

Q&A

Question: Tell us about dn value.

Permissible speed of Ball Screws is the lower one, either the calculated revolution by resonance or dn value. Dn value is multiplied Shaft dia. (or Ball Center dia.) of revolution as shown below.

$$dn = d \text{ (Shaft dia. or Ball Center dia.)} \times n \text{ (revolution)}$$

Ball Screws have many Balls between Shaft and Nut, and re-circulation parts are put on so that Balls circulate endlessly inside the Nut. When Ball Screw rotates, Balls inside Nut revolve depending on the rotary speed. In other words, Balls always repeat coming in and getting out the re-circulation part, so Balls collide with re-circulation part each time.

The value that this re-circulation part is damaged by the collision of the Balls, is called dn value. Each Ball Screw manufacturer sets the limit value (dn) based on their experience or evaluation test. Generally, dn value is said 70,000 to 100,000, or 150,000 for high speed specifications.

For example, Ball Screw (40mm of Shaft dia.) with 100,000 as dn, limit of revolutions is as follows.

$$n = 100,000 / 40 = 2,500 \text{ rpm, This is the limit of revolution.}$$

If we apply this formula to KSS Miniature Ball Screws, unbelievably high number of revolution would be a limit, so it is unsuitable for the actual usage. Because of this reason, KSS does not adopt dn value, we use the limit of revolution value instead.

KSS considers 3,500 to 4,000 rpm as a limit number of revolution for Miniature Ball Screws, which is the limit of not be damaged on re-circulation part.

The dn value is not realistic for Miniature Ball Screws!!!