

## Rust prevention and Lubrication

### ● Rust prevention

KSS Ball Screws are applied anti-rust oil when shipping in case of no specific instruction. This oil should be removed before use. Wash Ball Screws with cleaned Kerosine and apply lubricant (Grease or Oil) on Ball Screws. As customer's request, specified Grease or Oil can be applied, but it should be noted that they are not suitable for long term storage purpose and rust might occur.

Note) Anti-rust oil is focused on anti-rust performance and it does not have lubricating function. Therefore, when using Ball Screws with anti-rust oil coating, the problems such as shortened Life, increase of Torque and abnormal heat generation occurs.

### ● Lubrication

In Ball Screw use, lubricant should be required. If lubricant is not applied with, the problem such as increase of Torque and shortened Life occurs. Applying lubricant can minimize temperature increases, decline of mechanical efficiency due to friction, and deterioration of accuracy caused by wear.

Ball Screw lubrication is divided into Greasing and Oiling. A regular lithium-soap-based Grease and ISO VG32-68 Oil (turbine Oil #1 to #3) are recommended. It is highly important to choose lubricant depending on customer's usage. Especially in case of Miniature Ball Screws, malfunction such as increase of Torque are caused by the stir resistance. KSS original Greases which maintains Ball Screw's smooth movement and have high lubricating performance are prepared. MSG No.1 is appropriate for high smooth requirement and high positioning usage (consistency 1). MSG No.2 is suitable for high speed and general usage (consistency 2). Please refer to page B101 [Original Grease for Miniature Ball Screws].

### Recommended lubricants for normal operating conditions

Lubricant	Type	Product name
Grease	Lithium-based Grease	KSS original Grease MSG No.2
Lubricating Oil	Sliding surface Oil or turbine Oil	Super Multi 68

### ● Inspection and replenishment

Grease inspection should be performed once every two to three months, and Oil inspection should be performed approximately weekly. Check the Oil or Grease amount and contamination at each inspection and replenish if needed.

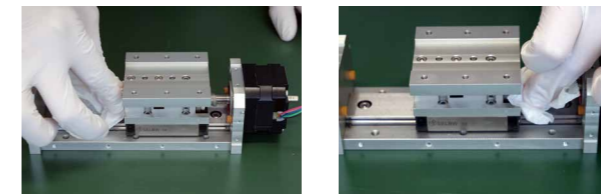
When re-greasing, the old or discolored one should be wiped off as much as you can.

### Inspection and replenishment Interval of lubricant

Lubrication	Inspection frequency	Inspection Items	Replenishment and replacement frequency
Automatic intermittent lubrication	Weekly	Oil level, contamination	Replenish at each inspection, depending on tank capacity
Grease	Every 2 to 3 months initially	Contamination, swarf contamination	Replenish annually or as necessary, depending on Inspection results The old or discolored grease should be wiped off before re-greasing.
Oil bath	Daily before operation	Oil surface check	Set a rule for replenishment as necessary, depending on amount of wear.

### ● Grease-up Procedure (Example)

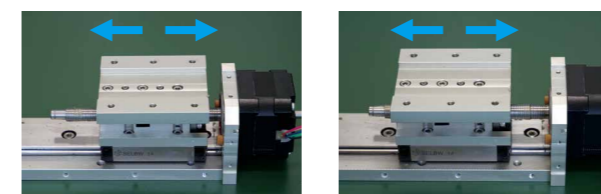
- 1) It is desirable to wear rubber gloves, not to handle Ball Screw by bare hand.
- 2) Wipe off discolored Grease on the Screw Shaft by using cloth or paper exclusive for wiping Grease or oil (e.g.: Kim Wipes by Kimberly-Clark Corp.).  
Move the Ball Nut to wipe off remaining Grease inside the Ball Nut as much as possible.



- 3) There is no oil hole on the flange for KSS Ball Screws as standard design, apply Grease entirely throughout the Screw Shaft.  
Please use the brush exclusive for applying Grease, or apply directly to the Screw Shaft by hand with wearing rubber gloves. If the Ball Nut has an oil hole, utilize it to fill in the new Grease.



- 4) In order to apply Grease entirely on the Screw Shaft, move the Ball Nut over full travel manually, or install in the device and do running-in.  
Remove any remaining Grease on either end of the Screw Shaft.



Please consult KSS for details.

## Dust prevention

In Ball Screws, if dust or other contaminations intrude into the Ball Nut, wear is accelerated, the screw groove will be damaged, circulation will be obstructed due to Ball fracture, damage of recirculation parts and so on. Eventually, the Ball Screws will cease to function. Where the possibility of dust or other contaminant exists, the screw thread section cannot be left exposed, and dust prevention measure such as a bellows or Telescopic pipe must be taken.

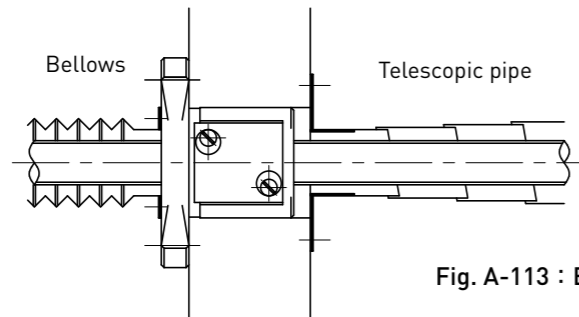


Fig. A-113 : Bellows & Telescopic pipe

KSS Ball Screws are concentrated on compact design for a feature of Miniature Ball Screw. Therefore, all models in the catalogue are the dimension without seals. Please inquire KSS if seals are required. Please note that Nut dimension may change due to seal installation. Some models cannot install the seals.

## Surface treatment

Surface treatment can be possible for the purpose of rust prevention. Very Low temp. Black Chrome treatment (BCr) is KSS standard surface treatment for the purpose of rust prevention. Please inquire KSS if other surface treatments are needed.

### ● Feature of KSS Ball Screws with Very Low temp. Black Chrome (BCr) coating

- Due to thin film thickness, mating part can be applicable with BCr.
- Due to strict production management, film thickness can be treated equally and smoothness is kept.
- High anti-rust ability is possible.
- To improve sliding characteristics, BCr+fluorine resin coating is also available.



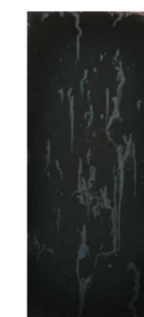
Photo A-114 : Very Low temp. Black Chrome coating

### ● Examination data of anti-rust ability

Based on the salt spray corrosion test (JIS Z2371), anti-rust ability has been evaluated, as follows.

- Standard test piece : 70mm × 150mm × 1mm (material = SPCC)
- Data : Evaluated by appearance and rating number method after 24 hours of salt spray corrosion test. (The less number, the more corrosion)

	Rating number (Average)
Sample A (BCr coating)	9.3
Sample B (R coating)	9~8
Sample C (M coating)	3~4



Sample A



Sample B



Sample C

### ● About RoHS compliance

The amount of hexavalent Chromium in KSS Very Low temp. Black Chrome (BCr) coating is less value than the based on RoHS regulation.