BEARING SPECIFIC TOPICS

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Load Ratings & Bearing Life

The current standards for load ratings and fatigue life for ball bearings and for roller bearings are joint American National Standards Institute (ANSI) and Anti Friction Bearing Manufacturers Association (AFBMA) standards approved in 1978. The standards for load ratings and fatigue life for ball bearings is ANSI/AFBMA Std. 9-1978, and the standard for load ratings and fatigue life for roller bearings is ANSI/AFBMA Std. 11-1978.

These standards provide the equations and factors needed to calculate the Basic Load Rating for bearings of all types. Life calculation methods are also provided, and both standards discuss various life adjustment factors, such as for reliability, for material, and for application conditions.

The purpose of this report is to point out two important issues pertaining to these standards. The first is to remind distributors who have perceived themselves as “selling a commodity” that the bearing industry has made technological improvements in their product — improvements that should be emphasized with the user. You are selling a better product than you were ten years ago and should be able to explain why this is so and what it means to the user.

Also, since 1978, some bearing manufacturers have departed from the standards for life adjustment factors for bearing material and are instead showing increased load ratings in place of this life adjustment factor for material. In other words, some manufacturers are translating the improved bearing material into higher load ratings rather than longer bearing life. Consequently, the user can encounter a fairly wide range of load ratings and/or life adjustment factors, depending on the bearing manufacturer.

The AFBMA Engineering Committees are currently reviewing the two standards, to update them and bring them in line with some of the later thinking regarding adjustment factors for load rating, as well as adjustment factors for life. This has developed as a result of the work of the AFBMA, through ANSI, with the International Standards Organization (ISO). The ISO is now working to finalize a current standard for load ratings and life of all bearing types. The ISO seems to be taking the stand that load ratings can be adjusted to show material and/or manufacturing quality improvements, rather than considering these factors by life adjustment. The feeling seems to be that theANSI/AFBMA standards should be similar to, if not in conformance with, the ISO standards; therefore, when the current review of the ANSI/AFBMA is completed, it is possible if not probable that those standards will be quite similar to the ISO standard when it is finally approved.

Advances in bearing material, both standard and special, and application analysis, including effects of misalignment and lubricant quality and resulting life analysis, have been dramatic in the past few years. It is, therefore, always wise for a user to contact bearing manufacturers or their authorized distributor for current load rating and life analysis.

BSA appreciates the assistance of Mr. James A. Rader, Vice President - Engineering, McGill Manufacturing Company, in compiling this report.