

# Spur gear terminology.

# Terminology of gear tooth

## **Addendum circle:**

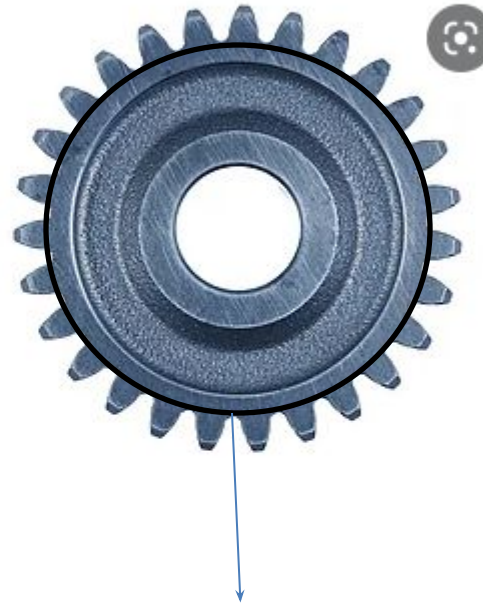
a circle touching the outermost points of the teeth of a circular gear wheel.



**Addendum circle**

## **Dedendum circle :**

the circle touching the bottom of the spaces between the teeth of a gear wheel.



**Dedendum circle**

# Terminology of gear tooth

## Base circle:

the circle of an involute gear wheel from which the involute forming the outline of the tooth face is generated



**Base circle**

Two case possible for base circle radius.

Case 1: Base circle radius is smaller than **Dedendum circle radius.**

Case 2: Base circle radius is larger than **Dedendum circle radius.**

If radius of base circle  $R_b <$  radius of Dedendum circle radius  $R_d$

Then teeth profile is involute.

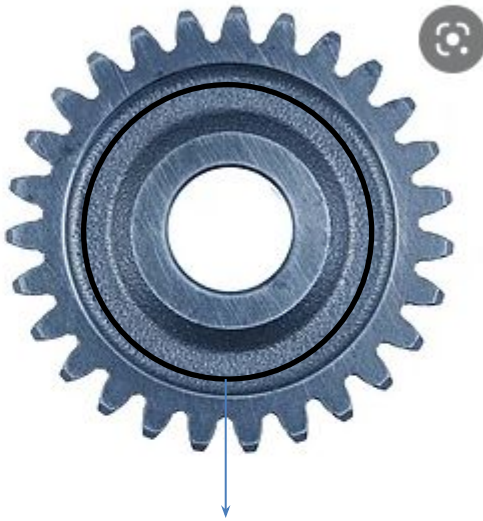
If radius of base circle  $R_b >$  radius of Dedendum circle radius  $R_d$

Then teeth profile is non involute profile below base circle radius.

# Terminology of gear tooth

## Base circle:

the circle of an involute gear wheel from which the involute forming the outline of the tooth face is generated



**Base circle**

Two case possible for base circle radius.

Case 1: Base circle radius is smaller than **Dedendum circle radius.**

Case 2: Base circle radius is larger than **Dedendum circle radius.**

If radius of base circle  $R_b <$  radius of Dedendum circle radius  $R_d$

Then teeth profile is involute.

If radius of base circle  $R_b >$  radius of Dedendum circle radius  $R_d$

Then teeth profile is non involute profile below base circle radius.

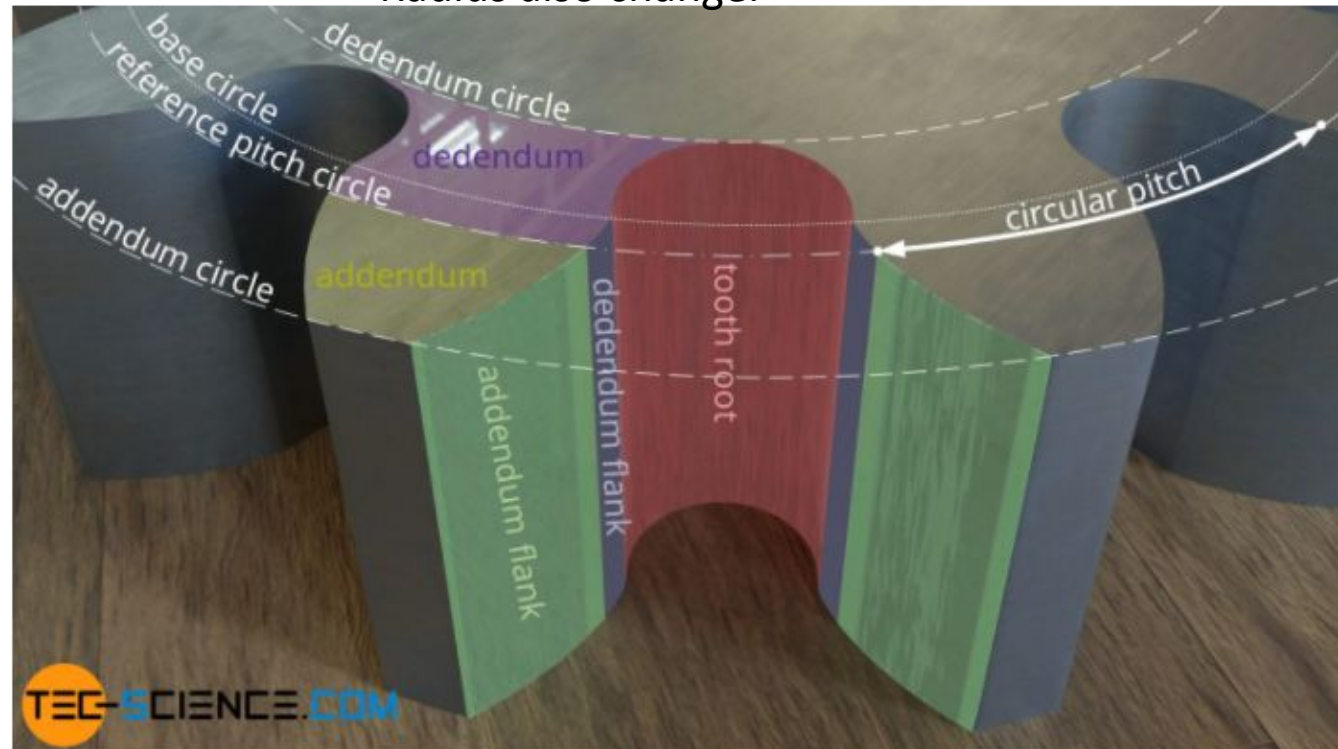
# Terminology of gear tooth

## Circular pitch :

Circular pitch is the distance from a point on one tooth to the corresponding point on the next tooth measured along the pitch circle. Its value is equal to the circumference of the **pitch circle** divided by the number of teeth in the gear.

Pitch circle comes into picture when any two Gear mesh (i.e. in contact). For single gear Pitch circle is meaning less.

Pitch circle also change with centre distance. i.e. if we change centre distance pitch circle Radius also change.



# Two spur gear are in mesh

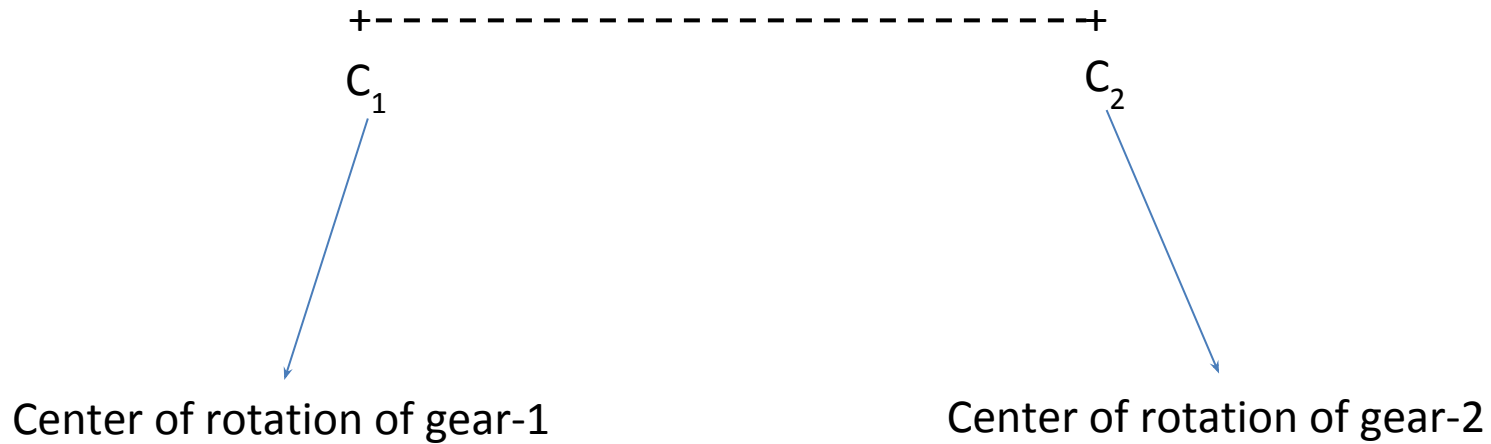
When two spur gear are mesh following terms are come into picture.

1. Pitch circle(pitch circle radius)
2. Pressure angle( $\alpha$ )
3. Path of contact( = path of approach + path of recess)
4. Arc of contact(= arc of approach + arc of recess)
5. Contact ratio

Now start learning one by one term.

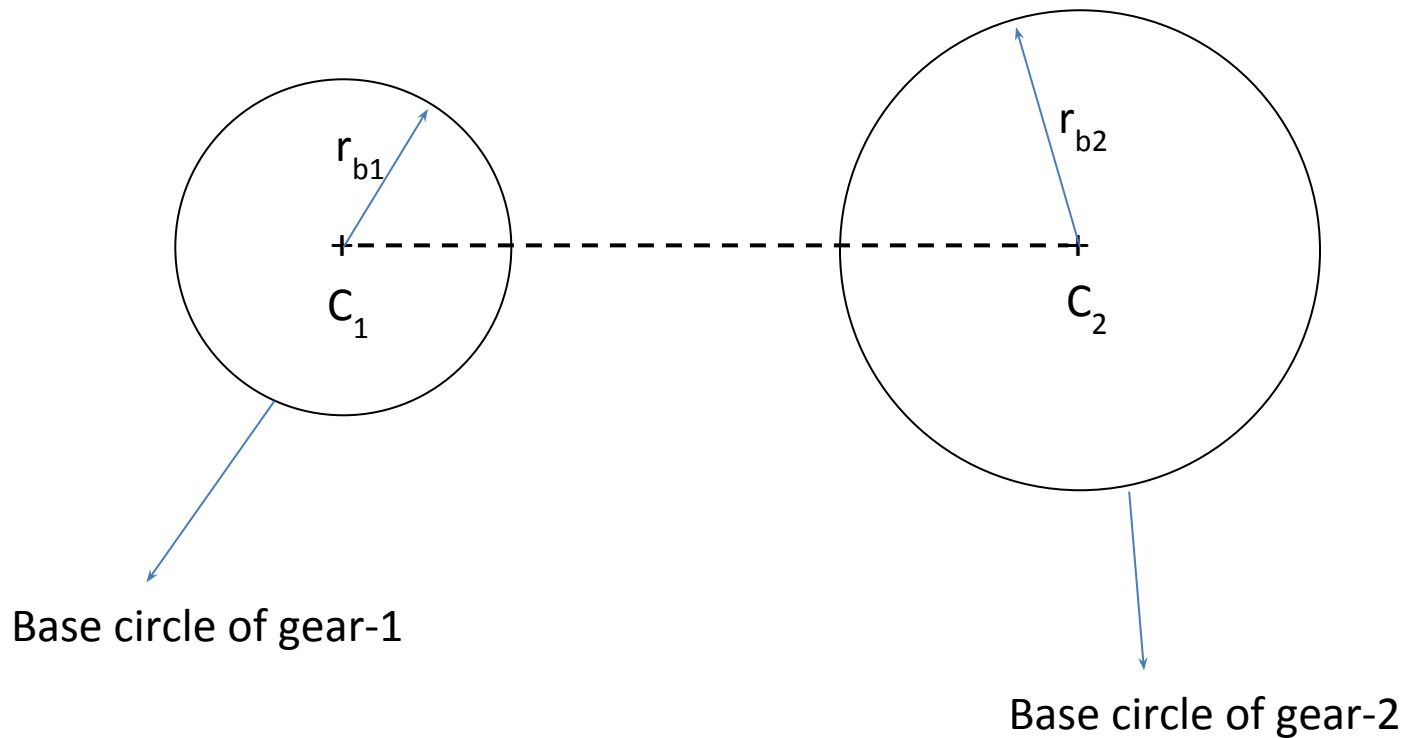
# Two spur gear are in mesh

Suppose two spur gear are in mesh then first we locate the centre of rotation of shaft.



# Two spur gear are in mesh

Now each gear have base circle. So we draw base circle of gear -1 and gear -2. Base circle radius of gear-1 is  $r_{b1}$  (it remains fixed for gear-1). Base circle radius of gear-2 is  $r_{b2}$  (it remains fixed for Gear-2).

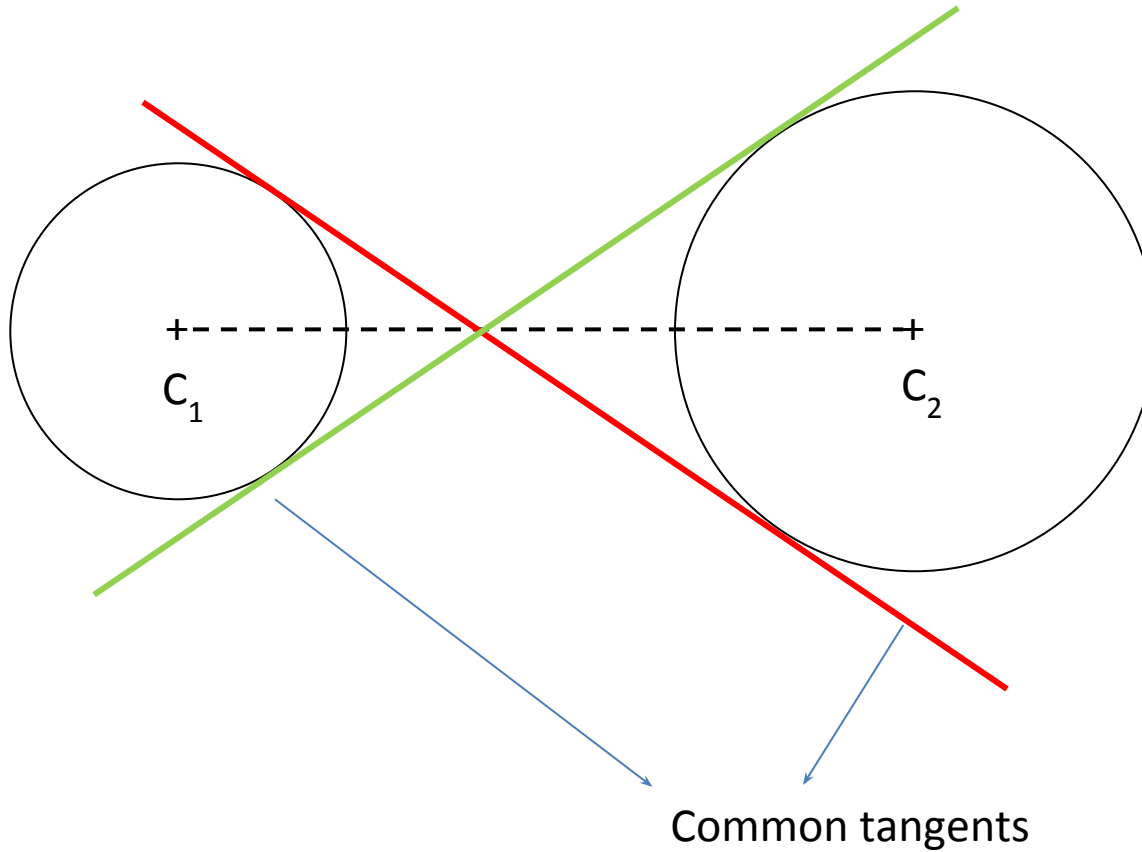




# Two spur gear are in mesh

Draw a common tangent on the base circle (total no of common tangent is 4)

I have draw only two.

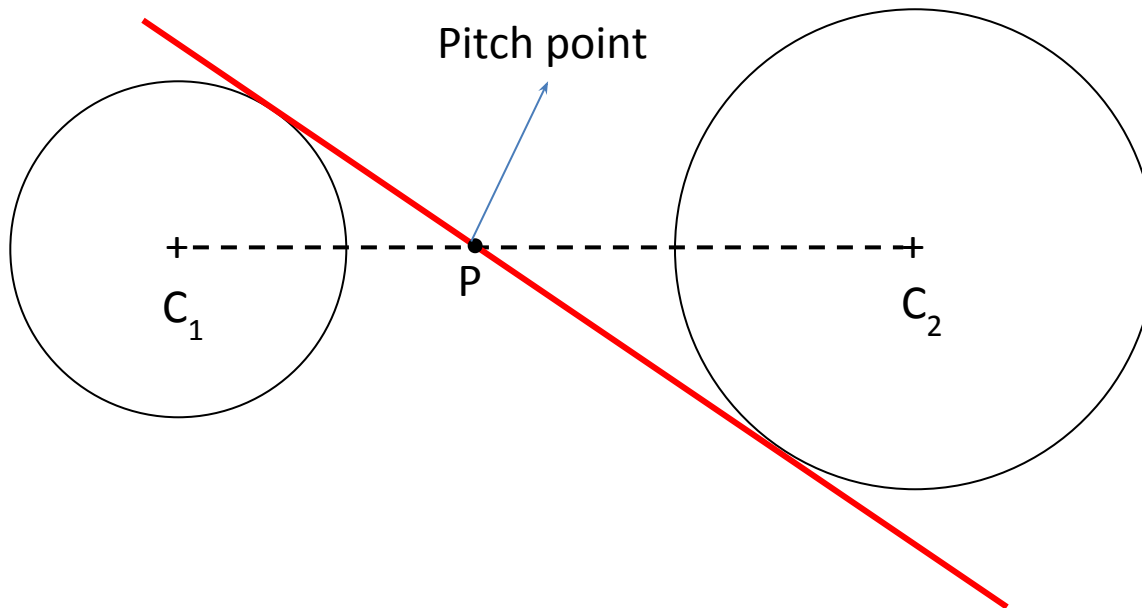


# Two spur gear are in mesh

A new term introduce to us, that we call as **pitch point**. So first we define pitch point.

Pitch point: Intersection of common tangent on base circles of meshing gear and line joining

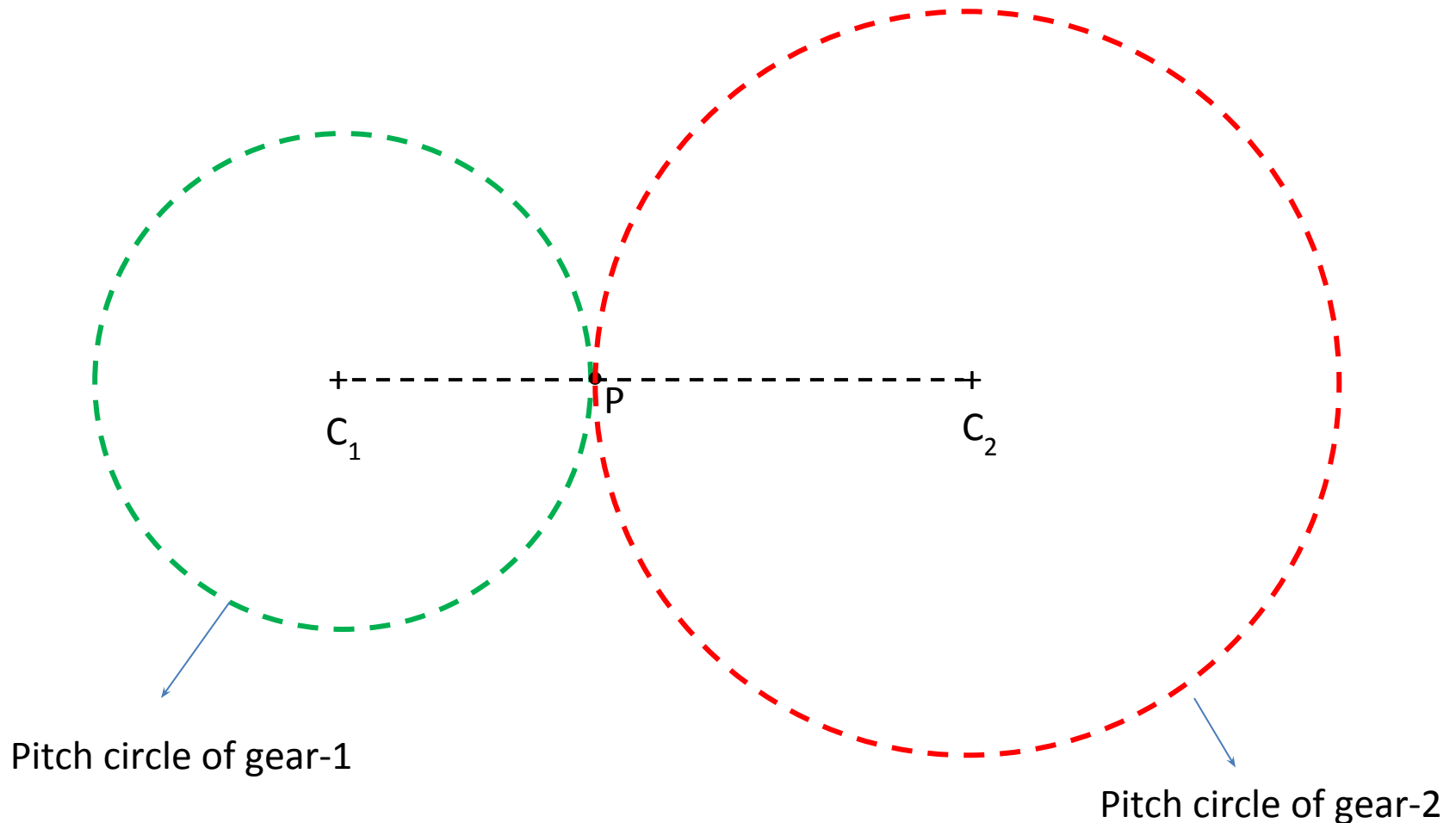
Center of rotation is called as **pitch point**.



# Two spur gear are in mesh

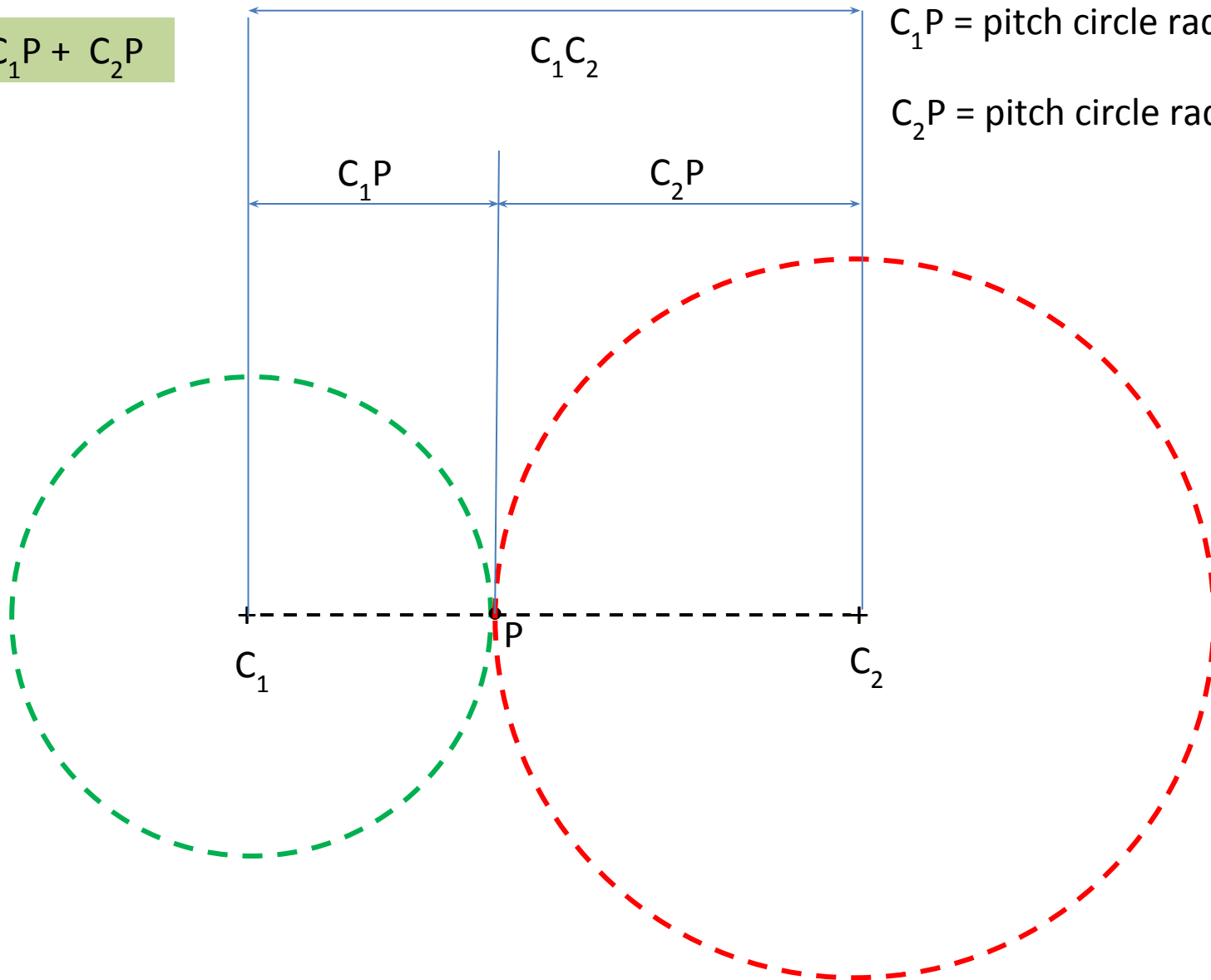
Once you get pitch point P then you can define pitch circle of gear-1 and gear-2.

Pitch circle of gear-1: Draw a circle with center  $C_1$  and radius  $C_1P$ . This circle is known as pitch circle of gear-1 and  $C_1P$  is called as pitch circle radius of gear -1.



# Two spur gear are in mesh

$$C_1C_2 = C_1P + C_2P$$



$C_1P$  = pitch circle radius of gear-1

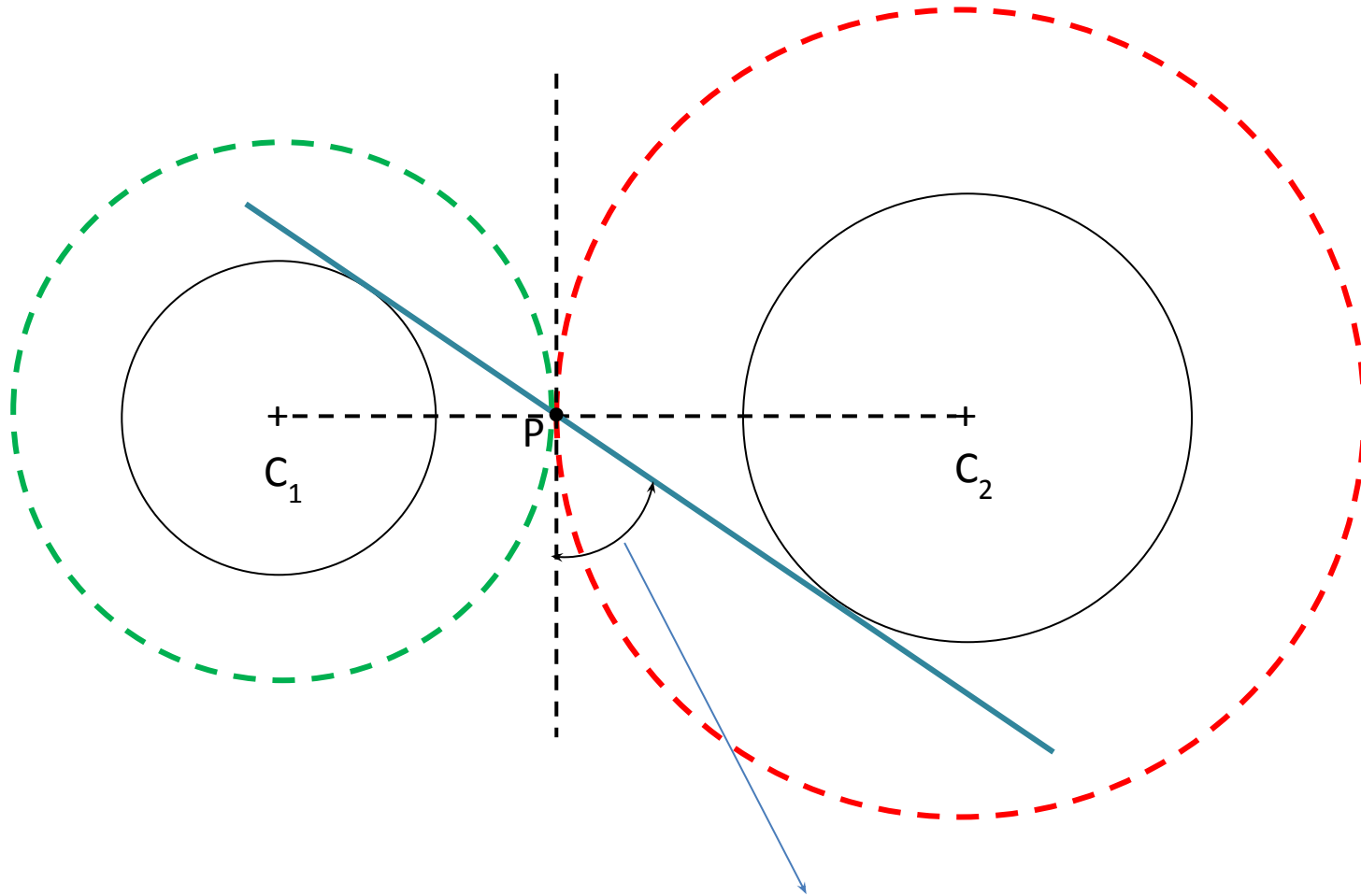
$C_2P$  = pitch circle radius of gear-2

Note: center distance is equal to sum of pitch circle radius of meshing gear.

# Pressure angle

A new term introduced to us is known as pressure angle

Pressure angle: Angle made by common tangent at pitch circle and common tangent on base circles



This angle is known as pressure angle.