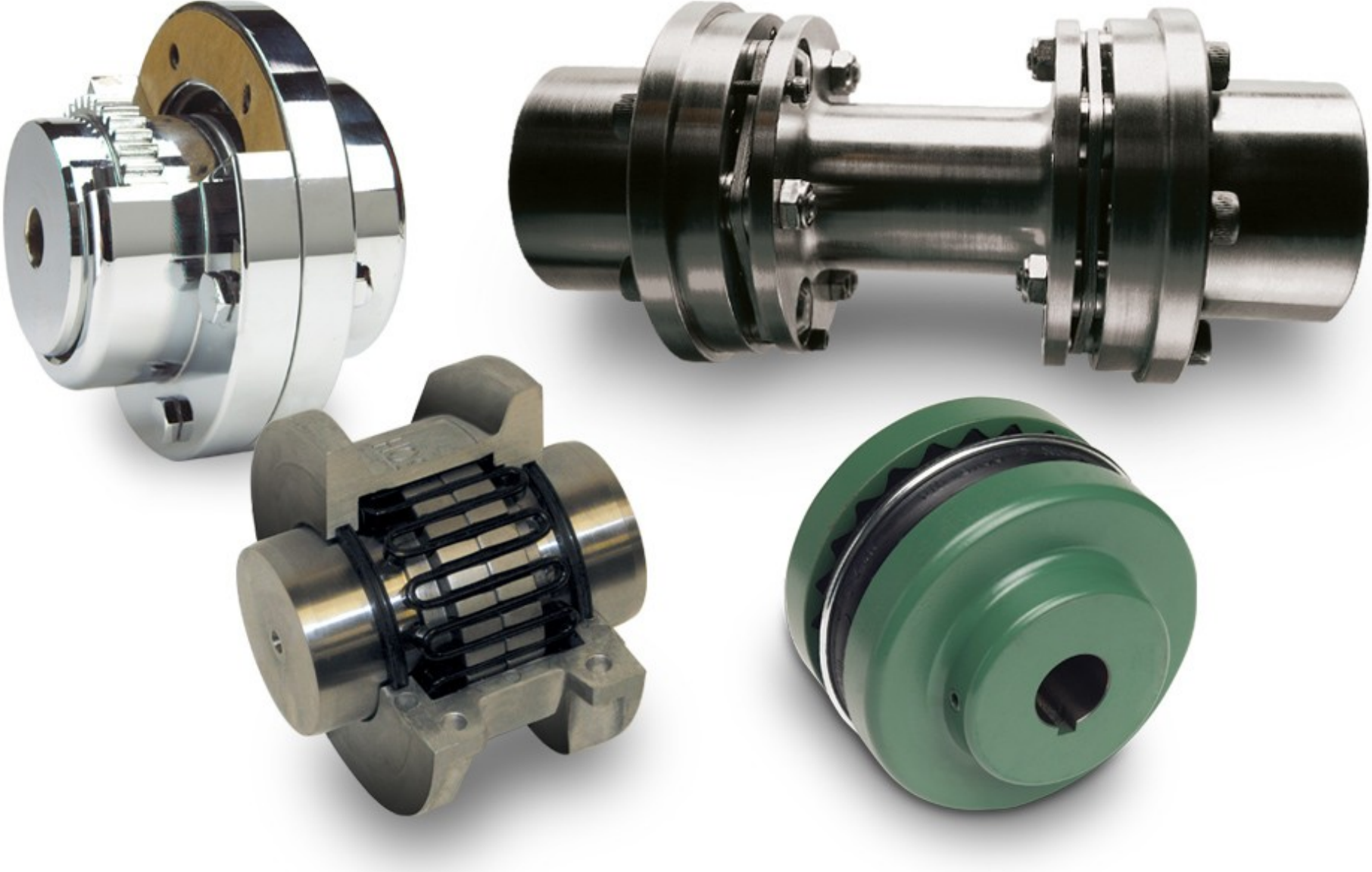


COUPLING

WHAT IS COUPLING ?

A device that is used to connect two shafts(Input Shaft & Output Shaft / driving shaft & driven shaft) together for the purpose of power transmission.

WHY DO WE NEED COUPLINGS ?

Power can be transmitted by means of various gear arrangements or drives only if the shafts are parallel.

Couplings are used when the shafts are in a straight line and are to be connected end to end to transmit power.

PURPOSE OF COUPLING ?

1. *Power Transmission*
2. *Joining misalignment of shafts*
3. *Reduce shock violation*
4. *Easy to assemble and disassemble*

TYPES OF COUPLING ?

- *General types of couplings are:*
  - *rigid: for aligned shafts*
  - *flexible: for non-aligned shafts*

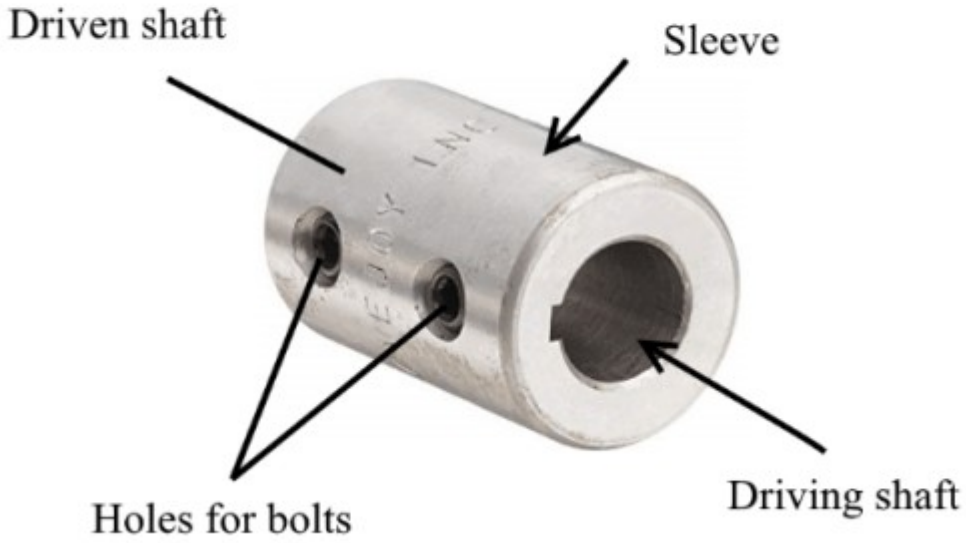
ALIGNED SHAFT COUPLINGS

*Aligned shaft couplings are **RIGID COUPLINGS** that are designed to draw two shafts together so that no motion can occur between them.*

- Types
  - Flanged
  - Split Coupler
  - Keyed
  - Friction

MUFF / SLEEVE COUPLING

Demo



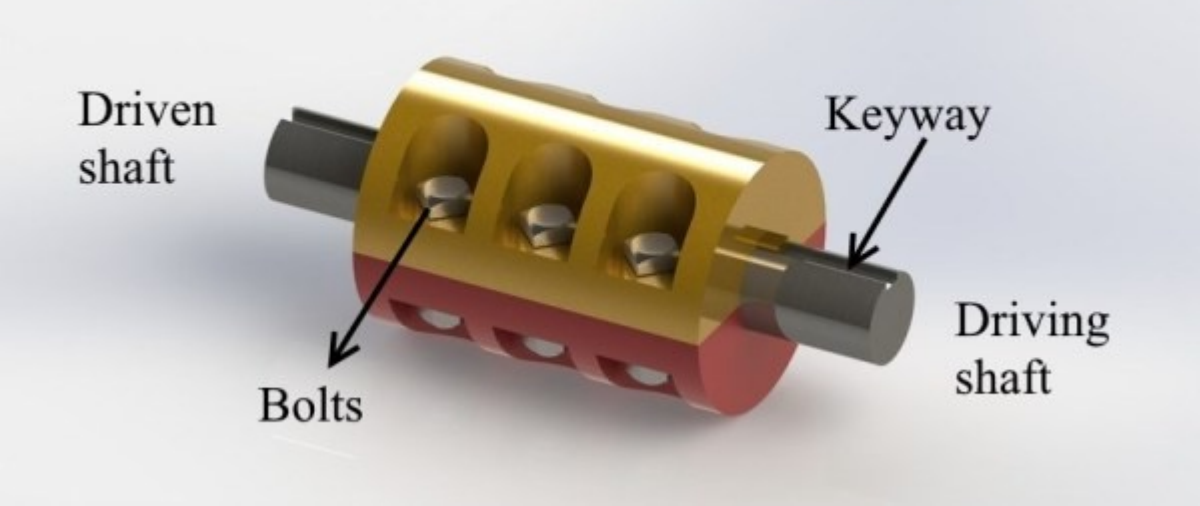
Sleeve couplings are nothing but just sort of thick hollow cylinder/pipe called as ***sleeve or muff.***

MUFF / SLEEVE COUPLING

The sleeve is manufactured keeping the diameter of shaft in mind so that the shaft fits perfectly into the sleeve.
The driver & driven, both the shafts are then inserted into each side of the sleeve.
Also two or more threaded holes are provided into the sleeve as well as in both of the shaft's end so that they don't move in longitudnal direction

Also the keyway and key ensures that the shaft and sleeve doesn't slip.

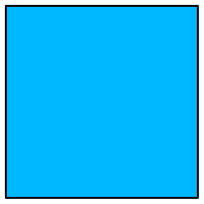
SPLIT MUFF / CLAMP COUPLING



In split muff coupling, the sleeve or muff isn't a single different part instead it is split into 2

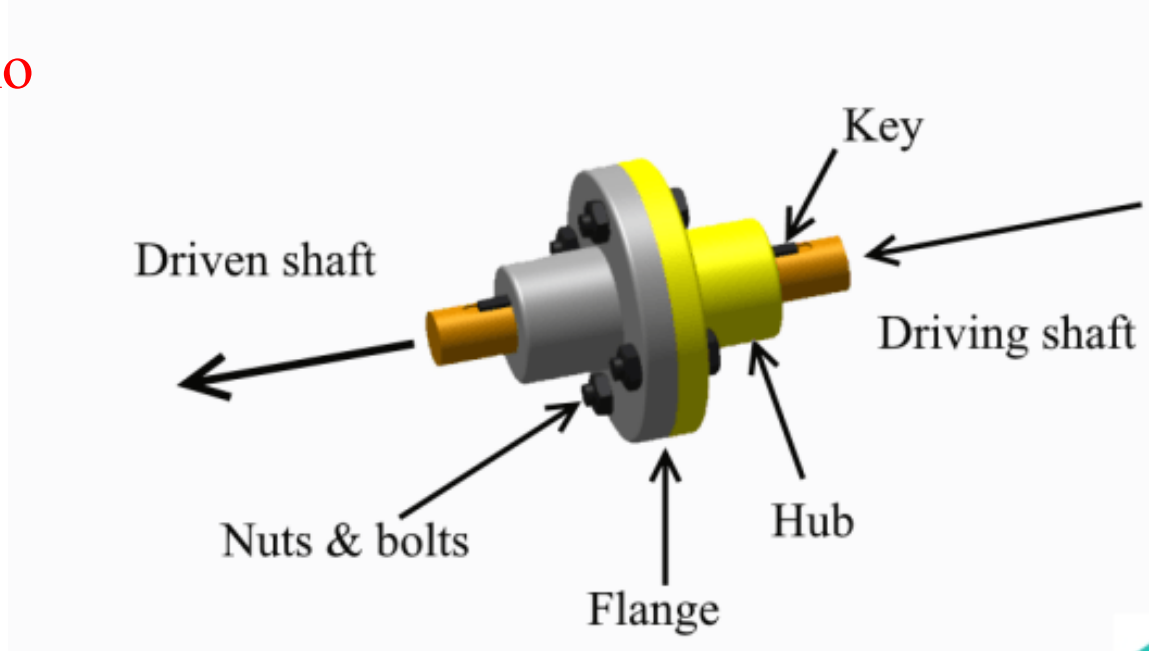
SPLIT MUFF / CLAMP COUPLING

In split muff coupling, the sleeve or muff isn't a single different part instead it is split into 2
The muffs are semi-cylindrical in shape which then fits over the shaft. Threaded holes are provided on the muffs so that both the shafts can be joined with steel bolts or studs.
The special feature of this coupling is that it can be assembled and disassembled without changing the position of shaft.
Application-
They are used for medium to heavy duty load with moderate speed.



FLANGED COUPLING

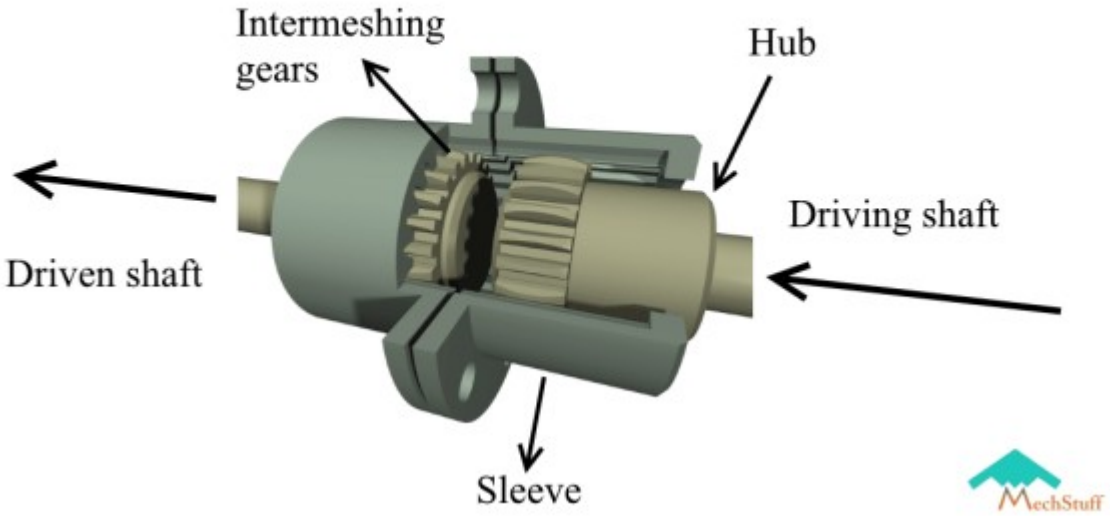
Demo



A key is used to to fix the coupling to the shaft, and then couplings are bolted together.

GEAR COUPLING

Demo



*The gear coupling is another **modified version of the FLANGE COUPLING***

GEAR COUPLING

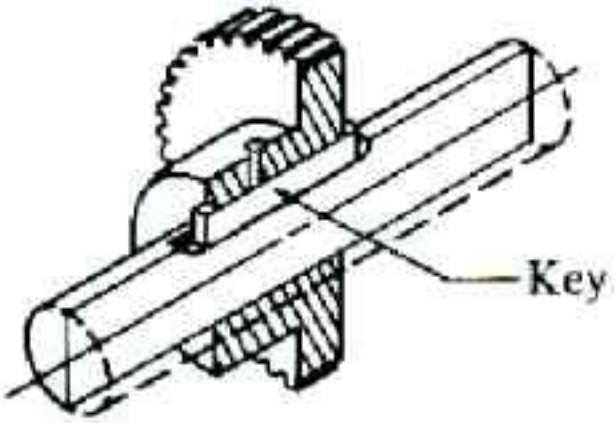
In gear coupling, the flange and hub are different parts assembled together instead of a single part as in flange coupling.

The hubs are externally splined but they are so thick and deep that you can regard them as gear teeth. Also the flanges have internal teeth. The gear ratio is 1:1 and are meshed together. The single joint gear couplings are limited to lower angular misalignments.

Application-

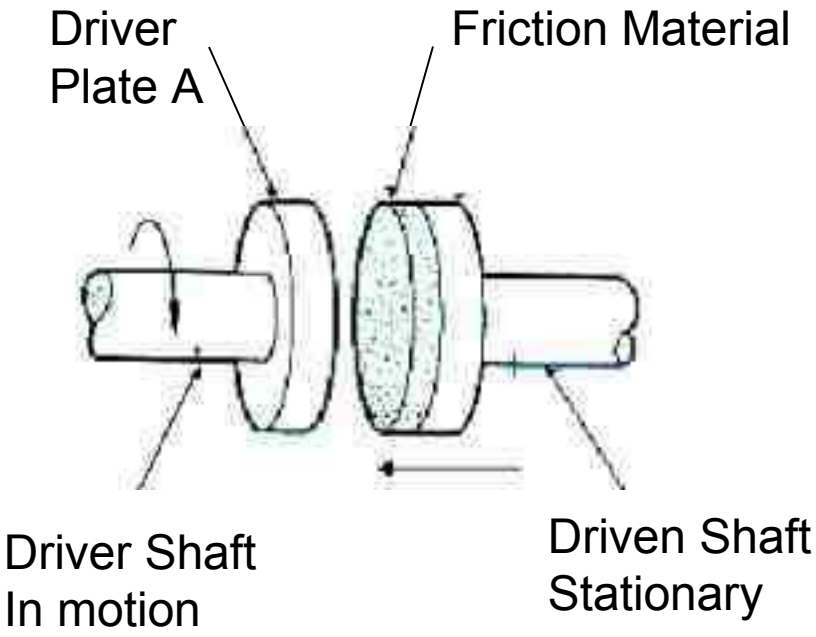
Gear couplings are used for heavy-duty applications where requirement of torque transmission is higher.

Keyed Coupler

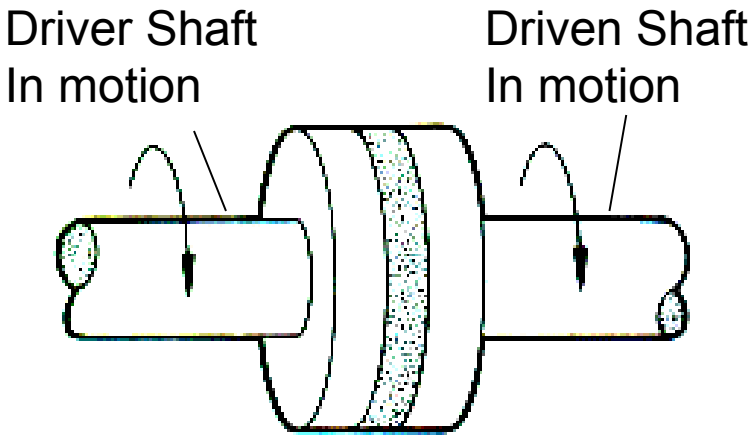


- Grooves are cut into the shaft and the fixed part.
- A key is put in the grooves to lock the two parts together.

Friction Coupling



Clutch Disengaged

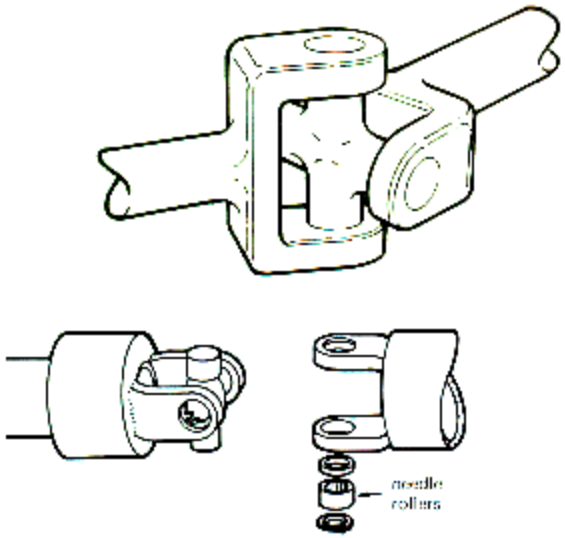


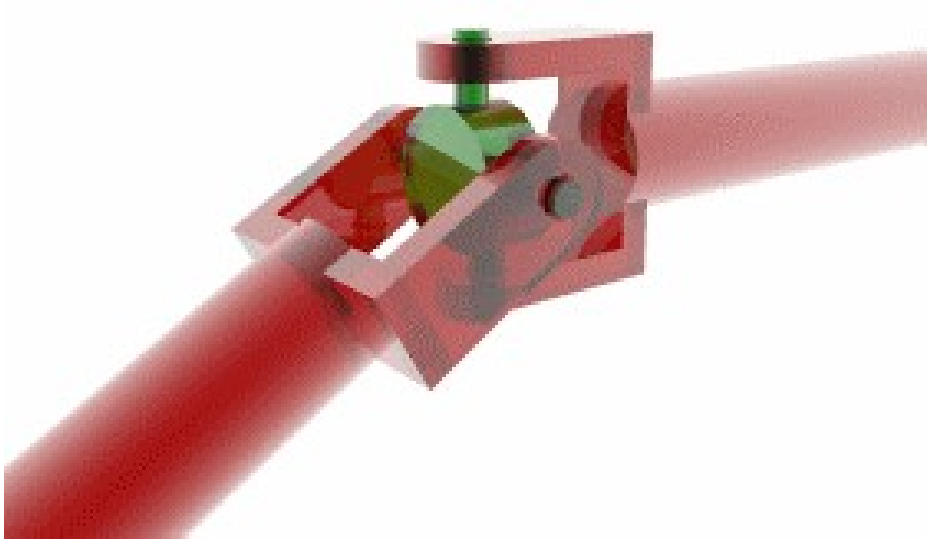
Clutch Engaged

NON-ALIGNED SHAFT COUPLINGS

- Used to join ***SHAFTS THAT MEET AT A SLIGHT ANGLE / INTERSECTING SHAFTS***
- Angle may still change while running due to vibration or load.
- Types:
  - Universal
  - Constant Velocity
  - Flexible

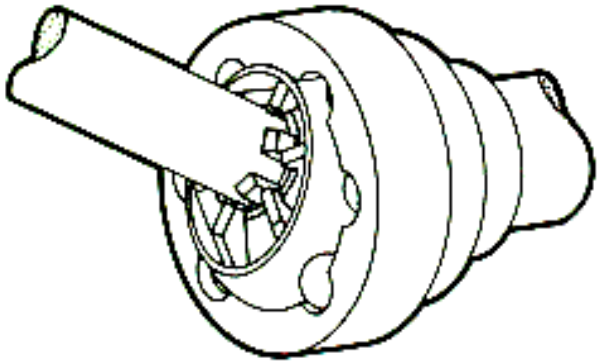
UNIVERSAL JOINT COUPLING

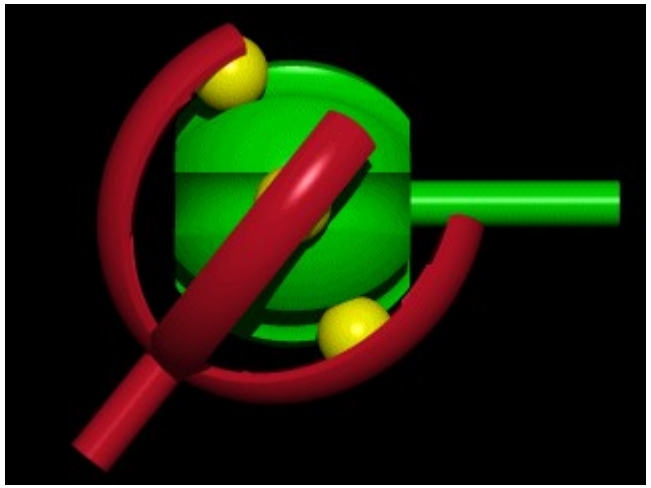




- Consist of two end yokes and a center bearing block.
- Provides for angular misalignment of up to 45 degrees.

CONSTANT VELOCITY JOINT





- Used where angles are greater than 20 and there is no room to use two universal joints.
- Driven shaft maintains a constant speed regardless of driver shaft angle.
- Used on driveshafts on front wheel drive cars.

FLEXIBLE COUPLING

Where shafts cant be aligned properly

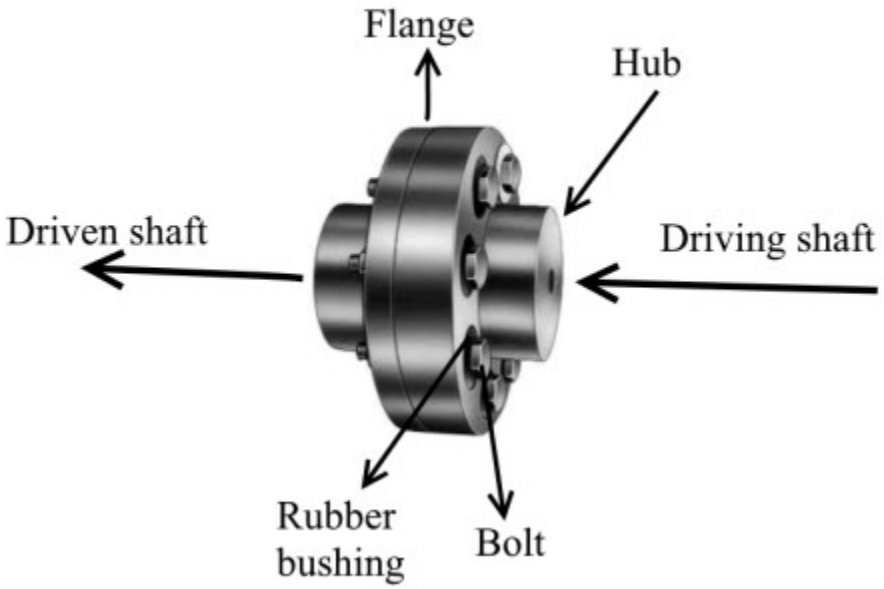
Best for

- Power Transmission

Limitation

- Costly / complex construction

FLEXIBLE - BUSH PIN COUPLING



Able to Manage:

1.0.1 to 0.5 mm eccentricity

2.Minor angular misalignment(up to 3 degree)

Suitable for :

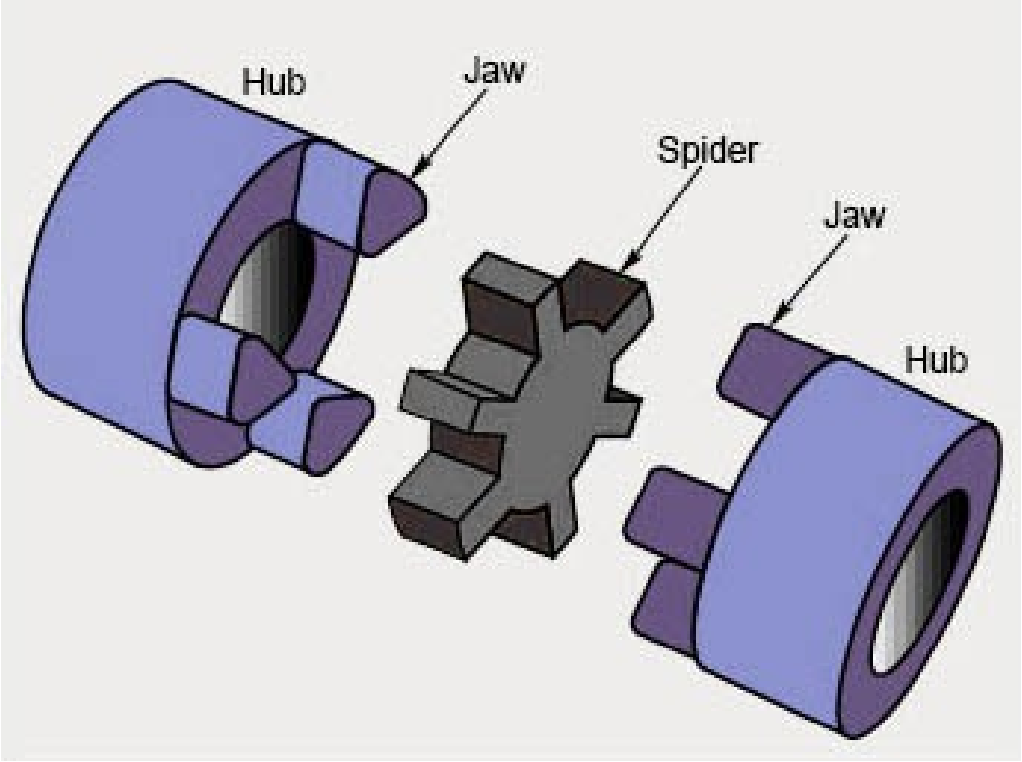
High Torque transmission

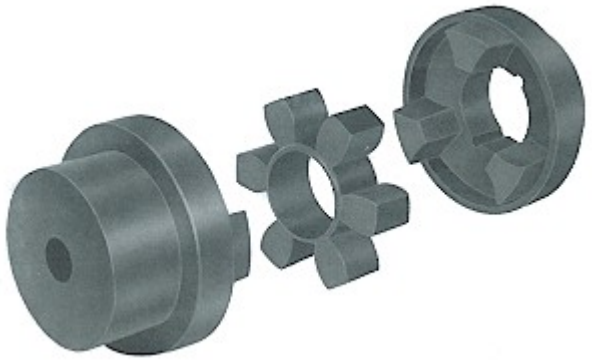
TYRE COUPLING

TYRE COUPLING

- *Acts as Self-Aligning Agent*
- *Avoids Metal Contact*
- *Smoothness Vibration*
- *Gives Life to Bearings*
- *Removes Unpleasant Sound*
- *Takes End Level Shock Load*
- *Makes Easy Replacement*
- *Suits to Vertical Drive*
- *Avoids Cost Against Breakdown*
- *Decreases Temperature Rise*

JAW & SPIDER COUPLING





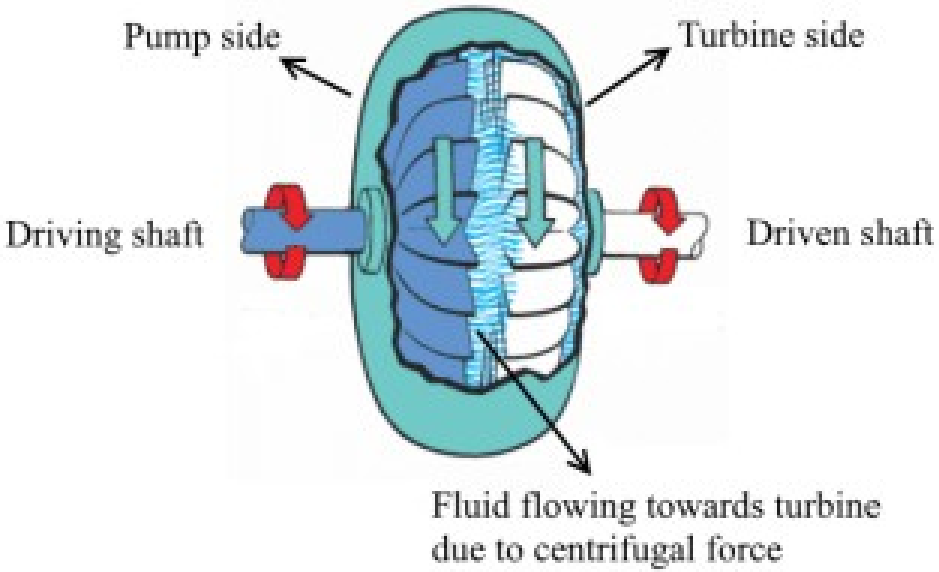
JAW & SPIDER COUPLING

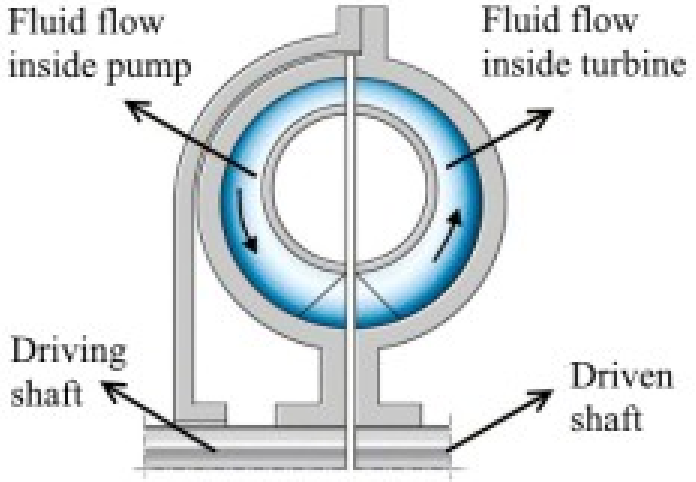
Their application is ideal for transmitting torque while damping torsional vibrations and absorbing shocks produced by the uneven operation of certain prime movers

torsionally flexible and designed for positive torque transmission. They are failsafe. Operational vibrations and shocks are efficiently dampened and reduced

FLUID COUPLING

FLUID COUPLING





FLUID COUPLING

Fluid coupling consists of 2 parts – a pump & a turbine. Both of these have blades mounted inside at a certain angle. The pump is mounted on the end of driver shaft while the turbine on the driven shaft.

The fluid enters into the pump through its centre and when the driver shaft rotates, due to centrifugal force it is pushed outwards. The casing is such that it diverts the motion of fluid into the turbine and the turbine blades along with turbine starts rotating. This way the pump and the turbine both make a coupling.
When an extra part called a reactor is introduced between the pump and the turbine, surprisingly the device becomes a torque converter which is an alternative to manual clutch in automatic transmission systems in cars !

FLUID COUPLING

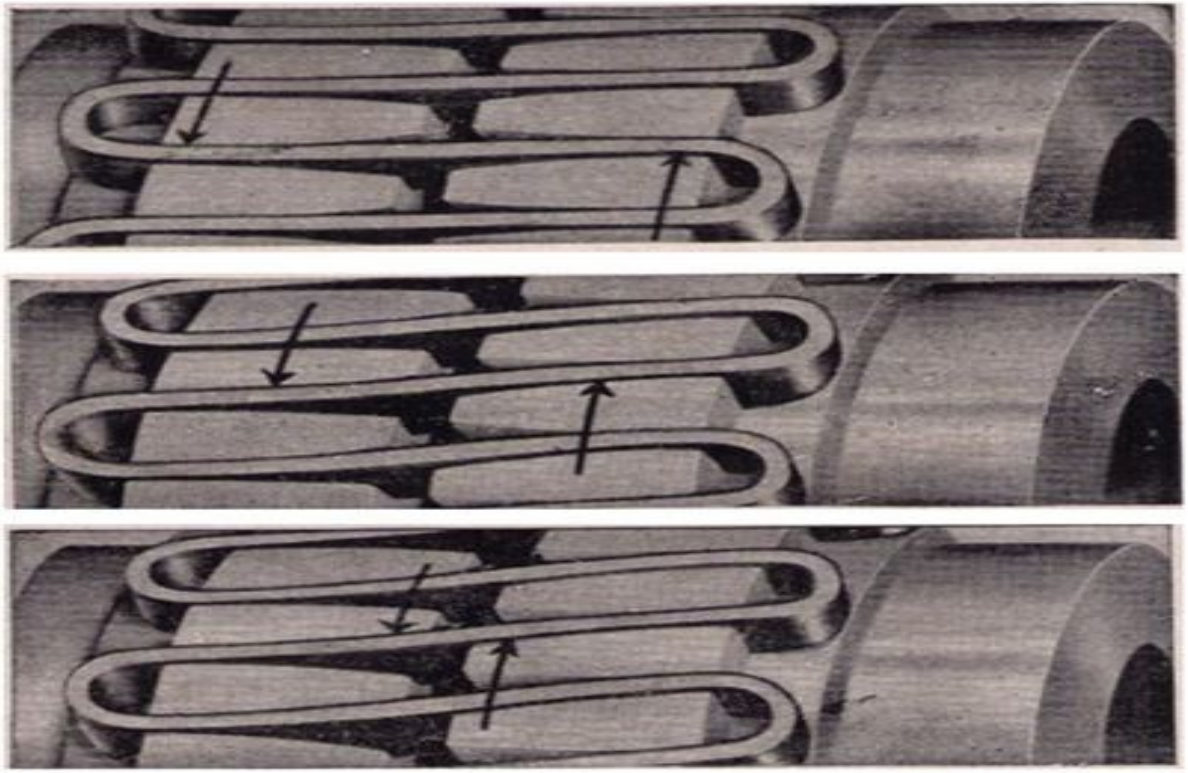
Application-
It is widely used in marine and industrial applications where controlled start-up of the power transmission is very essential.

BELLOWS COUPLING

BELLOWS COUPLING

Bellows couplings are an assembly of two aluminum hubs and a uniform, thin walled stainless steel bellows.
The use of aluminum hubs with a bellows results in a coupling with very low inertia,
The characteristics of bellows make them an ideal method for transmitting torque in motion control applications.
The bellows allow the coupling to bend easily under loads caused by the three basic types of misalignment between shafts (angular, parallel, axial motion).

BIBBY COUPLING



Spring condition under normal load

Spring condition under slight overload

Spring condition under Severe shock load

Working of the Bibby coupling

BIBBY COUPLING

Applications :

Cement Mills – in grinding and crushing machinery.

Cranes

Conveyors

Turbines

Marine Auxiliaries

Paper Mills

COUPLINGS – PARALLEL SHAFT

- Used to join ***PARALLELSHAFTS***
- *Case of eccentricity in Rotating shafts*

OLDHAM's COUPLINGS

- Used to join ***PARALLELSHAFTS***
- *Case of eccentricity in Rotating shafts*

Driving Tongue Driven

OLDHAM's COUPLINGS