

## 4. Estimating the Rigidity

### 4.1. Selecting a Radial Clearance (Preload)

Since the radial clearance of an LM Guide greatly affects the running accuracy, load carrying capacity and rigidity of the LM Guide, it is important to select an appropriate clearance according to the application. In general, selecting a negative clearance (i.e., a preload\* is applied) while taking into account possible vibrations and impact generated from reciprocating motion favorably affects the service life and the accuracy.

For specific radial clearances, contact **THK**. We will help you select the optimal clearance according to the service conditions.

The clearances of all LM Guide models (except model HR, GSR and GSR-R, which are separate types) are adjusted as specified before shipment, and therefore they do not need further preload adjustment.

Table 1 Types of Radial Clearance

Radial Clearance			
	Normal clearance	Clearance C1 (light preload)	Clearance C0 (moderate preload)
Service conditions	<ul style="list-style-type: none"> <li>●The loading direction is fixed, impact and vibrations are minimal and 2 rails are installed in parallel.</li> <li>●Very high precision is not required, and the sliding resistance must be as low as possible.</li> </ul>	<ul style="list-style-type: none"> <li>●An overhang load or moment load is applied.</li> <li>●LM Guide is used in a single-rail configuration.</li> <li>●Light weight and high accuracy are required.</li> </ul>	<ul style="list-style-type: none"> <li>●High rigidity is required and vibrations and impact are applied.</li> <li>●Heavy-cutting machine tool</li> </ul>
Sample applications	Beam-welding machine, book-binding machine, automatic packaging machine, XY axes of general industrial machinery, automatic sash-manufacturing machine, welding machine, flame cutting machine, tool changer, material feeder	Grinding machine table feed axis, automatic coating machine, industrial robot, high-speed material feeder, NC drilling machine, vertical axis of general industrial machinery, printed circuit board drilling machine, electric discharge machine, measuring instrument, precision XY table	Machining center, NC lathe, grinding stone feed axis of grinding machine, milling machine, vertical/horizontal boring machine, tool rest guide, vertical axis of machine tool

\* Preload is an internal load applied to the rolling elements (balls, rollers, etc.) of an LM block in advance in order to increase its rigidity.