## 7.3. Static Safety Factor

The basic static load rating ($C_0a$) generally equals to the permissible axial load of a Ball Screw. Depending on the service conditions, it is necessary to take into account the following static safety factor against the calculated load. When the Ball Screw is stationary or operative, unexpected external force may be applied through inertia caused by impact or start/stop.

$$Fa_{max} = \frac{C_0a}{f_s} \quad \cdots\cdots\cdots (26)$$

where

$Fa_{max}$ : Permissible axial load (kN)
$C_0a$ : Basic static load rating* (kN)
$f_s$ : Static safety factor (see table 1)

Table 1 Static Safety Factor ($f_s$)

| Machine using the LM system | Load conditions | Lower limit of $f_s$ |
|---|---|---|
| General industrial machinery | Without vibrations or impact | 1 to 1.3 |
| | With vibrations or impact | 2 to 3 |
| Machine tools | Without vibrations or impact | 1 to 1.5 |
| | With vibrations or impact | 2.5 to 7 |

* The basic static load rating ($C_0a$) is a static load with a constant direction and magnitude whereby the sum of the permanent deformation of the rolling element and that of the raceway on the contact area under the maximum stress is 0.0001 times the rolling element diameter. With the Ball Screw, it is defined as the axial load.
Specific values of each Ball Screw model are indicated in the dimensional table for the corresponding model number in the "THK General Catalog - Product Specifications," provided separately.