would not have been appreciably different than the data presented in this paper (probably less than 5 percent for porous gas bearings used in practice).

Conclusions

Data are presented for determining both load and stiffness characteristics of double-pad bearings. From these curves, parameters can be chosen for a given bearing geometry, to optimize either load or stiffness. Generally, optimum values for both load and stiffness cannot be obtained so that, if both are important considerations in a particular design, a compromise would have to be made between the two optimum values.

As expected, double-pad bearings have higher static stiffness but lower load capacity than single-pad bearings. Therefore, double-pad bearings should be used only in situations where stiffness is very important or when two-directional stiffness or load characteristics are needed.

DISCUSSION

B. R. Reason

The authors have made a worthwhile contribution to the analysis of porous gas bearings particularly for this specific configuration.

During an experimental programme on fluid flow through porous bearing material, associated with numerical studies on porous journal bearings, the writer and his colleagues observed a very rapid diminution of effective porosity even with relatively fine filtration (of the order of 5 microns). Would the authors like to comment on the importance of filtration in the practical working bearing of the configuration they have analysed?

Authors’ Closure

The authors would like to thank Professor Reason for his thoughtful comment. We agree with his observation that porous surfaces are inherent filter systems whose permeability will change unless super clean gases are used. A problem with most porous surfaces is that, for a given permeability, the pore size varies over a large range with the smaller pores being easily clogged. The filtering problem might be reduced by using surfaces with a more uniform pore size. Such uniformity can be more easily obtained with wire mesh laminates consisting of one or more layers of wire cloth which are diffusion-bonded into a monolithic porous structure [10].

Even though the authors have no practical experience with such porous structures, it seems that, at least, the designer would have some ideas as to how fine a filtration system he needs so that appreciable changes in permeability do not occur.

Additional Reference


References