

Rolled Ball Screws / Precision Ball Screws

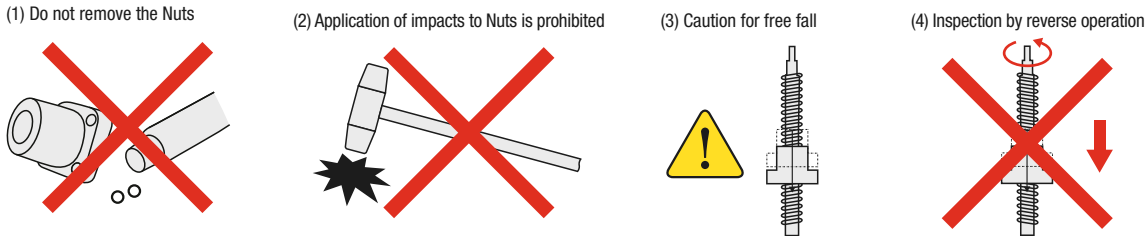
Precautions on Handling

Lubrication, Grease Measures, Cautions on Designing and Assembling Peripherals

■ Precautions on handling Ball Screws

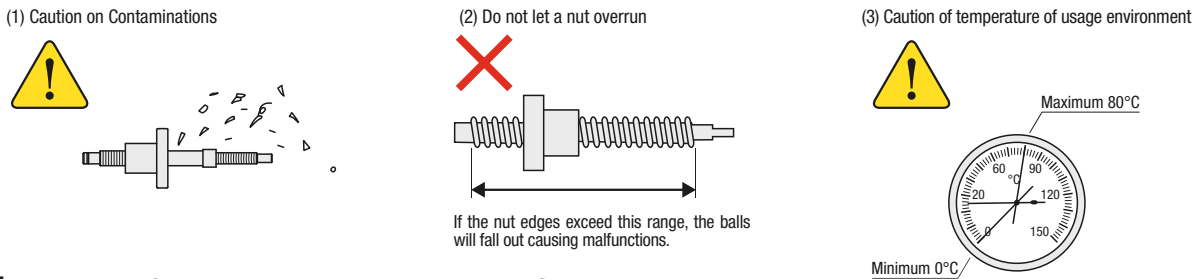
• Precautions on Handling

- (1) Removing the ball nut from the screw shaft causes the ball to fall out rendering the ball screw unusable. Do not disassemble Ball Screws. It may attract dusts and degrade assembly accuracy. Use dedicated temporary shafts when removing Ball Nuts.
- (2) Do not give an external impact to a screw shaft outer diameter, thread and recirculation parts. It may cause recirculation failure and a malfunction.
- (3) Do not tilt the ball screw assembly since a ball screw nut may spin off from a screw shaft due to its own weight. Especially when using a ball screw vertically, place a fall-off prevention mechanism since a ball screw nut may spin off due to its own weight.
- (4) When inspecting the sliding, fix the nut and cause the shaft to rotate, or fix the shaft and cause the nut to rotate.



• Cautions on use

- (1) Use Ball Screws in clean environments. Use covers, etc. to prevent intrusion of dusts and chips that may cause damages and performance degradations to ball recirculation components.
- (2) Do not let a ball screw nut overrun. It may cause the balls to fall out or damage the ball recirculation parts.
- (3) Avoid using Ball Screws at a temperature of more than 0~80°C. It may damage recirculation parts or seal parts.
- (4) Do not misalign or tilt ball screws shaft support side and a ball screw nut. Life hours may become extremely short due to an offset load to a ball screw nut. When using Support Units, refer to **P.760**.



■ Rolled Ball Screws · About Removing Ball Screws

If the nut is removed from the shaft, the balls contained in the nut will fall out and the ball screw will become unusable. Use dedicated temporary shafts when removing Ball Nuts. MISUMI provides various temporary shafts as option. To order a dedicated temporary shaft together with Ball Screws, add alterations code "-TAS" to the end of a part number. **⊗** Nuts cannot be removed using the temporary shafts with Precision Ball Screw BSX, BSS, BSSE, C-BSS and Rolled Ball Screw C-BSSC.

Alterations	Part Number	-	L	-	F	-	P	-	(TAS)
	BSSZ1510	-	300						TAS
	BSSR2005	-	700	-	F30	-	P12	-	TAS

• Caution on use of Temporary Shaft

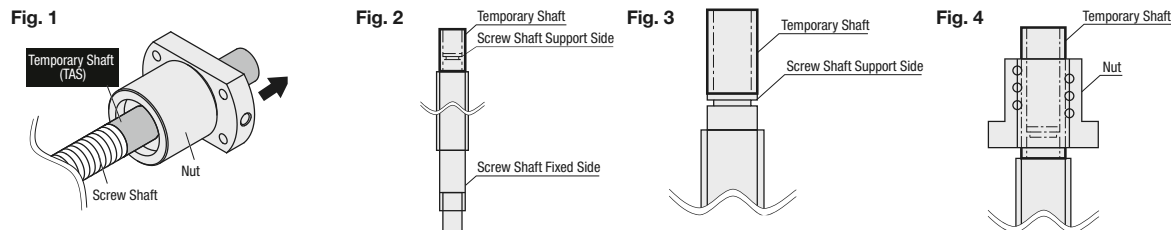
When Taking Out Ball Screws Nut from Screw Shaft

- Stand a screw shaft vertically and place a temporary shaft to the screw shaft support side edge in consistent with screw shaft center. (Refer to Fig. 2)^(*)
- Lightly rotate the nut and install it onto the temporary shaft. (Refer to Fig. 4)
- After confirming that both nut edges are on the temporary shaft, take out the temporary shaft from the screw shaft.
- Store the assembly while ensuring that the nut does not fall off of the temporary shaft.

When Installing Ball Screws Nut to Screw Shaft

- Stand a ball screw shaft vertically and place a temporary shaft to the screw shaft support side edge in consistent with screw shaft center.
- Rotate the nut with pressing the screw shaft lightly and install it into the shaft.
- In case there is any interference, do not insert the ball screw forcibly. Try reassembling.

(*) In BSSZ, BSSR0802, BSSR0804, BSSR1002, BSSR2510, BSST0802 and BSST2510, the screw shaft support side and the temporary shaft are placed as shown in the following Figure 3. Since TAS is unstable, grip TAS firmly from the above until the installation is finished.



■ Lubrication (grease inspection and replenishment)

The grease forms an oil film on the ball screw's screw shaft, rolling surface inside the nut, and surface of the balls and acts to reduce friction and prevent heat damage. MISUMI ball screws are filled with grease before shipping, however after commencing use, it is necessary to perform regular and appropriate inspection and grease replenishment. When adding grease, use the same grease that was used at shipment and do not mix with other greases.

• Guides for inspection and grease replenishment

After 2~3 months of operation, if the grease is very dirty, we recommend to remove the old grease and fill with new grease. Subsequent inspection intervals are recommended to be every 6 months, however, we recommend this timing be adjusted to an interval appropriate for the usage environment.

■ Available Grease

Ball screw products are shipped with grease filled. If not otherwise indicated, lithium soap based grease (Alvania Grease S2 made by Showa Shell Sekiyu K.K) is the standard type that is used. (BSX0601, BSX0801, and BSX0802 are filled with Multemp Grease PS2 made by Kyodo Yushi Co., Ltd.) Grease type can be changed from the standard to the following types.

Part Number	Product Name	Main Features				
● L Type	ET-100K (Made by Kyodo Yushi)	Excels in heat resistance, oxidation stability, adhesion and adhesive power. In addition, splash or leakage is little.				
● G Type	LG2 (Made by NSK Ltd.)	Special grease for linear guides, ball screws and etc. for clean-room use.				

Item	Condition	Unit	Measurement Method	Standard	L Type	G Type
Grease Performance	Thickener	-	-	-	Lithium Type	Lithium Type
	Base Oil	-	-	-	Mineral Oil	Ether Synthetic Oil
	Base Oil Viscosity	40°C	-	-	131	103
	Viscosity	100°C	mm ² /s	JIS K2220 5.19	12.2	12.8
	Worked Penetration	-	-	JIS K2220 5.3	283	207
	Dropping Point	-	°C	JIS K2220 5.4	181	<260
	Evaporation Amount	99°Cx22h	wt%	-	0.15%	1.40%
	Oil Separation Rate	100°Cx24h	wt%	JIS K2220 5.14	2.8%	1.2%
	Operating Temp.	In Air	°C	-	-25~+135	-40~200
						-10~80

- ⚠ Usage temperature is for grease performance and not the usable temperature of the ball screw.
- ⊗ Avoid using Ball Screws at a temperature of more than 0~80°C.

■ Available Ball Screws and Grease Types

Type	Accuracy Grade	Type	Unit Price (Add to the price of Standard Type)	
Precision Ball Screws	C 5	BSS	L≤1000	L>1000
	C 7	BSSE	● L Type	● L Type
	C 7	BSST	● G Type	● G Type
Rolled Ball Screws	C10	BSSR	● L Type	● L Type
		BSSZ	● G Type	● G Type
		BSSRK BSSZK		

⊗ Not applicable to Precision Ball Screw BSX, C-BSS, Rolled Ball Screw BSSC and C-BSSC.

Ordering Example	Part Number	-	L
	● BSS2010L	-	700 (L Type Greased)
	● BSS2010G	-	700 (G Type Greased)

⚠ Please add L or G after the part number of standard type when placing an order.

■ Design of Ball Screws and Peripherals, Caution when Assembling

Ball screws are parts that receive only axial load, when a radial load or moment load is received, it could cause sliding failure, vibration/abnormal noise and reduction in lifespan. To prevent parallelism error and misalignment of peripherals that causes radial load and moment load on ball screws, it is important to appropriately design and assemble peripherals.

• Misalignment of Ball Screw and Support Unit (Figure 1)

- Misalignment occurs when the shaft center of the ball screw fixed to the fixed-side support unit is misaligned with the center of the shaft bearing of the support unit on the support side.
- Misalignment allowance value (reference)
- 20μ or Less
- When there is high precision usage criteria or when using preloaded ball screws, keep the value as low as possible.

• Parallelism of ball screw and linear guide (Figure 2)

- Parallelism error is where the ball screw is tilting toward up/down or left/right with respect to the linear guide or other references.
- Tilting allowable value (reference) (Figure 3)
- 1/2000 or Less
- When there is high precision usage criteria or when using preloaded ball screws, keep the value as low as possible.

• Caution During Design

Design/machining precision of ball screw peripherals can be factors that cause misalignment and tilting. Particularly be cautious of the following two points.

- Flatness of base plate
- Dimensional precision from edge of support unit to shaft center

• Precautions on Installation

- Mounting/assembly of ball screw peripherals can cause misalignments and tilting. Particularly be cautious of the following four points.
- Error in left/right direction of support unit (Figure 1)
- Parallelism error of linear guide and ball screw (Figure 2)
- Fixing of table and nut bracket
- Fixing of ball screw nut and nut bracket
- If abnormal noise/sliding is being caused by the ball screw movement after assembly, loosen each of the fastened parts again and reassemble while ensuring smooth sliding.

Figure 1 Misalignment of Ball Screw and Support Unit

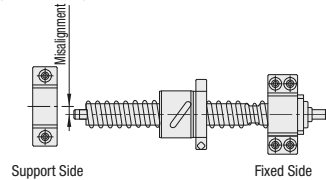


Figure 2 Parallelism Error of Linear Guide and Ball Screw

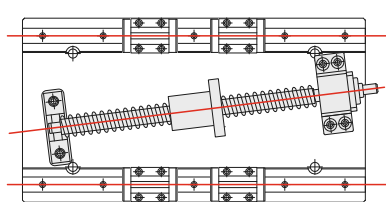


Figure 3 Tilt of Ball Screw and Nut Bracket

