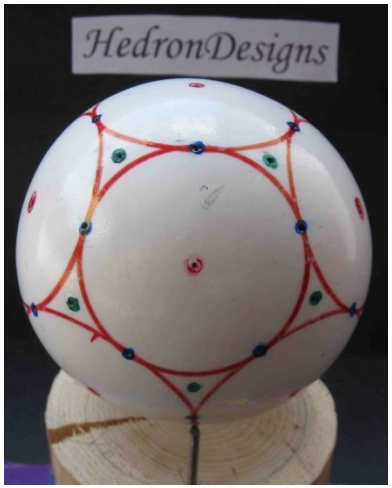
Polyconix Models

$5F^{2e}$

Icosaconix

$5V^{3e}$

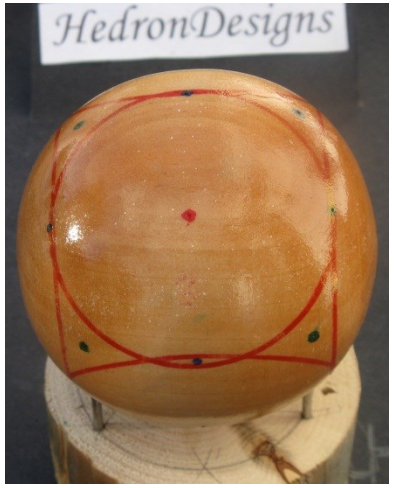


Dodecaconix

$4F^{2e}$

Octaconix

$4V^{2e}$



Hexaconix

$3V^{1e}$

Tetraconix

Geometric Model

with subtended angle Θ

Ω **Top conical angle**

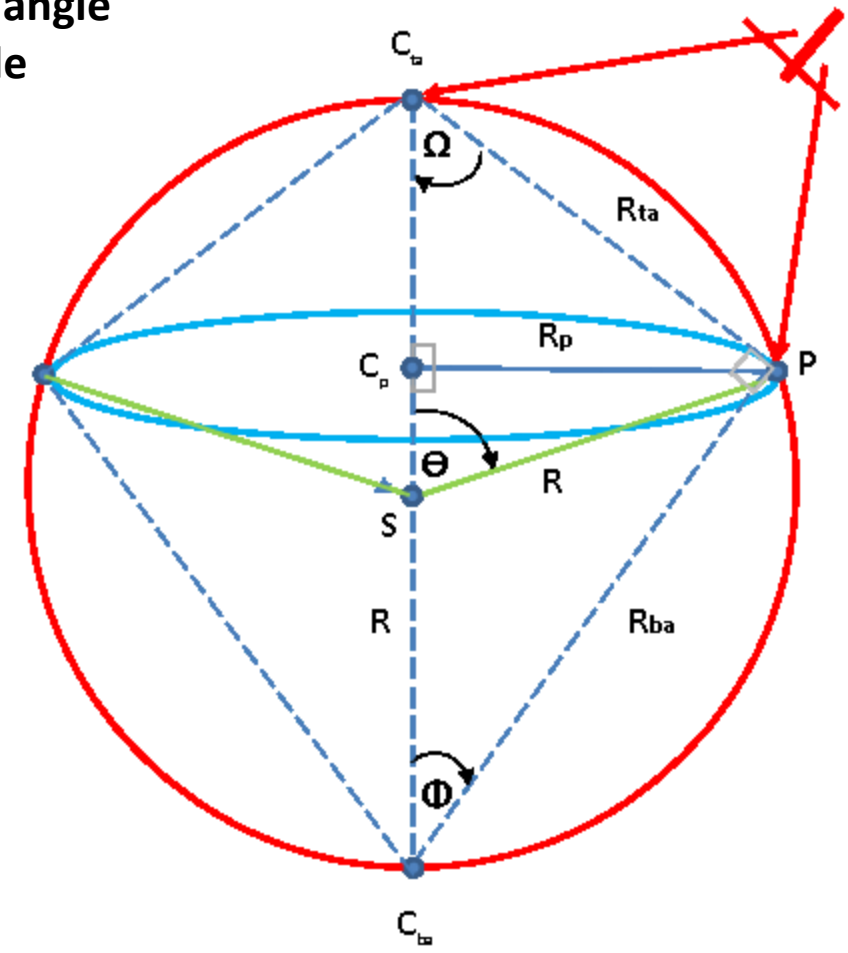
Φ **Bottom conical angle**

Θ **Subtended angle**

$\Omega + \Phi = \pi/2$

$\Theta + 2\Omega = \pi$

$\Theta = 2\Phi$

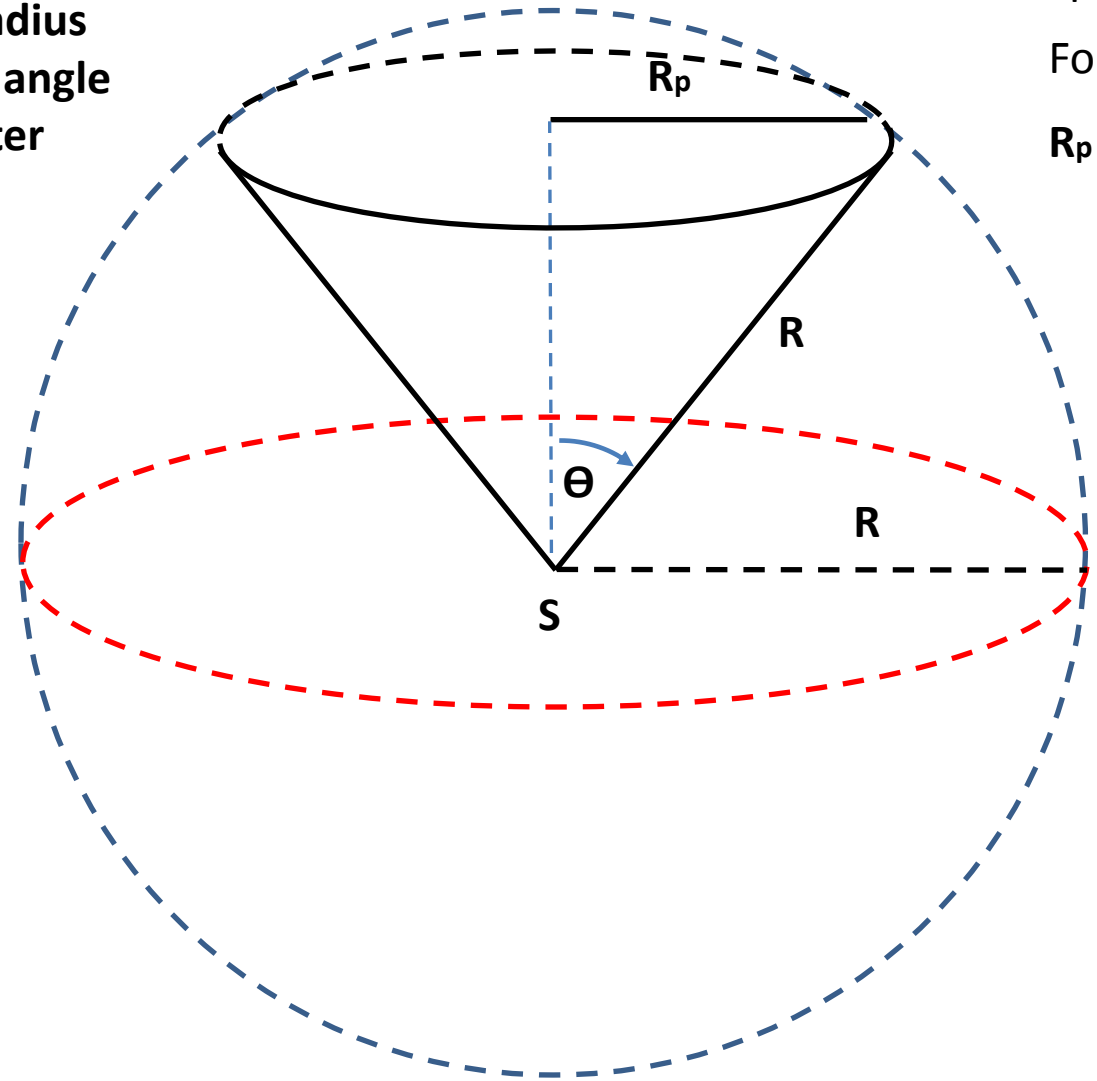


R_p = Planar radius
R = Spherical radius
Θ = Subtended angle
S = Sphere center

$R_p = R\sin\theta$

For unit sphere:

$R_p = \sin\theta$

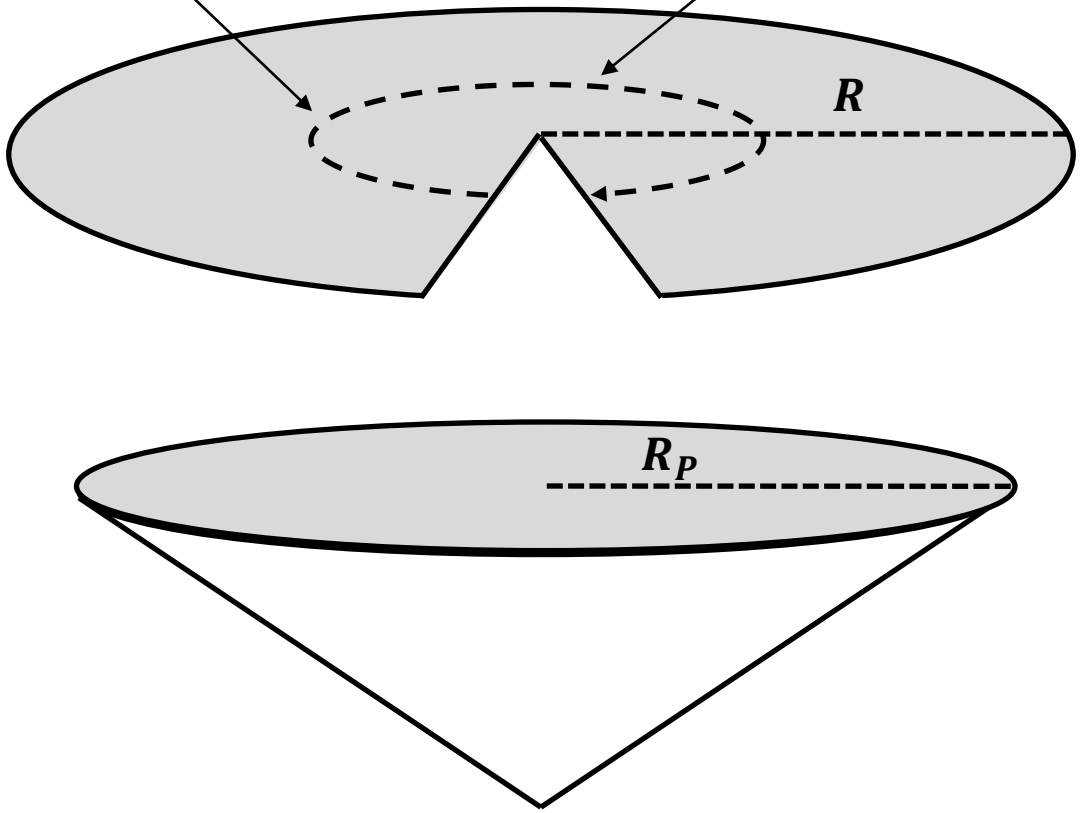


Conical Wedge (CW) for Polyconix

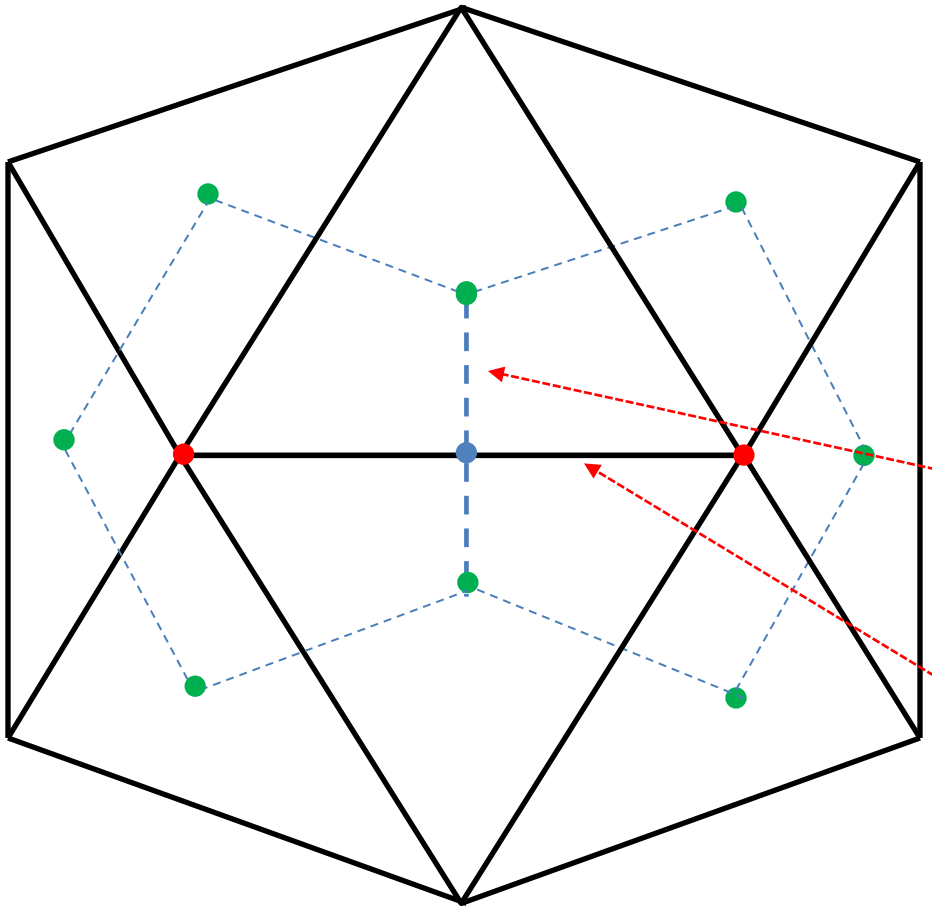
$$\mathbf{CW} = \frac{\boldsymbol{R_P}}{\boldsymbol{R}} * \mathbf{360°}$$

For unit sphere:

$$\mathbf{CW} = \sin\boldsymbol{\theta} * \mathbf{360°}$$



Icosaconix/Dodecaconix – Subtending Angles (Θ)



- (V) Vertex of icosahedron
- (F) Face of icosahedron
- (E) Edge of icosahedron

Subtended angle Θ of icosaconix

(between axis F and E)

$5F^{2e}(\Theta)$

Subtended angle Θ of dodecaconix

(between axis V and E)

$5V^{3e}(\Theta)$

Conical Wedge (CW) calculation
Icosaconix

$5F^{2e}(\Theta)$ = Half edge of Dodecadesic = 41.81°/2 = 20.905°

CW of $5F^{2e}$ = $\sin(\Theta)$ * 360°

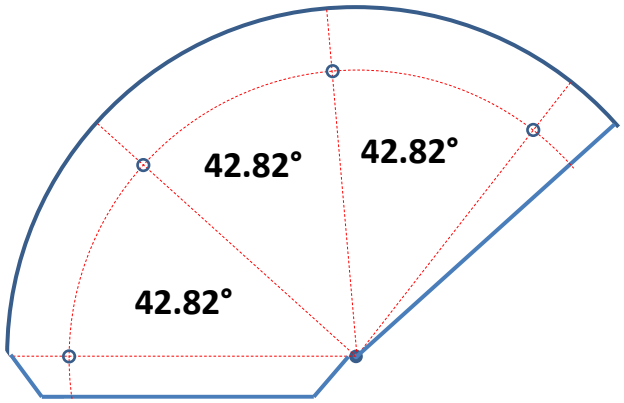
CW of $5F^{2e}$ = $\sin(20.905°)$ * 360°

CW of $5F^{2e}$ = 128.456°

3 abutments @(42.82°)

20 cones in Icosaconix

Icosaconix Conical Wedge template



Conical Wedge CW = 128.456°

3 abutments @(42.82°)

Conical Wedge (CW) calculation
Dodecaconix

$5V^{3e}(\Theta)$ = Half edge of Icosadesic = 63.435°/2 = 31.7175°

CW of $5V^{3e}$ = $\sin(\Theta)$ * 360°

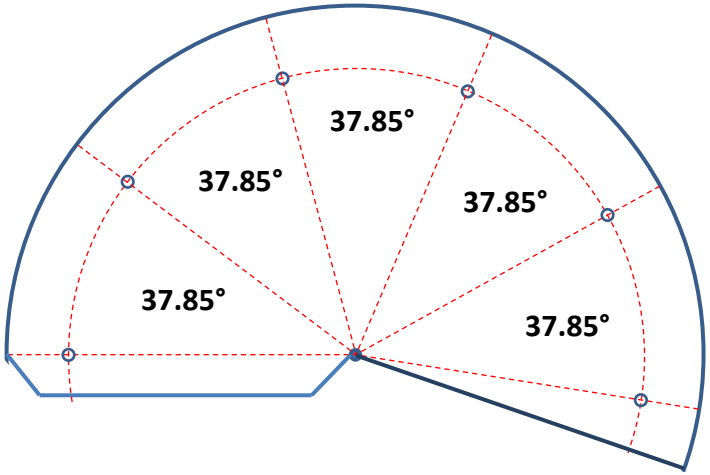
CW of $5V^{3e}$ = $\sin(31.7175°)$ * 360°

CW of $5V^{3e}$ = 189.263°

5 abutments @(37.85°)

12 cones in Dodecaconix

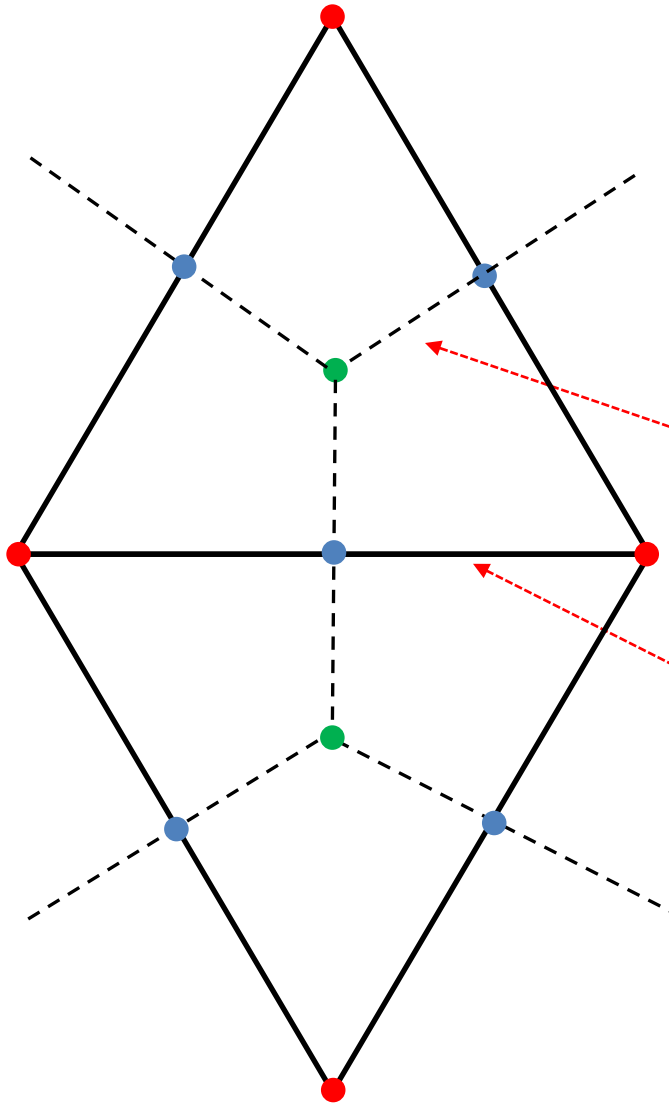
Dodecaconix Conical Wedge template



Conical Wedge CW = 189.263°

5 abutments @(37.85°)

Octaconix/Hexaconix – Subtending Angles (Θ)



- (V) Vertex of octahedron
- (F) Face of octahedron
- (E) Edge of octahedron

Subtended angle Θ of octahedron

(between axis F and E)

$4F^{2e}(\Theta)$

Subtended angle Θ of hexaconix

(between axis V and E)

$4V^{3e}(\Theta)$

Conical Wedge (CW) calculation
Hexaconix

$4V^{2e}(\Theta)$ = Half edge of Octadesic = 90°/2 = 45°

CW of $4V^{2e}$ = $\sin(\Theta)$ * 360°

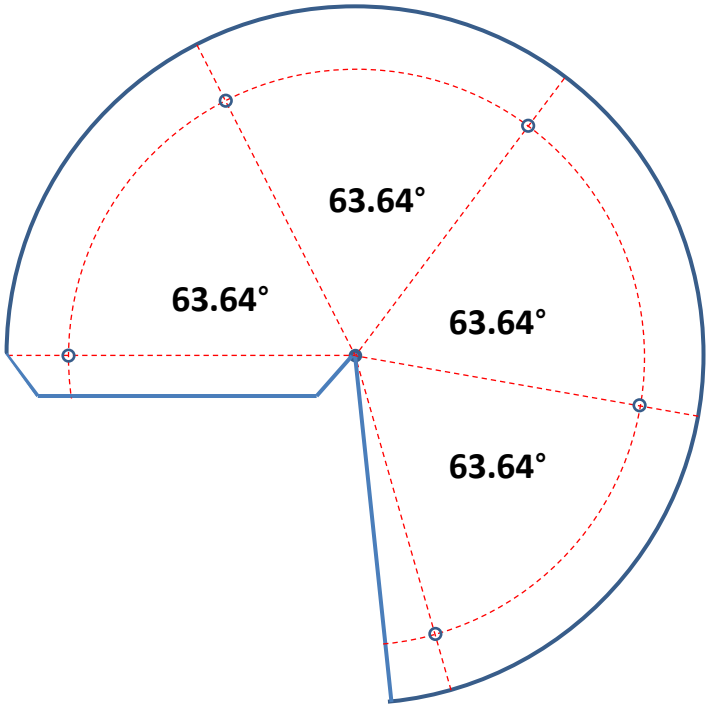
CW of $4V^{2e}$ = $\sin(45°)$ * 360°

CW of $4V^{2e}$ = 254.56°

4 abutments @(63.64°)

6 cones in Hexaconix

Hexaconix Conical Wedge template



Conical Wedge CW = 254.56°

4 abutments @(63.64°)

Conical Wedge (CW) calculation
Octaconix

$4F^{2e}(\Theta)$ = Half edge of Hexadesic = 70.528°/2 = 35.264°

CW of $4F^{2e}$ = $\sin(\Theta)$ * 360°

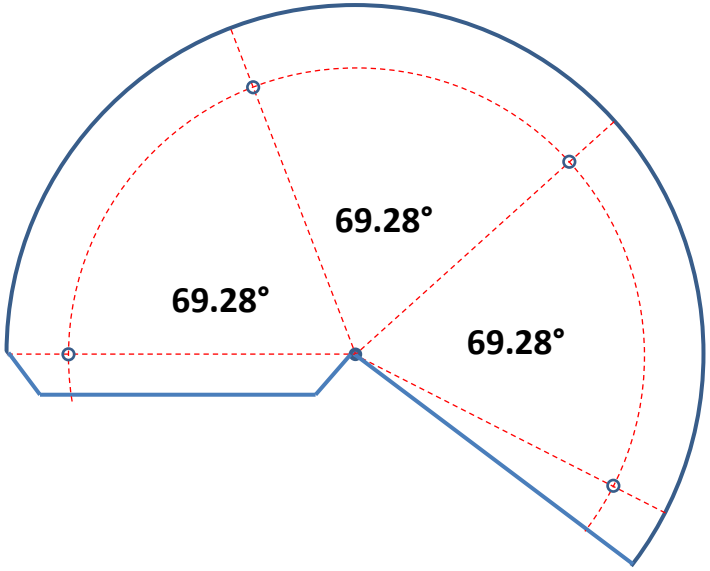
CW of $4F^{2e}$ = $\sin(35.264°)$ * 360°

CW of $4F^{2e}$ = 207.846°

3 abutments @(69.28°)

8 cones in Octaconix

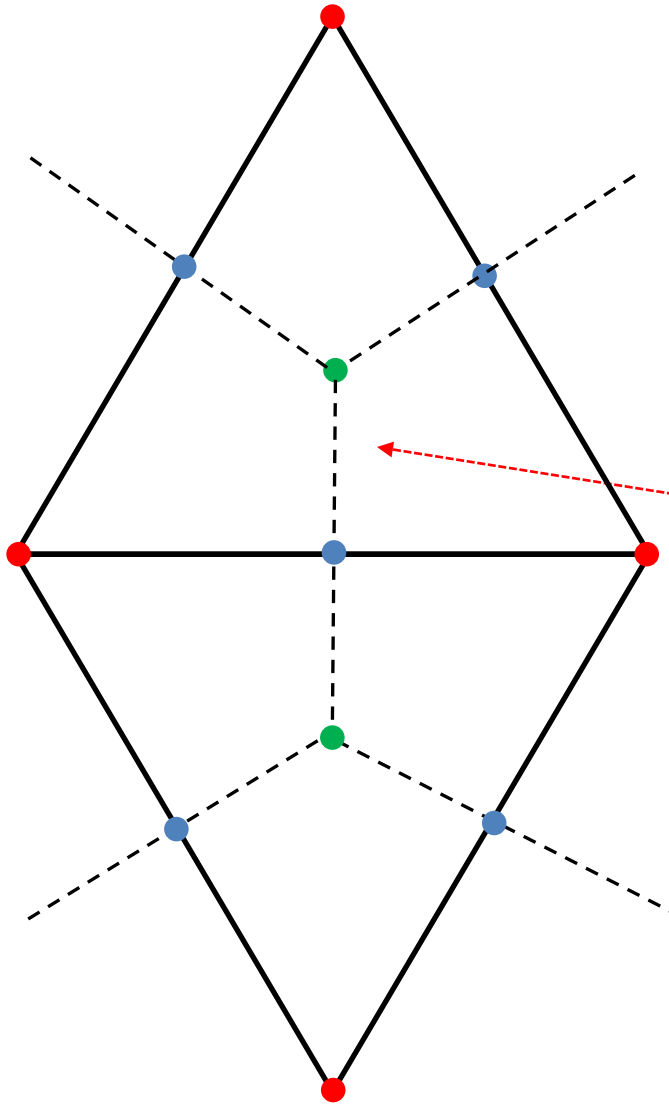
Octaconix Conical Wedge template



Conical Wedge CW = 207.846°

3 abutments @(69.28°)

Tetraconix – Subtending Angles (Θ)



- (V) Vertex of tetrahedron
- (F) Face of tetrahedron
- (E) Edge of tetrahedron

Subtended angle Θ of tetrahedron

(between axis V/F and E)

$3V^{1e}(\Theta)$

Conical Wedge (CW) calculation
Tetraconix

$3V^{1e}(\Theta)$ = Half edge of Tetradesic = 109.4712°/2 = 54.7356°

CW of $3V^{1e}$ = $\sin(\Theta)$ * 360°

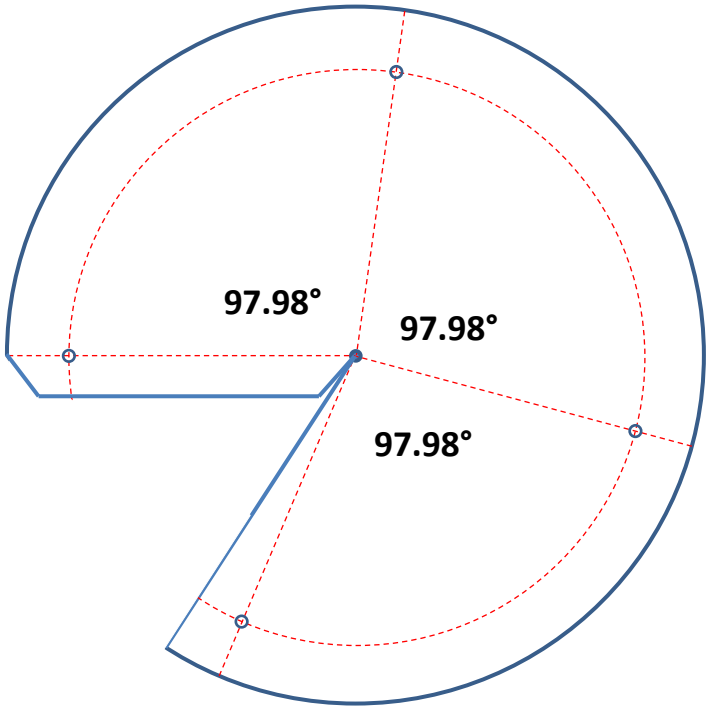
CW of $3V^{1e}$ = $\sin(54.7356°)$ * 360°

CW of $3V^{1e}$ = 293.939°

3 abutments @(97.98°)

4 cones in Tetraconix

Tetraconix Conical Wedge template



Conical Wedge CW = 293.939°

3 abutments @(97.98°)