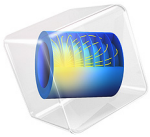


High Voltage Insulator

For a description of this application, including detailed step-by-step instructions showing how to build it, see the book *Introduction to AC/DC Module*. The modeling instructions for the geometry is given in the appendix.

Application Library path: `ACDC_Module/Devices,_Capacitive/high_voltage_insulator`

From the **File** menu, choose **New**.

NEW

In the **New** window, click **Model Wizard**.

MODEL WIZARD

1 In the **Model Wizard** window, click **2D Axisymmetric**.

2 Click **Done**.

GEOMETRY 1

1 In the **Model Builder** window, under **Component 1 (comp1)** click **Geometry 1**.

2 In the **Settings** window for **Geometry**, locate the **Units** section.

3 From the **Length unit** list, choose **mm**.

Use the following instructions to construct the model geometry. First, create the metal fitting at the line end.

Rectangle 1 (r1)

1 In the **Geometry** toolbar, click **Rectangle**.

2 In the **Settings** window for **Rectangle**, locate the **Size and Shape** section.

3 In the **Width** text field, type 12.

4 In the **Height** text field, type 100.

5 Click **Build Selected**.

Second, create the core rod.

Rectangle 2 (r2)

1 In the **Geometry** toolbar, click **Rectangle**.

2 In the **Settings** window for **Rectangle**, locate the **Size and Shape** section.

3 In the **Width** text field, type 6.

4 In the **Height** text field, type 1050.

5 Locate the **Position** section. In the **z** text field, type 50.

6 Click **Build Selected**.

Rectangle 3 (r3)

1 In the **Geometry** toolbar, click **Rectangle**.

2 In the **Settings** window for **Rectangle**, locate the **Size and Shape** section.

3 In the **Height** text field, type 100.

4 In the **Width** text field, type 12.

5 Locate the **Position** section. In the **z** text field, type 1050.

Next, create the weather shed.

Polygon 1 (pol1)

1 In the **Geometry** toolbar, click **Polygon**.

2 In the **Settings** window for **Polygon**, locate the **Object Type** section.

3 From the **Type** list, choose **Open curve**.

4 Locate the **Coordinates** section. In the table, enter the following settings:

r (mm)	z (mm)
12	100
12	150
60	150
20	153

Quadratic Bézier 1 (qb1)

1 In the **Geometry** toolbar, click **More Primitives** and choose **Quadratic Bézier**.

2 In the **Settings** window for **Quadratic Bézier**, locate the **Control Points** section.

3 In row **1**, set **r** to 20.

4 In row **1**, set **z** to 153.

5 In row **2**, set **r** to 13.

6 In row **2**, set **z** to 154.

7 In row **3**, set **r** to 12.

8 In row **3**, set **z** to 161.

9 Locate the **Weights** section. In the **2** text field, type 1.

Polygon 2 (pol2)

1 In the **Geometry** toolbar, click **Polygon**.

2 In the **Settings** window for **Polygon**, locate the **Object Type** section.

3 From the **Type** list, choose **Open curve**.

4 Locate the **Coordinates** section. In the table, enter the following settings:

r (mm)	z (mm)
12	161
12	200
60	200
20	203

Quadratic Bézier 2 (qb2)

1 In the **Geometry** toolbar, click **More Primitives** and choose **Quadratic Bézier**.

2 In the **Settings** window for **Quadratic Bézier**, locate the **Control Points** section.

3 In row **1**, set **r** to 20.

4 In row **1**, set **z** to 203.

5 In row **2**, set **r** to 13.

6 In row **2**, set **z** to 204.

7 In row **3**, set **r** to 12.

8 In row **3**, set **z** to 211.

9 Locate the **Weights** section. In the **2** text field, type 1.

Polygon 3 (pol3)

1 In the **Geometry** toolbar, click **Polygon**.

2 In the **Settings** window for **Polygon**, locate the **Object Type** section.

3 From the **Type** list, choose **Open curve**.

4 Locate the **Coordinates** section. In the table, enter the following settings:

r (mm)	z (mm)
12	211
12	250
80	250
20	253

Quadratic Bézier 3 (qb3)

1 In the **Geometry** toolbar, click **More Primitives** and choose **Quadratic Bézier**.

2 In the **Settings** window for **Quadratic Bézier**, locate the **Control Points** section.

3 In row **1**, set **r** to 20.

4 In row **1**, set **z** to 253.

5 In row **2**, set **r** to 13.

6 In row **2**, set **z** to 254.

7 In row **3**, set **r** to 12.

8 In row **3**, set **z** to 261.

9 Locate the **Weights** section. In the **2** text field, type 1.

10 Click **Build Selected**.

Polygon 1 (pol1), Polygon 2 (pol2), Polygon 3 (pol3), Quadratic Bézier 1 (qb1), Quadratic Bézier 2 (qb2), Quadratic Bézier 3 (qb3)

1 In the **Model Builder** window, under **Component 1 (comp1)>Geometry 1**, Ctrl-click to select **Polygon 1 (pol1)**, **Quadratic Bézier 1 (qb1)**, **Polygon 2 (pol2)**, **Quadratic Bézier 2 (qb2)**, **Polygon 3 (pol3)**, and **Quadratic Bézier 3 (qb3)**.

2 Right-click and choose **Composite Curves**.

Array 1 (arr1)

1 In the **Geometry** toolbar, click **Transforms** and choose **Array**.

2 Select the object **cc1** only.

3 In the **Settings** window for **Array**, locate the **Size** section.

4 From the **Array type** list, choose **Linear**.

5 In the **Size** text field, type 5.

6 Locate the **Displacement** section. In the **z** text field, type 161.

7 Click **Build Selected**.

Composite Curve 1 (cc1)

In the **Model Builder** window, right-click **Composite Curve 1 (cc1)** and choose **Duplicate**.

Move 1 (mov1)

1 In the **Geometry** toolbar, click **Transforms** and choose **Move**.

2 Select the object **cc2** only.

3 In the **Settings** window for **Move**, locate the **Displacement** section.

4 In the **z** text field, type 794.

5 Click **Build Selected**.

Polygon 1 (pol1)

1 In the **Model Builder** window, expand the **Component 1 (comp1)>Geometry 1> Composite Curve 2 (cc2)** node, then click **Polygon 1 (pol1)**.

2 In the **Settings** window for **Polygon**, locate the **Coordinates** section.

3 In the table, enter the following settings:

r (mm)	z (mm)
12	111

Polygon 3 (pol3)

1 In the **Model Builder** window, click **Polygon 3 (pol3)**.

2 In the **Settings** window for **Polygon**, locate the **Coordinates** section.

3 In the table, enter the following settings:

r (mm)	z (mm)
12	256
6	256
6	-694
12	-694

Quadratic Bézier 3 (qb3)

In the **Model Builder** window, right-click **Quadratic Bézier 3 (qb3)** and choose **Delete**.

Move 1 (mov1)

1 In the **Model Builder** window, under **Component 1 (comp1)>Geometry 1** click **Move 1 (mov1)**.

2 In the **Settings** window for **Move**, click **Build Selected**.

Convert to Solid 1 (csol1)

1 In the **Geometry** toolbar, click **Conversions** and choose **Convert to Solid**.

2 Select the objects **arr1(1)**, **arr1(2)**, **arr1(3)**, **arr1(4)**, **arr1(5)**, and **mov1** only.

3 In the **Settings** window for **Convert to Solid**, click **Build Selected**.

Fillet 1 (fil1)

1 In the **Geometry** toolbar, click **Fillet**.

2 On the object **r1**, select Point 2 only.

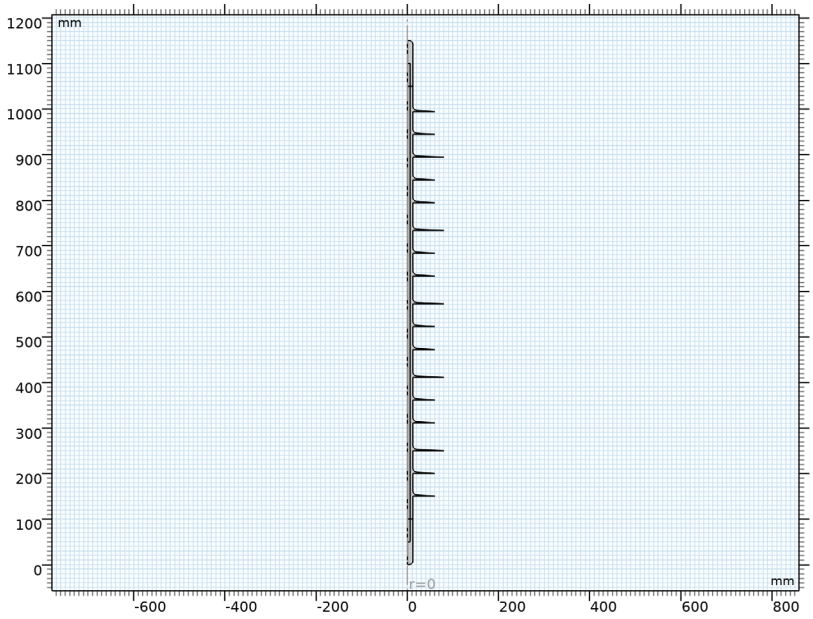
3 On the object **r3**, select Point 3 only.

4 In the **Settings** window for **Fillet**, locate the **Radius** section.

5 In the **Radius** text field, type 8.

6 Click **Build All Objects**.

7 Click the **Zoom Extents** button in the **Graphics** toolbar.



Next, add the computation domain.

Circle 1 (c1)

1 In the **Geometry** toolbar, click **Circle**.

2 In the **Settings** window for **Circle**, locate the **Size and Shape** section.

3 In the **Radius** text field, type `2[m]`.

4 Locate the **Position** section. In the **z** text field, type `500`.

5 Locate the **Size and Shape** section. In the **Sector angle** text field, type `180`.

6 Locate the **Rotation Angle** section. In the **Rotation** text field, type `-90`.

7 Click **Build All Objects**.

8 Click the **Zoom Extents** button in the **Graphics** toolbar.