6. Speed and High Temperature Suitability

6.1 Maximum Rotational speed

The permissible rotational speed is given in the Catalogue for two kinds of lubricates: grease and liquid oil. However, it does not mean that the maximum rotational speed is acceptable at any load. The ultimate factor limiting the speed is temperature which depends on friction in the bearing and on the heat removal possibility. The limiting values of rotational speed given in the Catalogue are based on the following assumptions: the operating radial clearance is sufficient to enable compensation of the difference in the linear expansion between the outer and inner rings caused by their being heated to different temperatures; the assembly uses rigid shafts and housings; the lubricant is properly selected. The amount of the maximum permissible load is determined by the temperature factor.

The maximum rotational speed found in the Catalogue can, in certain cases, be exceeded by changing the loading conditions and the lubricant. However, in this case, care must be taken to apply a strictly specified dose of properly selected lubricant and to ensure removal of heat arising from friction. A further significant increase of the above-mentioned maximum rotational speed can be made possible by improvement of the bearings design, primarily that of bearing cages, by developing better lubricants, etc. Whenever problems arise in connection with the operation of bearings at higher rotational speed, please consult our personnel.

6.2 Temperature Suitability

FBJ bearings are heat treated in such a way that they can be used at operating temperatures of up to 120ºC. Bearings with polyamide cages can be used operating temperatures of up to 100ºC only.

If bearings are designed for operation under high temperature conditions, their life expectancy gets somewhat lower because of reduced hardness and fluctuation of the impact viscosity level. In order to prevent the parts dimensions form being changed, they are additionally tempered at high temperatures exceeding the maximum operating temperatures of bearings. Such bearings carry additional marking symbols placed to the right of the location of the bearing designation. Table contains the values of the selected dynamic load-carrying capacity should be multiplied depending on the bearing operating temperature.

Table 6.1 Speed and High Temperature Suitability

Bearing Operating Temperature, ˚C	Temperature coefficient
160	0.90
180	0.85
200	0.80
250	0.71
300	0.60