

Important Maximum Velocity of the Follower Formulas PDF



Formulas Examples with Units

List of 11 Important Maximum Velocity of the Follower Formulas

1) Max Velocity of Follower for Tangent Cam with Roller Follower Formula

Formula

Evaluate Formula 

$$V_m = \omega \cdot (r_1 + r_r) \cdot \frac{\sin(\varphi)}{\cos(\varphi)^2}$$

Example with Units

$$80.0915 \text{ m/s} = 27 \text{ rad/s} \cdot (3 \text{ m} + 31 \text{ m}) \cdot \frac{\sin(0.0867 \text{ rad})}{\cos(0.0867 \text{ rad})^2}$$

2) Maximum Velocity of Follower during Outstroke at Uniform Acceleration Formula

Formula

Example with Units

Evaluate Formula 

$$V_m = \frac{2 \cdot S \cdot \omega}{\theta_o}$$

$$80 \text{ m/s} = \frac{2 \cdot 20 \text{ m} \cdot 27 \text{ rad/s}}{13.50 \text{ rad}}$$

3) Maximum Velocity of Follower during Outstroke at Uniform Acceleration given Time of Outstroke Formula

Formula

Example with Units

Evaluate Formula 

$$V_m = \frac{2 \cdot S}{t_o}$$

$$80 \text{ m/s} = \frac{2 \cdot 20 \text{ m}}{0.50 \text{ s}}$$

4) Maximum Velocity of Follower during Outstroke for Cycloidal Motion Formula

Formula

Example with Units

Evaluate Formula 

$$V_m = \frac{2 \cdot \omega \cdot S}{\theta_o}$$

$$80 \text{ m/s} = \frac{2 \cdot 27 \text{ rad/s} \cdot 20 \text{ m}}{13.50 \text{ rad}}$$

5) Maximum Velocity of Follower during Return Stroke at Uniform Acceleration given Time of Stroke Formula

Formula

Example with Units

Evaluate Formula 

$$V_m = \frac{2 \cdot S}{t_R}$$

$$80 \text{ m/s} = \frac{2 \cdot 20 \text{ m}}{0.5 \text{ s}}$$



6) Maximum Velocity of Follower during Return Stroke for Cycloidal Motion Formula

Formula

$$V_m = \frac{2 \cdot \omega \cdot S}{\theta_R}$$

Example with Units

$$80 \text{ m/s} = \frac{2 \cdot 27 \text{ rad/s} \cdot 20 \text{ m}}{13.5 \text{ rad}}$$

Evaluate Formula 

7) Maximum Velocity of Follower during Return Stroke for Uniform Acceleration Formula

Formula

$$V_m = \frac{2 \cdot S \cdot \omega}{\theta_R}$$

Example with Units

$$80 \text{ m/s} = \frac{2 \cdot 20 \text{ m} \cdot 27 \text{ rad/s}}{13.5 \text{ rad}}$$

Evaluate Formula 

8) Maximum Velocity of Follower for Circular Arc Cam Contacting with Circular Flank Formula

Formula

$$V_m = \omega \cdot (R - r_1) \cdot \sin(2\alpha)$$

Example with Units

$$80.0866 \text{ m/s} = 27 \text{ rad/s} \cdot (5.97 \text{ m} - 3 \text{ m}) \cdot \sin(1.52 \text{ rad})$$

Evaluate Formula 

9) Maximum Velocity of Follower on Outstroke given Time Stroke Formula

Formula

$$V_m = \frac{\pi \cdot S}{2 \cdot t_o}$$

Example with Units

$$62.8319 \text{ m/s} = \frac{3.1416 \cdot 20 \text{ m}}{2 \cdot 0.50 \text{ s}}$$

Evaluate Formula 

10) Maximum Velocity of Follower on Outstroke when Follower Moves with SHM Formula

Formula

$$V_m = \frac{\pi \cdot S \cdot \omega}{2 \cdot \theta_o}$$

Example with Units

$$62.8319 \text{ m/s} = \frac{3.1416 \cdot 20 \text{ m} \cdot 27 \text{ rad/s}}{2 \cdot 13.50 \text{ rad}}$$

Evaluate Formula 

11) Maximum Velocity of Follower on Return Stroke when Follower Moves with SHM Formula

Formula

$$V_m = \frac{\pi \cdot S \cdot \omega}{2 \cdot \theta_R}$$

Example with Units

$$62.8319 \text{ m/s} = \frac{3.1416 \cdot 20 \text{ m} \cdot 27 \text{ rad/s}}{2 \cdot 13.5 \text{ rad}}$$

Evaluate Formula 



Variables used in list of Maximum Velocity of the Follower Formulas above

- 2α Total Angle of Action of Cam (Radian)
- R Radius of Circular Flank (Meter)
- r_1 Radius of The Base Circle (Meter)
- r_r Radius of Roller (Meter)
- S Stroke of Follower (Meter)
- t_o Time Required For The Outstroke (Second)
- t_R Time Required For The Return Stroke (Second)
- V_m Maximum Velocity of Follower (Meter per Second)
- θ_o Angular Displacement of Cam During Out Stroke (Radian)
- θ_R Angular Displacement of Cam During Return Stroke (Radian)
- ϕ Angle Turned By The Cam For Contact of Roller (Radian)
- ω Angular Velocity of Cam (Radian per Second)

Constants, Functions, Measurements used in list of Maximum Velocity of the Follower Formulas above

- **constant(s):** pi, 3.14159265358979323846264338327950288
Archimedes' constant
- **Functions:** cos, cos(Angle)
Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- **Functions:** sin, sin(Angle)
Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- **Measurement:** Length in Meter (m)
Length Unit Conversion 
- **Measurement:** Time in Second (s)
Time Unit Conversion 
- **Measurement:** Speed in Meter per Second (m/s)
Speed Unit Conversion 
- **Measurement:** Angle in Radian (rad)
Angle Unit Conversion 
- **Measurement:** Angular Velocity in Radian per Second (rad/s)
Angular Velocity Unit Conversion 



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