

## **INTRODUCTION**

Ball and roller bearings are used widely in instruments and machines in order to minimize friction and power loss. While the concept of the ball bearing dates back at least to Leonardo da Vinci, their design and manufacture has become remarkably sophisticated.

This technology was brought to its present state of perfection only after a long period of research and development. The benefits of such specialized research can be obtained when it is possible to use a standardized bearing of the proper size and type. However, such bearings cannot be used indiscriminately without a careful study of the loads and operating conditions. In addition, the bearing must be provided with adequate mounting, lubrication and sealing.

Design engineers have usually two possible sources for obtaining information which they can use to select a bearing for their particular application:

- a) Textbooks
- b) Manufacturers' catalogs

Textbooks are excellent sources; however, they tend to be overly detailed and aimed at the student of the subject matter rather than the practicing designer. They, in most cases, contain information on how to design rather than how to select a bearing for a particular application.

Manufacturers' catalogs, in turn, are also excellent and contain a wealth of information which relates to the products of the particular manufacturer. These catalogs, however, fail to provide alternatives – which may divert the designer's interest to products not manufactured by them.

Our Company, however, provides the broadest selection of many types of bearings made by different manufacturers. For this reason, we are interested in providing a condensed overview of the subject matter in an objective manner, using data obtained from different texts, handbooks and manufacturers' literature. This information will enable the reader to select the proper bearing in an expeditious manner.

If the designer's interest exceeds the scope of the presented material, a list of references is provided at the end of the Technical Section.

At the same time, we are expressing our thanks and are providing credit to the sources which supplied the material presented here.

The information deals with:

- a) Rolling Contact Bearings
  - b) Sintered-Metal Sliding Contact Bearings
- and
- c) Plastic and Nonmetallic Sliding Contact Bearings

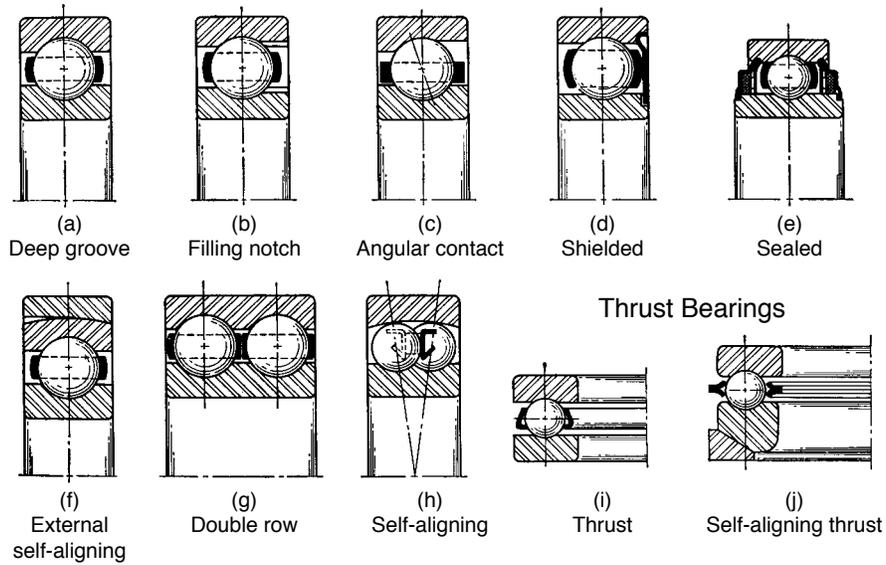
## **1.0 ROLLING CONTACT BEARINGS**

### **1.1 General**

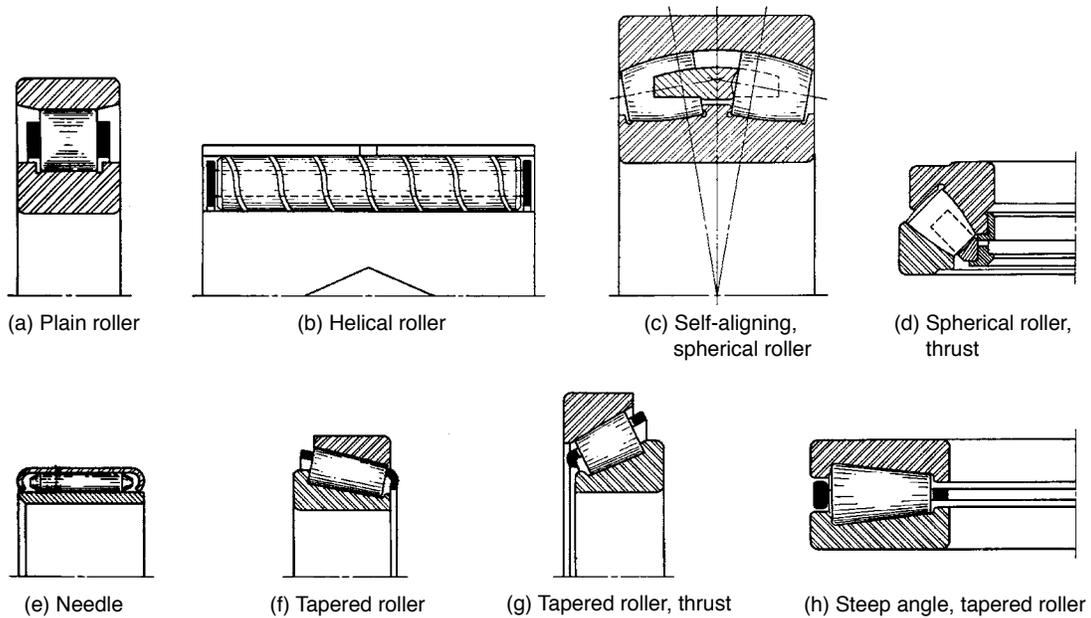
Rolling contact bearings can be divided into three basic groups:

- a) Ball Bearings
  - b) Thrust Bearings
- and
- c) Roller Bearings

Each of these groups can further be divided into subgroups. Rather than enumerating the subgroups, they will be shown in **Fig. 1-1** and **Fig. 1-2**.



**Fig. 1-1 Radial and Thrust Ball Bearings**



**Fig. 1-2 Radial and Thrust Roller Bearings**