

# Planar bearings

Planar bearings are made of self-lubricating resin and have the advantages of quiet and durable.

Plain bearings are very simple: two surfaces can move to each other without the help of rolling elements. The rotation of the shaft in the sleeve, the damping vibration of the vane, the expansion of the bridge and the chain through the groove can be used as all description of the plane bearing. The sleeve or flange bushing, thrust washer, linear sliding plate, friction bearing and wear resistant gasket belong to the category of plane bearings. Generally speaking, if a ball bearing no ball, thimble, cage or seat ring, it should be counted as a plane bearing.

In addition to simple structure and lower cost, planar bearings can also be made of resin with lubricant added. During the running of the bearing, the lubricant in the resin can migrate to the metal surface that is compatible with the bearing.

Polytetrafluoroethylene (PTFE), graphite, molybdenum disulfide and silicone are common lubricants added to resins. Although these materials are different from the microstructure of the match metal surface, their functions are all the same, that is, the service life of the bearing can be prolonged by reducing friction. Low friction means less heat, and the result is longer maintenance time.

Planar bearings can be applied to many industrial and outdoor environments. Bearing grade plastics can be selected according to their properties of fresh water, brine, deionized water, mud, acid or alkali. Due to the small number of moving parts of planar bearings, it will not be affected by particles such as coal ash, quartz or sand. Plain bearings are also suitable for use in cleanrooms because they produce very little debris and do not attract dust particles. Nowadays, many plastic bearing materials have been able to meet the requirements of FDA, USDA, 3A or NSF standards.

## Pressure performance

When choosing plastic bearings, the various aspects of application should be carefully considered. Although some design standards are applicable to all planar bearings, special design matters need to be noted for non-metallic bearings.

All bearings are generally rated by the maximum load or pressure (P), the maximum speed on the surface (V) and the product of the two (PV). Therefore, it is necessary to accurately evaluate P, V and PV in order to obtain longer maintenance cycle.

## Thermosensitive

Pay close attention to the working temperature of the bearing because all the plastics have a maximum continuous temperature. The temperature should be lower than the melting point, so that the material can maintain its physical properties and continue to use the highest

temperature. As the temperature rises, the properties of materials will decrease. Therefore, it is very important to understand the maximum instantaneous temperature and continuous working temperature of materials.

Thermal expansion and shrinkage coefficient are other properties that plastics should be aware of. The plane bearings cooperate and operate under pressure. If thermal expansion is not considered, pressure matching may cause problems, causing the shaft to be unable to rotate. Each plastic has different thermal expansion coefficients, so it must be assured that the bearing will not change in size throughout its service temperature range.