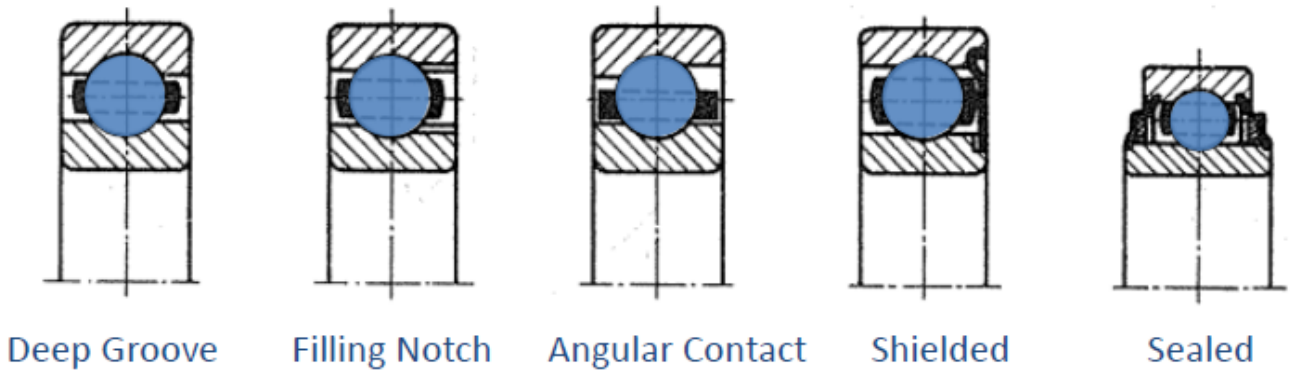
Structure Design - Bearing

tag: #fiboyear2

Overview

Rolling ball bearing is use to lower friction between parts (by using steel ball, turn sliding contact into rolling contact).

Type of Ball Bearing



- Deep groove
  - most commonly used
  - Little misalignment
  - Can handle thrust : radial loads = 0.7
- Filling notch
  - Can handle thrust load 20-40% higher than deep groove
  - Can add more ball to improve load capacity
- Angular contact
  - Can handle higher thrust load, but lower radial load
- Shielded
  - Prevent dust and oil leak
- Sealed
  - Like Shielded but permanent.

Type of Roller Bearing

- Cylindrical / Straight Roller
  - Can handle higher radial load than ball bearings due to larger contact surface
  - Cannot handle thrust load

- Taper Roller Thrust Bearing
  - Can handle both thrust and radial loads (depending on contact angle)
  - Little misalignment
- Needle Bearing
  - Used in limited space

Mounting Type

- One bearing at end of each shaft (1)
  Inner ring are backed up against the shaft shoulders and held in position by round nuts threaded
- One bearing at end of each shaft (2)
  Like the first one, but required accurate dimensions in axial direction, no retaining devices are required. This eliminates grooves or threads, which cause stress concentration on the overhanging end
  cons: expansion due to temperature may cause bearing to break (if the distance between the bearings is great).

Calculation

- Rating life
- Service factor
- Recommended life