Cam Terminology

Base Circle

The smallest circle centered on the cam rotation axis, and tangent to the cam surface. The size of the base circle is dictated by spatial restrictions of the application.

Trace point

On a roller follower, it is the center of the roller.

Home Position

The orientation of the cam that corresponds to 0° on a displacement curve.

Reference Circle (or prime circle):

A circle centered at the cam axis whose radius is equal to the distance to the trace point.

Pressure Angle:

The angle between the direction of motion of the follower and the direction of the cam contact force.

Pressure angle should not exceed 30°.

Radius of Curvature, ρ

$$r_{pitch} = \frac{\left[\left(R_p + s\right)^2 + v^2\right]^{\frac{3}{2}}}{\left(R_p + s\right)^2 + 2v^2 - a\left(R_p + s\right)}$$

This is the radius of curvature for the "pitch curve". The pitch curve radius of curvature is simply the cam's radius of curvature - the roller's radius. Rp is the radius of the prime circle.

Rule of thumb:

Keep the absolute value of the minimum value of radius of curvature of the cam pitch curve at least 2-3 times larger than the radius of the roller follower.