Oldham couplings can accommodate lateral shaft misalignments up to 10% of nominal shaft diameters and up to 3 angular misalignments.

Lubrication is a problem but can in most applications be overcome by choosing a coupling that uses a wear resistant plastic or an elastomer in place of steel or bronze floating members.

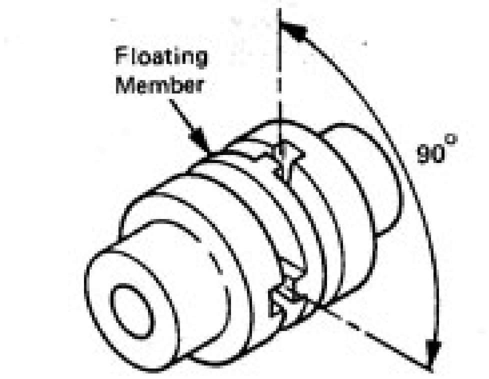

Figure 6 Oldham Coupling

Oldham couplings have the following advantages:
a. No velocity variation as with universal joints
b. High lateral misalignments possible
c. High torque capacity
d. Ease of dismantling

Disadvantages:
a. Limited angular displacement of shafts
b. Need for periodic lubrication due to relative sliding motion unless nylon or rubber construction is employed
c. Possible loss of loose members during disassembly

3.3 Flexible Shafts

Flexible shafts are stiff in torsion and very compliant in bending and lateral misalignments. A good example of this is in their use on automotive speedometer drives.

Flexible shafts Consist of:

a. Shaft — the rotating element consisting of a center wire With several wire layers wrapped around it in alternating directions.

b. Casing — the sleeve made from metal or non•metals to guide and protect the shaft and retain lubricants.

c. Case End Fitting — connects the casing to the housing of the driver and driven equipment.

d. Shaft End Fitting — connects the shaft to the driving and driven members.

Flexible shafts are also supplied without a casing when used for hand operated controls or intermittent powered appiications.

Flexible shafts as shown in the product section of the catalog are often substituted in place of more expensive gear trains and universal joints in applications where the toad must be moved in many directions.

They are extremely useful where the load Is located in a remote position requiring many gear and shafting combinations.

The basic design considerations are torque capacity, speed, direction of rotation, bend radii and service conditions.

Torque capacity is a function of the shaft size. Operating conditions must be considered in power drive applications such as starting torque, reversing shocks, and fluctuating loads. These conditions constitute overloads on the shaft. If they are substantially greater than the normal torque load, a larger shaft must be selected. Since in power applications torque is inversely proportional to speed, it is beneficial to keep the torque down thereby reducing shaft size and cost. Ordinarily speeds of 1750 to 3600 RPM are recommended. However there are applications in which shafts are operating successfully from 600 to 12,000 RPM. The general formula for determining maximum shaft speed is:

$$N = \frac{7200}{\pi d}$$

where N = R.P.M.
d = shaft dia. in inches