



Limiting speed for spindle bearings

The stable operation condition of a bearing is endangered as soon as the limiting speed is attained or exceeded. Within the range of the contacting areas between the balls and the rings friction and temperature increase progressively.

Limiting speed for spindle bearings

The speeds listed in the table are attainable speeds for a single spring-preloaded bearing operating under normal conditions such as:

- Good heat dissipation
- Low external load
- Rotating inner ring
- Oil-mist or oil-air lubrication
- Good form accuracy of associated components
- Alignment of associated components











The friction generated in the bearing depends essentially on:

- Speed
- Bearing load
- Viscosity of the lubricant
- Amount of lubricant

If the operating conditions deviate from the conditions mentioned these must be taken into account by correction factors.

Correction factors and speed values are only for guidance.

$$\text{Permissible speed} = \text{speed value} \cdot f_{n1} \cdot f_{n2} \cdot f_{n3} \cdot f_{n4}$$

Correction factors			Preload			
			F	L	M	S
f_{n1} : Lubrication	Grease lubrication (note n x dm factor of grease)	0.75				
	oil-air or oil-mist lubrication	1.0				
f_{n2} : Bearing arrangement Bearing pairs	Single bearing with spring preload	 	1.0			
	Rigid			0.8	0.7	0.5
						
				0.75	0.6	0.4
						
				0.7	0.6	0.4
						
		0.6	0.5	0.3		
		0.65	0.5	0.3		
f_{n3} : Kinematics	Rotating inner ring	1.0				
	Rotating outer ring	0.6				
f_{n4} : Ball material	Steel	1.0				
	Ceramic Si ₃ N ₄	1.25				