ship **Quotation**

Price **Quotation**

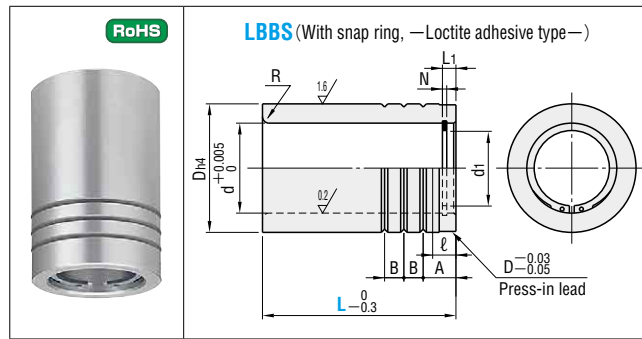
Alterations **Catalog No.** — **LA(LAC)** — **LB(LBC)** — **(SNC)**
RBB 20 — LAC32 — 25

| Alteration | Code | Spec. | 1Code |
|---|------|---|-----------|
|  | LAC | LA dimension change ℓ + 2 ≤ LAC < LA 1mm increments | Quotation |
|  | LBC | LB dimension change 6 ≤ LBC < LB 1mm increments | |

| Alteration | Code | Spec. | 1Code | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------|--|----------------|----|----------------|---|----------------|----|--|------|------|----|---|------|----|----|--|------|----|----|--|------|----|----|-----|-----|------|----|--|-----|
|  | SNC | Installation of a snap ring onto the lower die bushing. | Quotation | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>PD</th> <th>L₁</th> <th>N</th> <th>d₁</th> </tr> </thead> <tbody> <tr> <td>20</td> <td></td> <td>1.35</td> <td>21.4</td> </tr> <tr> <td>22</td> <td>4</td> <td>1.35</td> <td>23</td> </tr> <tr> <td>25</td> <td></td> <td>1.65</td> <td>26</td> </tr> <tr> <td>28</td> <td></td> <td>1.65</td> <td>30</td> </tr> <tr> <td>32</td> <td>4.5</td> <td>1.9</td> <td>33.2</td> </tr> <tr> <td>38</td> <td></td> <td>1.9</td> <td>40</td> </tr> </tbody> </table> For applications, see P.849. | | PD | L ₁ | N | d ₁ | 20 | | 1.35 | 21.4 | 22 | 4 | 1.35 | 23 | 25 | | 1.65 | 26 | 28 | | 1.65 | 30 | 32 | 4.5 | 1.9 | 33.2 | 38 | | 1.9 |
| PD | L ₁ | N | d ₁ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | 1.35 | 21.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 4 | 1.35 | 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | 1.65 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | | 1.65 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | 4.5 | 1.9 | 33.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | | 1.9 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

BALL GUIDE BUSHINGS FOR LOWER DIE SETS

BALL CAGES FOR DIE SETS



Order Catalog No. — L
LBBS 50 — 120

Days to Ship Quotation

Price Quotation

M SUJ2 58HRC~
A Snap ring (Spring steel 44~52HRC)

| PD Post diameter | d | D _{h4} | ℓ | A | B | L ₁ | N | R | d ₁ | Catalog No. Type | PD | L | Base unit price 1~9 pieces |
|------------------|--------|-----------------|----|---|----|----------------|-----|------|----------------|------------------|----|---------|----------------------------|
| 20 | +0.020 | 26 | 37 | 4 | 10 | 6 | 4 | 1.35 | 2.5 | LBBS | 20 | 50 | Quotation |
| 22 | +0.015 | 28 | 40 | | | | | | | | 22 | 50 60 | |
| 25 | | 31 | 45 | | | | | | | | 25 | 60 80 | |
| 28 | +0.025 | 36 | 50 | 5 | 12 | 7 | 4.5 | 1.65 | 3 | LBBS | 28 | 60 80 | Quotation |
| 32 | +0.020 | 40 | 55 | | | | | | | | 32 | 80 100 | |
| 38 | +0.030 | 48 | 64 | | | | | | | | 38 | 80 100 | |
| 45 | +0.025 | 55 | 74 | 6 | 15 | 10 | 5 | 2.2 | 3.5 | LBBS | 45 | 100 120 | Quotation |
| 50 | +0.035 | 60 | 83 | | | | | | | | 50 | 100 120 | |
| 60 | +0.030 | 70 | 95 | | | | | | | | 60 | 100 120 | |

- Features of ball guide bushings for lower die sets**
- Stable guide ... The distance between punch and die blades and the guide (post and bushing) can be shortened. (A<B)
 - Easy regrinding of punch & die ... Due to the short distance between the punch/die blade and guide post end, it is possible to perform regrinding without detaching the guide post.

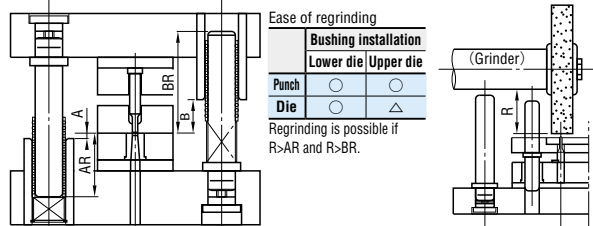


Figure 1: Lower die bushing and normal bushing

Figure 2: Regrinding of punch

Alterations Catalog No. — L(LC)
LBBS 22 — LC45

| Alteration | Code | Spec. | 1Code |
|------------|------|--|-----------|
| | LC | Full length change L/2 ≤ LC < L 1mm increments | Quotation |

Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

SWPB (Special spring for LBBS)

FL (Free length)

Note: SWPB is a spring specially designed for LBBS (bushing reference). For post-reference springs (SWP, SWPL), refer to P.935.

Order Catalog No. — FL
SWPB 25 — 50

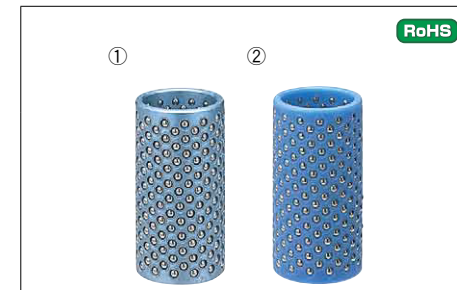
Days to Ship Quotation

Price Quotation

| D | D ₁ | d | P | Catalog No. Type | PD | FL 5mm increments | Base unit price 1~9 pieces |
|----|----------------|-----|----|------------------|----|-------------------|----------------------------|
| 25 | 23.2 | 0.9 | 12 | SWPB | 20 | 25 ~ 40 | Quotation |
| 27 | 25.0 | 1.0 | 13 | | 22 | 25 ~ 50 | |
| 30 | 27.8 | 1.1 | 15 | | 25 | 25 ~ 60 | |
| 35 | 32.6 | 1.2 | 18 | | 28 | 25 ~ 60 | |
| 39 | 36.0 | 1.5 | 20 | | 32 | 35 ~ 70 | |
| 47 | 43.4 | 1.8 | 25 | | 38 | 35 ~ 70 | |
| 54 | 50.0 | 2.0 | 30 | | 45 | 45 ~ 80 | |
| 59 | 54.4 | 2.3 | 35 | | 50 | 45 ~ 80 | |
| 69 | 63.8 | 2.6 | 40 | | 60 | 45 ~ 80 | |

Spring solid height

| PD | FL (Free length) | | | | | | | | | | | | | | | |
|----|------------------|-----|-----|-----|------|------|------|------|------|------|------|------|--|--|--|--|
| | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | | | | |
| 20 | 3.7 | 4.0 | 4.4 | 4.8 | — | — | — | — | — | — | — | — | | | | |
| 22 | 4.1 | 4.5 | 4.9 | 5.3 | 5.7 | 6.2 | — | — | — | — | — | — | | | | |
| 25 | 4.3 | 4.7 | 5.2 | 5.6 | 5.9 | 6.4 | 6.8 | 7.3 | — | — | — | — | | | | |
| 28 | 4.4 | 4.8 | 5.2 | 5.6 | 6.0 | 6.4 | 6.8 | 7.2 | — | — | — | — | | | | |
| 32 | — | — | 6.4 | 7.0 | 7.5 | 8.0 | 8.5 | 9.5 | 9.4 | 10.0 | — | — | | | | |
| 38 | — | — | 7.0 | 7.6 | 8.0 | 8.6 | 9.0 | 9.5 | 10.0 | 10.6 | — | — | | | | |
| 45 | — | — | — | — | 8.6 | 9.0 | 9.6 | 10.0 | 10.6 | 11.0 | 11.6 | 12.0 | | | | |
| 50 | — | — | — | — | 9.9 | 10.4 | 11.0 | 11.5 | 12.2 | 12.6 | 13.3 | 13.8 | | | | |
| 60 | — | — | — | — | 11.2 | 11.7 | 12.5 | 13.0 | 13.8 | 14.3 | 15.1 | 15.6 | | | | |



Order Catalog No. — L
MBJ 50 — 110

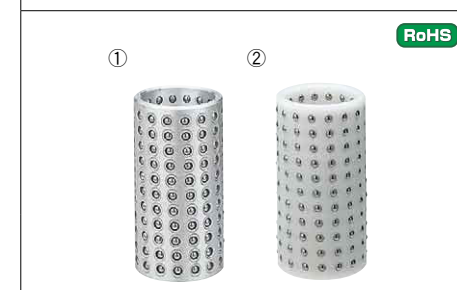
Days to Ship Quotation

Price Quotation

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

Compared with conventional ball cages (MBS, MBJ), these products contain 1.6 times more balls.

① A5056 (Aluminum)
② POM (Polyacetal resin)
③ SUJ2 Sphericity 0.25 μm
④ ③62~67HRC



Order Catalog No. — L(LC)
MBJH 22 — LC45

Days to Ship Quotation

Price Quotation

MBS (① Aluminum ball cage)
MBJ (② Resin ball cage)

For holder guide posts P.959

① A5056 (Aluminum)
② POM (Polyacetal resin)
③ SUJ2 Sphericity 0.25 μm
④ ③62~67HRC

| PD Post diameter | Outer diameter φ D | Inner diameter φ D ₁ | Ball diameter φ d | Number of balls | | | Catalog No. Type | PD | L | Base unit price 1~9 pieces | | | |
|------------------|--------------------|---------------------------------|-------------------|-----------------|---------|-------------|------------------|----------------|-----|----------------------------|------|-----|-----|
| | | | | MBSH MBJH | MBS MBJ | Ratio | | | | MBSH | MBJH | MBS | MBJ |
| 20 | 25.5 | 20.5 | 3 | 165 | 96 | 1.72 | MBSH (Aluminum) | 20 | 50 | | | | |
| 22 | 27.5 | 22.5 | | 180 | 112 | 1.61 | | 22 | 50 | | | | |
| | | | | 228 | 140 | 1.63 | | 25 | 60 | | | | |
| 25 | 30.5 | 25.5 | 4 | 266 | 160 | 1.66 | MBJH (Resin) | 25 | 60 | | | | |
| | | | | 350 | 208 | 1.68 | | 28 | 75 | | | | |
| 28 | 35.5 | 28.5 | | 204 | 126 | 1.62 | | MBS (Aluminum) | 28 | 60 | | | |
| 32 | 39.5 | 32.5 | 252 | 154 | 1.64 | MBJ (Resin) | 28 | | 75 | | | | |
| | | | 294 | 176 | 1.67 | | 32 | 75 | | | | | |
| 38 | 47.5 | 38.5 | 5 | 350 | 208 | 1.68 | MBS (Aluminum) | 32 | 90 | | | | |
| | | | | 238 | 144 | 1.65 | | 38 | 75 | | | | |
| 45 | 54.5 | 45.5 | | 280 | 176 | 1.67 | | MBJ (Resin) | 38 | 90 | | | |
| 50 | 59.5 | 50.5 | 320 | 198 | 1.70 | MBJ (Resin) | 45 | | 90 | | | | |
| | | | 400 | 234 | 1.71 | | 50 | 110 | | | | | |
| 60 | 69.5 | 60.5 | 360 | 220 | 1.72 | MBJ (Resin) | 50 | 90 | | | | | |
| | | | 450 | 260 | 1.73 | | 60 | 110 | | | | | |
| | | | | 400 | 242 | 1.74 | | 60 | 90 | | | | |
| | | | | 500 | 286 | 1.75 | | 60 | 110 | | | | |

Order Catalog No. — L
MBJ 50 — 110

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L(LC)
MBJH 22 — LC45

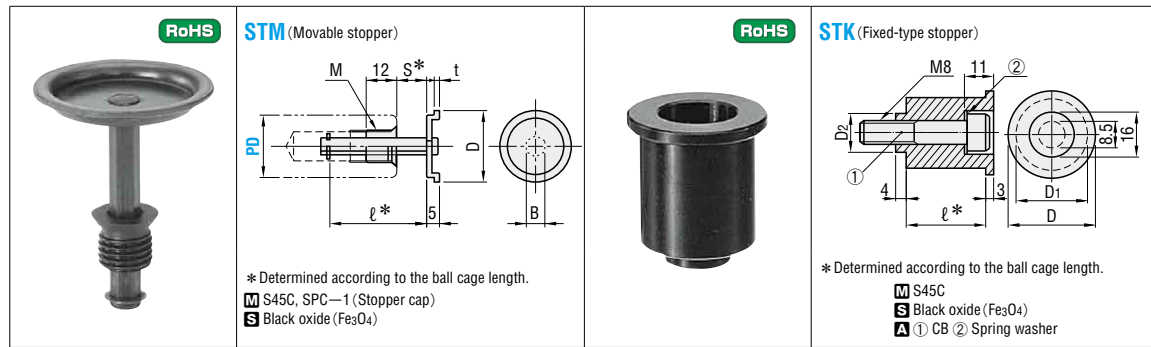
Quotation

| Alteration | Code | Spec. | 1Code |
|------------|------|--|-----------|
| | LC | Full length change 20 ≤ LC < L 1mm increments Ball holes may remain on the cut surface. | Quotation |

MBSH and MBJH are also listed in P.942. (For stripper guides: PD10~25)

STOPPERS AND SPRINGS FOR BALL GUIDES

RINGS FOR PREVENTING CAGE LIFTING



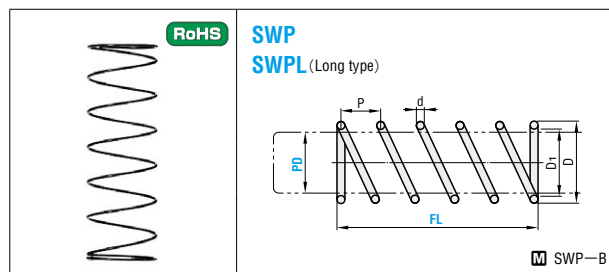
| PD Post diameter | D | M×P | B | t | D ₁ | D ₂ | ② A Spring washer | Catalog No. Type | L Ball cage length | | Base unit price 1~9 pieces | |
|---------------------|----|--------|---|-----|----------------|----------------|--|--------------------------|-----------------------|----|-------------------------------|-----|
| | | | | | | | | | PD | PD | | |
| 20 | 24 | 10×1.5 | 5 | 1.6 | 19 | 14 | Nominal diameter according to JIS B1251-1984 is 8mm. | STM (Movable stopper) | 20 | 50 | Quotation | |
| 22 | 26 | | | | 21 | | | | 22 | 50 | | 60 |
| 25 | 29 | | | | 24 | | | | 25 | 60 | | 75 |
| 28 | 33 | 12×1.5 | 6 | 27 | 28 | 60 | | 75 | | | | |
| 32 | 37 | | | 31 | 32 | 75 | | 90 | | | | |
| 38 | 44 | | | 37 | 38 | 75 | | 90 | | | | |
| 45 | 51 | 16×1.5 | 8 | 2.0 | 44 | 20 | | STK (Fixed stopper) | 45 | 90 | | 110 |
| 50 | 56 | | | | 49 | | | | 50 | 90 | | 110 |
| 60 | 66 | | | | 59 | | | | 60 | 90 | | 110 |

| L Ball cage length | STM | | STK | |
|-----------------------|------|----|-----|------|
| | S | ℓ | ℓ | ①CB |
| 50 | 0~19 | 31 | 15 | 8-30 |
| 60 | 0~23 | 35 | 20 | 8-35 |
| 75 | 0~30 | 42 | 25 | 8-40 |
| 90 | 0~37 | 49 | 30 | 8-45 |
| 110 | 0~47 | 59 | 35 | 8-50 |

Order **STM** Catalog No. **STM 32** - L **90**

Days to Ship **Quotation**

Price **Quotation**



| PD Post diameter | D | D ₁ ⁺¹ ₀ | d | P |
|---------------------|------|---|-----|----|
| 20 | 22.5 | 20.5 | 1.0 | 14 |
| 22 | 24.5 | 22.5 | 1.0 | 14 |
| 25 | 27.9 | 25.5 | 1.2 | 14 |
| 28 | 31.3 | 28.5 | 1.4 | 16 |
| 32 | 35.7 | 32.5 | 1.6 | 16 |
| 38 | 42.5 | 38.5 | 2.0 | 18 |
| 45 | 50.1 | 45.5 | 2.3 | 20 |
| 50 | 55.7 | 50.5 | 2.6 | 20 |
| 60 | 66.9 | 60.5 | 3.2 | 20 |

● Solid height = $\frac{FL \times d}{P} + 2d$

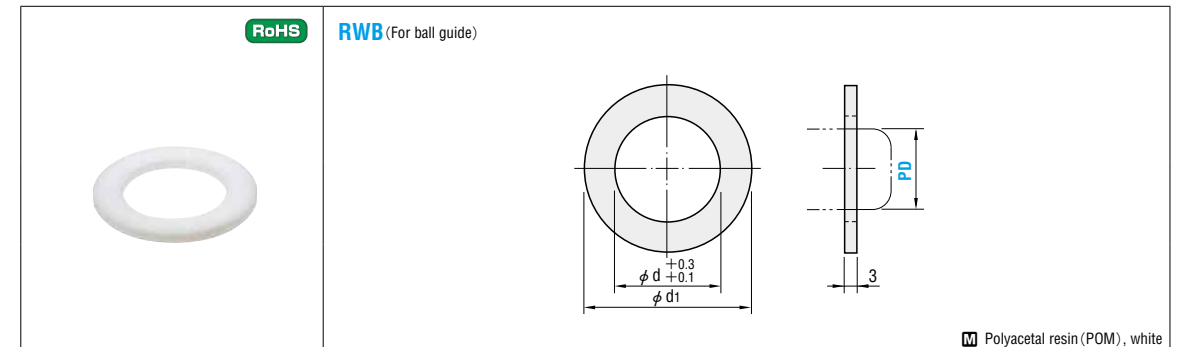
Order **SWP** Catalog No. **SWP 32** - FL **100**

Days to Ship **Quotation**

| Catalog No. Type | PD | FL 10mm increments | | Base unit price 1~9 pieces |
|---------------------|-----|-----------------------|-------|-------------------------------|
| | | FL | FL | |
| SWP | 20 | 40 | ~ 90 | Quotation |
| | | 100 | ~ 140 | |
| | 22 | 40 | ~ 90 | |
| | | 100 | ~ 140 | |
| | 25 | 40 | ~ 90 | |
| | | 100 | ~ 140 | |
| | 28 | 50 | ~ 90 | |
| | | 100 | ~ 150 | |
| | 32 | 70 | ~ 140 | |
| | | 150 | ~ 190 | |
| 38 | 80 | ~ 140 | | |
| | 150 | ~ 190 | | |
| 45 | 80 | ~ 140 | | |
| | 150 | ~ 190 | | |
| 50 | 80 | ~ 140 | | |
| | 150 | ~ 190 | | |
| 60 | 80 | ~ 140 | | |
| | 150 | ~ 190 | | |

| Catalog No. Type | PD | FL 10mm increments | | Base unit price 1~9 pieces |
|---------------------|-----|-----------------------|-------|-------------------------------|
| | | FL | FL | |
| SWPL (Long type) | 20 | 150 | ~ 190 | Quotation |
| | | 200 | ~ 240 | |
| | 22 | 150 | ~ 190 | |
| | | 200 | ~ 240 | |
| | 25 | 160 | ~ 200 | |
| | | 210 | ~ 260 | |
| | 28 | 160 | ~ 200 | |
| | | 210 | ~ 260 | |
| | 32 | 200 | ~ 220 | |
| | | 230 | ~ 260 | |
| 38 | 200 | ~ 240 | | |
| | 250 | ~ 300 | | |
| 45 | 200 | ~ 240 | | |
| | 250 | ~ 300 | | |
| 50 | 200 | ~ 240 | | |
| | 250 | ~ 300 | | |
| 60 | 200 | ~ 240 | | |
| | 250 | ~ 300 | | |

Price **Quotation**



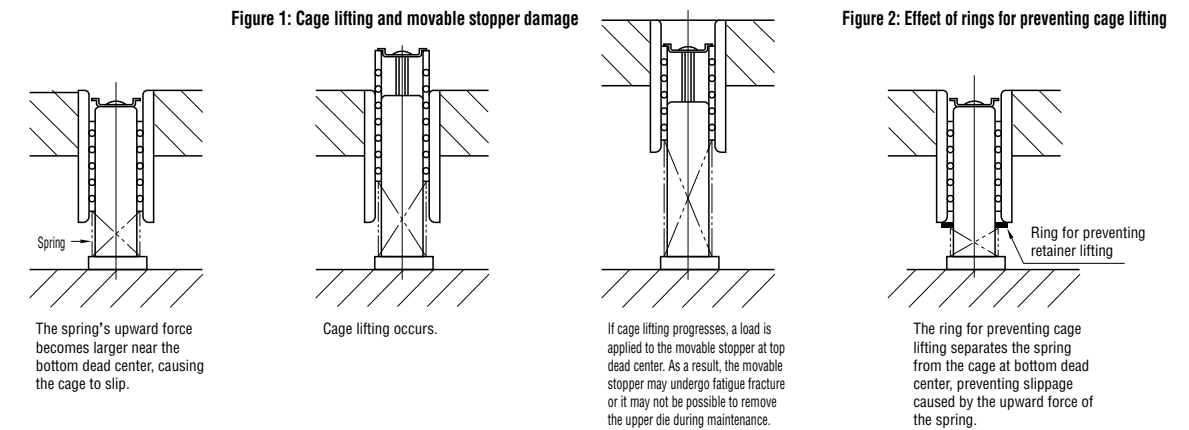
| Inner diameter d | Outer diameter d1 | Catalog No. Type | PD | Base unit price 1~9 pieces | |
|---------------------|----------------------|---------------------|----|-------------------------------|----|
| | | | | | 20 |
| 22 | 35 | +0.3 | 20 | | |
| 25 | 40 | +2.0 | 22 | | |
| 28 | 45 | +0.5 | 25 | | |
| 32 | 50 | +0.5 | 28 | | |
| 38 | 60 | +3.0 | 32 | | |
| 45 | 70 | +1.0 | 38 | | |
| 50 | 75 | +1.0 | 45 | | |
| 60 | 85 | +4.0 | 50 | | |
| | | | 60 | | |

Order **RWB 25**


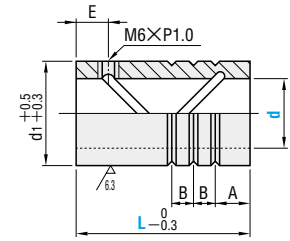

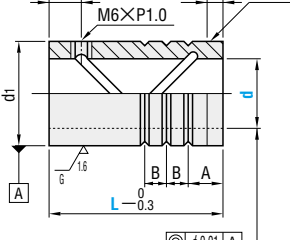

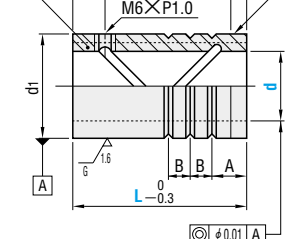

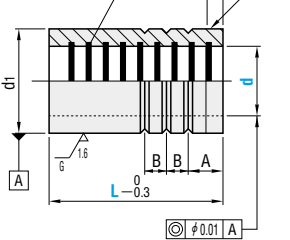

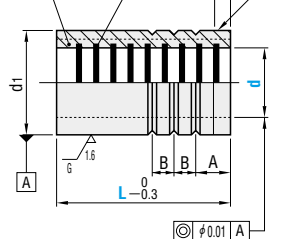
Days to Ship **Quotation**

Price **Quotation**

■ Features Prevents lifting of the cage caused by the upward force of the spring, extending the lifetimes of guide post and bushing.



PLAIN GUIDE BUSHINGS FOR DIE SETS

| | |
|--|---|
|  <p>RoHS</p> | <p>MDB (Devcon adhesive type)</p>  |
|  <p>RoHS</p> | <p>LDB (Loctite adhesive type)</p>  |
|  <p>RoHS</p> | <p>LFB (Copper alloy type)</p> <p>Copper alloy</p>  |
|  <p>RoHS</p> | <p>LDBZ (Oil-free type)</p> <p>MoS₂ (Press-in lead)</p>  |
|  <p>RoHS</p> | <p>LFBZ (Copper alloy oil-free type)</p> <p>Copper alloy MoS₂ (Press-in lead)</p>  |

| Catalog No. | Type | d | L | | Base unit price |
|-------------|------|----|-----|-----|-----------------|
| | | | | | 1~9 pieces |
| MDB | | 20 | 50 | | Quotation |
| | | 22 | 50 | 60 | |
| | | 25 | 60 | 80 | |
| | | 28 | 60 | 80 | |
| | | 32 | 80 | 100 | |
| | | 38 | 80 | 100 | |
| | | 45 | 100 | 120 | |
| | | 60 | 100 | 120 | |

M SUJ2 A Grease nipple GPA6A
H 58HRC~

| Catalog No. | Type | d | L | | Base unit price |
|-------------|------|----|-----|-----|-----------------|
| | | | | | 1~9 pieces |
| LDB | | 20 | 50 | | Quotation |
| | | 22 | 50 | 60 | |
| | | 25 | 60 | 80 | |
| | | 28 | 60 | 80 | |
| | | 32 | 80 | 100 | |
| | | 38 | 80 | 100 | |
| | | 45 | 100 | 120 | |
| | | 60 | 100 | 120 | |

M SUJ2 A Grease nipple GPA6A
H 58HRC~

| Catalog No. | Type | d | L | | Base unit price |
|-------------|------|----|----|-----|-----------------|
| | | | | | 1~9 pieces |
| LFB | | 20 | 50 | | Quotation |
| | | 22 | 50 | 60 | |
| | | 25 | 60 | 80 | |
| | | 28 | 60 | 80 | |
| | | 32 | 80 | 100 | |
| | | 32 | 80 | 100 | |

M SUJ2+Copper alloy A Grease nipple GPA6A
H 45HRC~ (SUJ2 part)

| Catalog No. | Type | d | L | | Base unit price |
|-------------|------|----|-----|-----|-----------------|
| | | | | | 1~9 pieces |
| LDBZ | | 20 | 50 | | Quotation |
| | | 22 | 50 | 60 | |
| | | 25 | 60 | 80 | |
| | | 28 | 60 | 80 | |
| | | 32 | 80 | 100 | |
| | | 38 | 80 | 100 | |
| | | 45 | 100 | 120 | |
| | | 50 | 100 | 120 | |

M SUJ2 MoS₂ (embedded)
H 58HRC~

| Catalog No. | Type | d | L | | Base unit price |
|-------------|------|----|----|-----|-----------------|
| | | | | | 1~9 pieces |
| LFBZ | | 20 | 50 | | Quotation |
| | | 22 | 50 | 60 | |
| | | 25 | 60 | 80 | |
| | | 28 | 60 | 80 | |
| | | 32 | 80 | 100 | |

M SUJ2+Copper alloy MoS₂ (embedded)
H 45HRC~ (SUJ2 part)

| d | d ₁ | d ₁ tolerance | | ℓ | A | B | E |
|----|----------------|--------------------------------------|-------------------|------------------|-------------|----|----|
| | | MDB | LDB·LFB·LDBZ·LFBZ | | | | |
| 20 | 31 | | | 4 | 10 | 6 | 10 |
| 22 | 34 | +0.027 +0.022 | 0 -0.007 | | | | |
| 25 | 37 | | | | | | |
| 28 | 42 | | | +0.032 +0.027 | 0 -0.008 | 5 | 12 |
| 32 | 46 | | | | | | |
| 38 | 54 | | | | | | |
| 45 | 62 | +0.037 +0.032 +0.040 +0.035 | 0 -0.008 | 6 | 15 | 10 | 15 |
| 50 | 70 | | | | | | |
| 60 | 80 | | | | | | |

■ Bushing bonding method (Adhesives P.940)

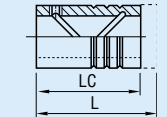
| Catalog No. | Adhesive |
|-------------|-------------------------|
| MDB | — |
| LDB | Loctite No.638 (LOC638) |
| LDBZ | |
| LFB | |
| LFBZ | |

Order **Catalog No.** — **L**
LFBZ 28 — 80

Days to Ship **Quotation**

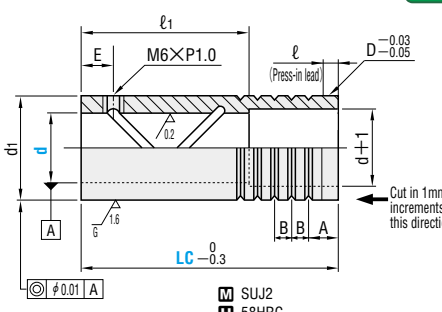
Price **Quotation**

Alterations **Catalog No.** — **L(LC)**
LDB 22 — LC45

| Alteration | Code | Spec. | LC |
|--|------|---|-----------------------------|
|  | LC | Full length change Can be used for MDB and LDB only. L/2 ≤ LC < L 1mm increments If cut, the oil groove may be cut. | d20~32 d38~ Quotation |

■ Long type guide bushings with configurable full length

LDB (Loctite adhesive type) **RoHS**



M SUJ2
H 58HRC~
A Grease nipple GPA6A

| d | d ₁ | ℓ | A | B | E | Effective sliding length ℓ ₁ | Catalog No. | | Base unit price | |
|----|----------------|----|-------------|------------|----|---|-------------|----|-----------------|-----------|
| | | | | | | | Type | LC | | |
| 20 | 31 | 4 | 12 | 7×7 pieces | 10 | 60 | LDB | 20 | 51~120 | Quotation |
| 22 | 34 | | | | | | | 22 | 61~120 | |
| 25 | 37 | | | | | | | 25 | 81~120 | |
| 28 | 42 | 5 | 10×5 pieces | 80 | 28 | 81~150 | | | | |
| 32 | 46 | | | | 32 | 101~150 | | | | |
| 38 | 54 | 6 | 10×6 pieces | 100 | 38 | 101~180 | | | | |
| 45 | 62 | | | | 45 | 121~180 | | | | |
| 50 | 70 | | | | 50 | 121~200 | | | | |
| 60 | 80 | 60 | 10×8 pieces | 120 | 60 | 121~200 | | | | |

⚠ If there is only one groove remaining as the result of cutting, groove(s) are added so that a minimum of two grooves are present.
⚠ LC51~59, in the case of d20, effective slide length (ℓ₁) becomes short.

Order **Catalog No.** — **LC**
LDB 22 — LC100

Days to Ship **Quotation**

Price **Quotation**

⚠ Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

SHANKS FOR DIE SETS

MILLION GREASE/DIE ADHESIVE

—POLYUREA EP GREASE / LOCTITE No.638—

RoHS

MSK **MSKS (With hexagon hole)** **MSKTP (With hexagon hole and taper)**

S45C

| B | C | L | ML | M | MSKTP | | Catalog No. | | | | | |
|----|---|----|----|----------|-------|----|----------------------|-------|-----------|------|-------|--|
| | | | | | L1 | L2 | Type | D—M | MSK | MSKS | MSKTP | |
| 12 | 2 | 50 | 40 | M18×P1.5 | 10 | 28 | MSK MSKS MSKTP | 25—18 | Quotation | | | |
| | | 55 | | M22×P1.5 | 12 | 30 | | 25 | | | | |
| 17 | 3 | 60 | 60 | M30×P2 | 13 | 32 | | 32 | | | | |
| | | 65 | | | 15 | 32 | | 38 | | 50 | | |

Order **Catalog No.**
MSK 50

Days to Ship **Quotation**

Price **Quotation**

Alterations **Catalog No.** — (MLC)
MSKTP 38 — MLC40
Quotation

| Alteration | Code | Spec. | 1Code |
|------------|------|---|-----------|
| | MLC | ML dimension change M ≤ MLC < ML 1mm increments | Quotation |

MILLION GREASE (Polyurea EP grease) **RoHS**

MGS—80 (80g)
MGS—400 (400g)

| Material name | Composition ratio |
|-------------------------------|-------------------|
| Base oil: refined mineral oil | Approx. 75% |
| Thickener: polyurea | Approx. 10% |
| Additive | Approx. 15% |

Application

- For lubrication of guide units of punch die and forming die.
- For lubrication of mechanical sliding part.

Features

- It is a polyurea EP grease composed of molybdenum, EP additive, polymer, antioxidant and antirust agent, which uses polyurea EP thickener and refined mineral oil having good thermal stability as its base oil.
- It has superior oxidation stability, water-proof performance, adhesiveness, heat resistance, mechanical stability, and particularly excellent extreme pressure (EP) property due to specially added molybdenum.
- Because special polymer is added, it is highly adhesive, waterproof and retentive so that it can be applied to where grease dips easily (such as vertical sliding surface).

Precautions for use

- Inflammation may occur if it enters eyes, be sure to wear goggles when it is used.
- Skin contact may cause inflammation, be sure to wear protective gloves when it is used.
- Be sure to wear protective gloves in order to prevent hands from being hurt by container falling-down.

Be sure to read above-mentioned precautions before use.

Die adhesive **RoHS**

LOC638—250 **LOC638—50**
—Loctite No.638— —Loctite No.638—
250ml 50ml

Order **Catalog No.** — **Amount**
LOC 638 — 50

Days to Ship **Quotation**

Price **Quotation**

| Volume (g) | Exterior | Service temperature range | Consistency (25°C) | Catalog No. | ¥ Base unit price | ¥ Volume discount unit price |
|------------|----------------|---------------------------|--------------------|-------------|-------------------|------------------------------|
| | | | | | 1piece | 2piece ~ |
| 80 | Yellow threads | -20 ~ 150°C | 320 | MGS—80 | Quotation | |
| 400 | | | | MGS—400 | | |

Order **Catalog No.**
MGS—80

Days to Ship **Quotation**

Price **Quotation**

| Fluid color | Main ingredient | Viscosity (cP) | Service temperature range (°C) | Catalog No. | Volume (mL) | Base unit price 1~4 pieces |
|-------------|-----------------|----------------|--------------------------------|-------------|-------------|----------------------------|
| Green | Anaerobic resin | 2500 | -55~125 | LOC638 | 250 50 | Quotation |

Applications (LOC638)

- Can be used for bonding knock bushings (KNLB, KNLBB), die set bushings (LBB, LDB) and stripper guide bushings (SGBL, SGBZ, SGHZ, SGBF, SGFZ).

| Strength | Recommended clearance at one side (mm) | Hardening time (hours at room temp.) | | Hardening method |
|---|--|--------------------------------------|---------------|------------------|
| | | Active surface | Inert surface | |
| Shear strength 25~35 (N/mm ²) | 0.01~0.03 ^{Note (1)} | 1~3 | 3~6 | Room temperature |

- (1) Generally, when a die part is press-fit, it is bonded with a clearance of 0.01~0.03mm on one side.
 (2) This is the time required until a serviceable strength (50% hardening) is reached.
 Active surfaces are steel, copper alloys, aluminum alloys, and similar surfaces. Inert surfaces are stainless steel, zinc, heat-curing resins, plated surfaces, and similar surfaces.
 (3) Service temperature range : -55~125°C
 ⚠ Degreasing is recommended before application of Loctite adhesives.