

2.3. Selecting a Spline Nut

Use the dynamic permissible torque and the pV value as a measuring stick for selecting a spline nut. For details, see the section on the selection of a nut on page M-7.

The values p and V required to obtain the pV value of the Spline Nut is calculated from the following equation.

Calculating Contact Surface Pressure p

$$p = \frac{P_T}{T} \times 9.8$$

where

- p : Contact surface pressure on the tooth under a load torque (P_T) (N/mm²)
 T : Dynamic permissible torque (N-m)
 P_T : Applied torque (N-m)

Calculating the Sliding Speed

With splines, the sliding speed of the teeth is equal to the feeding speed.

- V : Sliding speed of the tooth (m/min)

[Example of calculation]

Use Spline Nut DPM and reciprocate it at speed in the axial direction of 5 m/min while transmitting a load torque of 78 N-m. Since the applied torque is not consistent in direction, it is important to select a spline nut that can be used in locations accompanied by vibrations and impact.

First, select a nut that has a dynamic permissible torque (T) at which it can be used.

$$T \geq \frac{f_s \cdot P_T}{f_T} = \frac{4 \times 78}{1} = 312 \text{ N-m}$$

Safety factor (f_s)	=4
Temperature factor (f_T)	=1
Load torque (P_T)	=78 N-m

Select Spline Nut model DPM3560 (dynamic permissible torque T = 443 N-m), which satisfies the dynamic permissible torque (T) above.

Second, obtain the pV value.

Obtain the contact surface pressure (p).

$$p = \frac{P_T}{T} \times 9.8 = \frac{78}{443} \times 9.8 \div 1.73 \text{ N/mm}^2$$

Obtain the sliding speed (V).

$$V = 5 \text{ m/min}$$

From the diagram of pV values (Fig. 2) on page M-7, it is judged that there will be no abnormal wear if the sliding speed (V) is 13.5 m/min or below against the "p" value of 1.73 N-m. Therefore, it is appropriate to select model DPM3560.