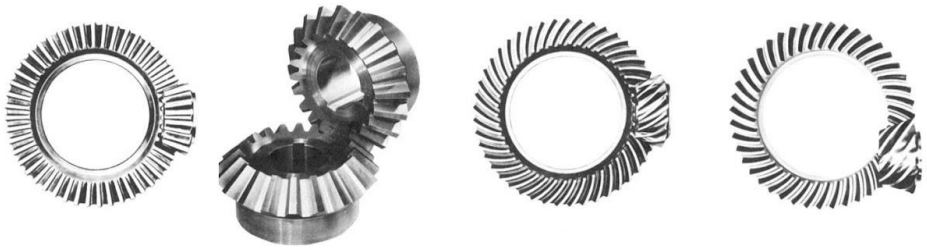
Bevel Gears

Bevel gears are gears which have the teeth tapered conical elements that have the same direction as the pitch cone base line (generatrix). The straight bevel gear is simple to produce and the most widely used type in the bevel gear family. Bevel gears are most commonly used for power transmission between intersecting shafts.

Classification of Bevel Gears

1. Straight-Bevel Gears
2. Miter Bevel Gears (Bevel Gears with gear ratio of 1)
3. Spiral-Bevel Gears
4. Hypoid gears



1. Straight bevel gear 2. Miter gear 3. Spiral bevel gear 4. Hypoid gear

Force acting on Bevel gears

Since bevel gears are cone shaped, they produce axial thrust forces. Especially for spiral bevel gears, the directions of thrust changes with the hand of spiral and the direction of rotation. The bearings must be selected properly to be able to handle these thrust forces

Due to the thrust load of bevel gears, the gears, shafts and bearings have the tendency to loosen up during operation. Bevel gears should be fastened to the shaft with keys and set screws, taper pins, step shafts, etc.

If a bevel gear is mounted on a shaft far from the bearings, the shaft may bend. It is recommend mounting bevel gears as close to the bearings as possible. This is especially important since most bevel gears are supported on one end. The bending of shafts will cause abnormal noise and wear, and may even cause fatigue failure of the shafts. Both shafts and

bearings must be designed with sufficient strength. The fig. below shows the force components acting in bevel gears.

F_t - Tangential force

F_r - Radial force

F_x - Axial force