Q&A

Question:　How can KSS control or check the Preload?

Generally, it is not easy to measure the Preload directly. So, in production, KSS measures the Preload Dynamic Torque instead. Preload Dynamic Torque can be converted from Preload. This method is authorized by JIS B1192-1997 (Ball Screws). Conversion formula of Preload into Preload Dynamic Torque is as follows.

$$T = 0.05 \times (\tan \beta)^{-0.5} \times \frac{Fa \cdot \ell}{2\pi} \times 10^{-3} \quad N \cdot m$$

$$T = 0.05 \times (\tan \beta)^{-0.5} \times \frac{Fa \cdot \ell}{2\pi} \times 10^{-1} \quad kgf \cdot cm$$

T : Preload Dynamic Drag Torque　　N·m {kgf·cm}
β : Lead angle　　deg
Fa: Preload　　N {kgf}
ℓ : Lead　　mm

This Preload Dynamic Torque variation is prescribed in JIS as its permissible value depending on accuracy grade and thread length.

Then, Miniature Ball Screws manufactured by KSS are small size Ball Screws, so that Preload and Preload Dynamic Torque are also small accordingly. Most of them are out of JIS standard range. Because of this we measure the Preload Dynamic Torque in the purpose of check whether Axial play is zero or not based on our own criteria. Our measurement method is to use Hand-Torque gauge shown in photo below, and we check whether Preload Dynamic Torque is within the criteria on drawing. If you require more accurate data, KSS can provide Torque chart like graph below.

Torque Measurement example （トルク測定例）
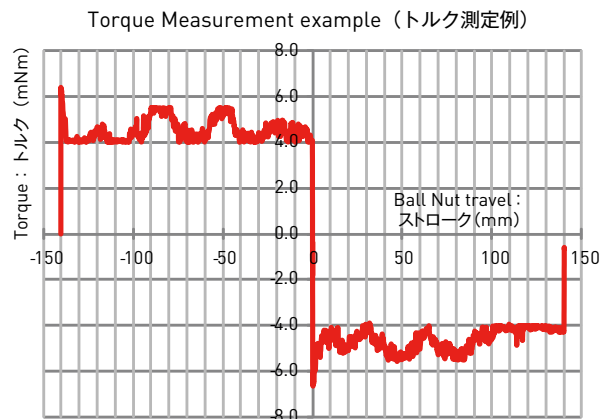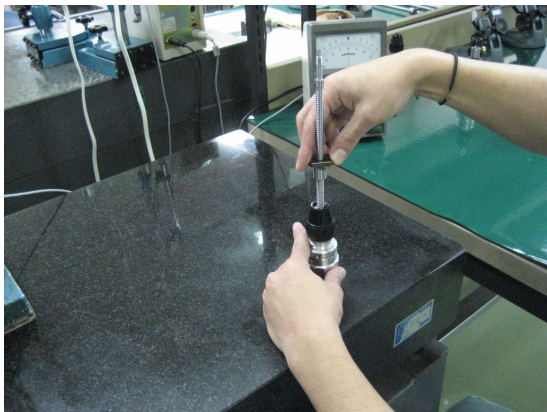
Pre-load （zero backlash） is confirmed by measuring dynamic Torque!!!