

# Types of Gears

A **gear** is a wheel with teeth on its outer circumference connected to an axle. The teeth prevent slipping by engaging on another gear. The gear can be made to change direction, speed, and torque depending on its size, arrangement, and type.



## Worm Drive Gear

Combines a worm screw and worm wheel (spur gear). The worm wheel may have straight or angular teeth. The shafts lie in parallel planes and may be at any angle between 0 to 90°. The worm meshes with and turns the spur gear, but the spur doesn't turn the worm.

**Advantage:** Operates silently  
**Disadvantage:** Low efficiency due to heat production



## Spur Gear

The most common type. Straight teeth are parallel to the axis of the shaft. Used to transmit power. Mounted in a series or parallel to each other.

**Advantage:** Cost effective and highly reliable  
**Disadvantage:** Cannot transfer power in different directions



## Bevel Gear

Two conical wheels that intersect at an angle, usually 90°. Teeth are tapered in both tooth thickness and height. Transmits power from one direction to another. Changes the direction of the shaft's rotation.

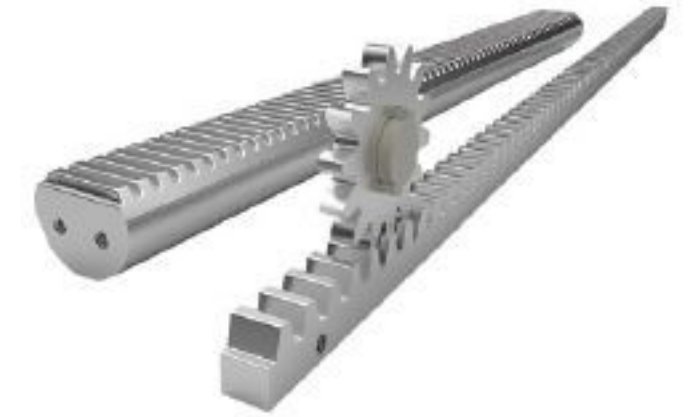
**Advantage:** Able to change the operating angle  
**Disadvantage:** Gears have to be matched to work



## Helical Gear

Teeth are inclined to axis of the shaft (15–50°) in the form of a helix. Used in high-speed applications. The angle twist creates instant contact with gear teeth.

**Advantage:** Transmits motion and power between parallel and right-angled shafts  
**Disadvantage:** Generates heat



## Rack & Pinion Gear

Combines a pinion gear with a rack (a toothed bar or rod). As the pinion turns, the rack moves in a straight line.

**Advantage:** Converts rotational motion to linear motion  
**Disadvantage:** High-friction system



Guitar



Watch



Drill



Pencil sharpener



Cog railway system