Ball Bearings

Designing to Lower Cost

The majority of applications can be effectively handled using a “standard bearing.” A “standard bearing”, in this case, refers to a bearing that is in such worldwide demand that large volumes are produced. This virtually guarantees continuity of supply while assuring pricing benefits for the customer. Selection of a “standard bearing” at the design stage cannot be over emphasized. The considerations necessary to design for lower cost include:

- Dimensional size
- Material type
- Lubrication
- Enclosures
- Cage style (retainer)
- Manufacturability
- Assembly and fits
- Packaging
- Quality requirements

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Although different designers may vary in their approach to bearing selection, the following is one method that works well.

- Establish operating, environmental and performance requirements such as load, speed noise, etc.
- Select a bearing configuration to meet the above requirements.

Some examples of configuration types are:

1 – Flanged or unflanged

2 – With or without a snap ring

3 – Ball complement/size

- Determine bearing envelope to accommodate shaft and housing requirements. This step is critical to cost. It is quite often more cost-effective to design the housing and shaft around a popular bearing size than vice versa.
- Specify enclosures as necessary. Be careful not to specify a more expensive enclosure than necessary to perform properly in the application.
- Specify required cage type. For the majority of cases, the standard cage for a particular chassis size will be adequate.
- Determine the bearing noise rating that is required for the application. For most cases, our stand “No Code” noise rating will provide quieter operation than most other components in the system. For extremely noise sensitive applications, a quieter noise rating can be specified.
- Determine degree of precision needed to achieve the performance requirements (ABEC Level). Do not over estimate what is truly necessary to achieve the desired performance.

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- Determine the radial play specification. The standard radial play specification for a chassis size will be adequate to handle normal press fits, moderate temperature differentials and normal speeds.

- Determine lubrication requirements. This should include lubrication characteristics and the amount of lubricant needed. This is a critical step in the performance and reliability of the bearing in the application.

Care should be taken throughout this process with respect to both cost and performance. The key in designing for the lowest total cost is to involve the sales and application engineering staff early in the selection process. Costs will be impacted greatly if the envelope dimensions are not given consideration at the time of bearing selection. Application engineers are there to help you in the design and selection process, insuring your success.

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About NMB Technologies Corporation - NMB Technologies Corporation, a Minebea Group Company, is the world's largest manufacturer of miniature precision ball bearings and a volume leader in the design and manufacturing of precision electro-mechanical components, including cooling fans, precision small motors and mechanical bearing assemblies, among others. NMB products can be found in the personal computing, networking, telecommunications, home entertainment, home electronics, automotive, medical and industrial markets.

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