



Basic Electrodes

CimatronE 8.5 **Tutorial**

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Electrodes

Attachment

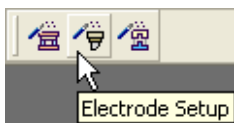
Electrodes Introduction

Welcome to the Cimatron E Electrodes Tutorial. In this tutorial, electrodes will be created using Cimatron's easy to follow Electrode Guide.

Attachment

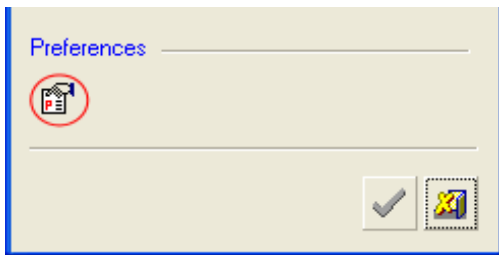
Wizard

Click on the [Electrode Setup](#) icon.

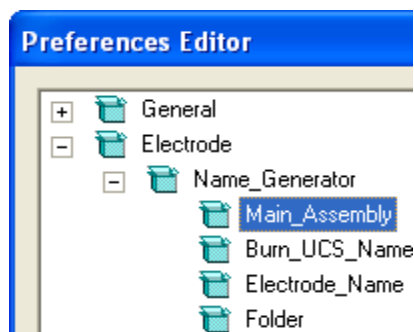


The Electrode Set Up Wizard now appears.

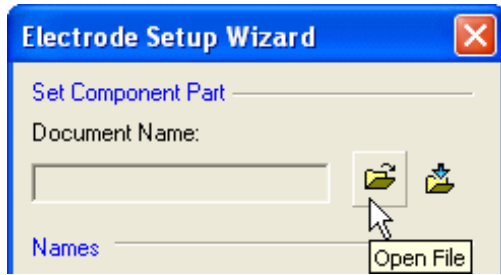
Lightbulb icon: Electrode Preferences can be set at this stage, by using the [Preferences](#) button, before entering the application.



Lightbulb icon: Within the below wizard, the [preferences](#) shown here were set.



☞ Click on the Open File icon.



☞ Select the **Cavity.elt** (located in the \\Tutorial Work Files\Data To Steel directory) from the Cimatron E Explorer.


The Assembly Name now appears in the wizard:





☞ Select **OK**.

Extract 1

An assembly containing the cavity part now appears in the electrodes application.

 A new assembly document has been created.

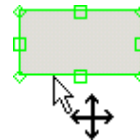
 Select Extract Electrode from the Electrode Guide on the right hand side of the screen, to create a new electrode.

 Click inside the smaller rectangle.

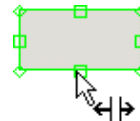
The rectangle can be edited in several ways:

Dynamically, by numeric values and by Reference Line.

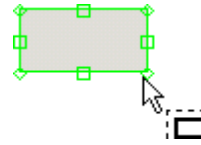
1. By moving the mouse over an edge.



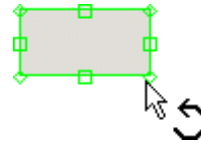
2. By moving the mouse over a mid point.



3. By moving the mouse over a corner.



4. By pressing SHIFT and moving over a corner.

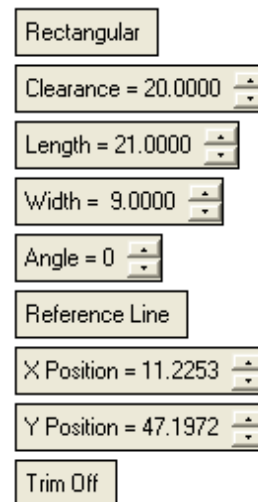
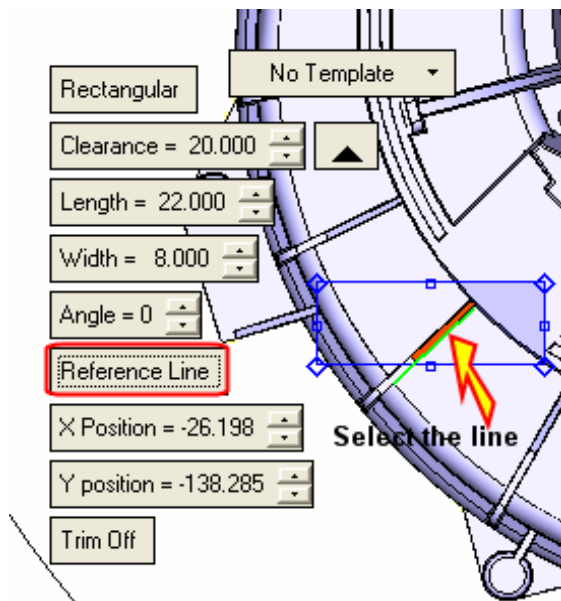


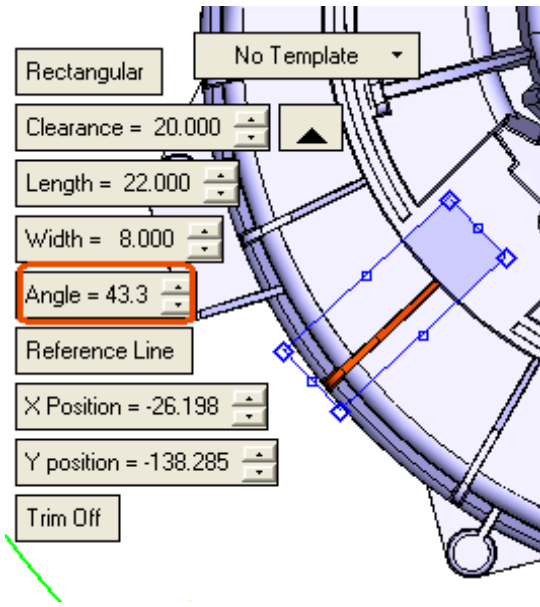
5. By clicking on the expansion arrow.



The values opposite are displayed ONLY for demonstration purposes.

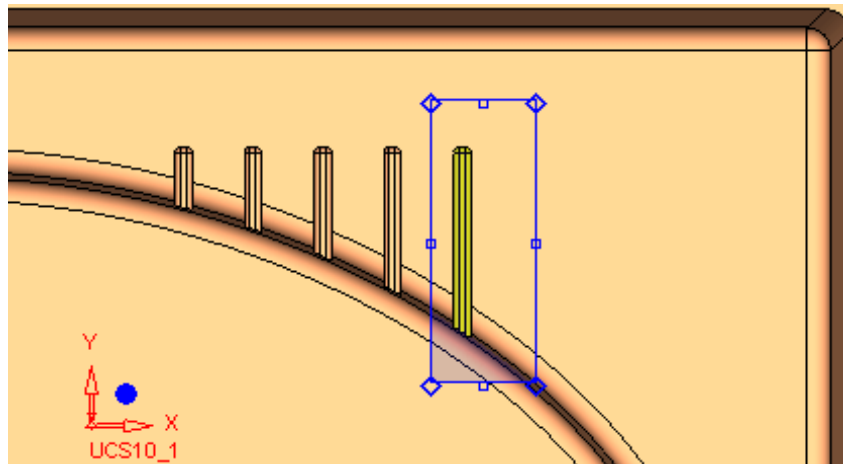
For Rectangular electrode areas, you can rotate the Electrode Area by inserting an angle value or selecting a **Reference Line** to automatically define the rotation Angle.







Extract 2

 Edit the rectangle so it appears over the part as follows:




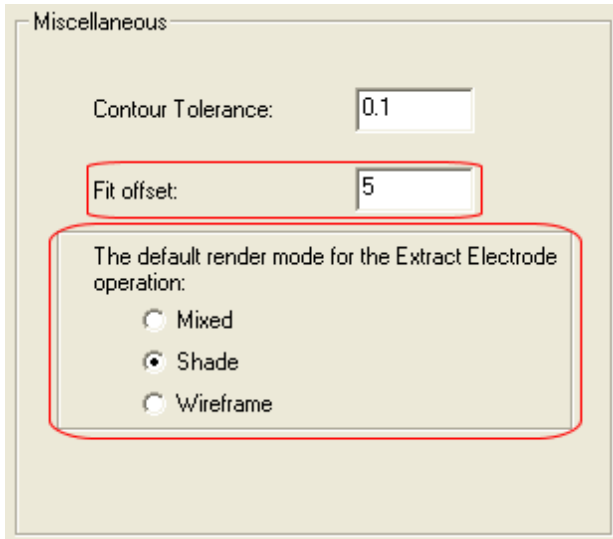
The faces selected are in 'Stand-by' mode. They will now be attached to the electrode:

 Click the Middle Mouse Button to attach the faces to the electrode.

 The burning faces, previously in yellow, now change to green to show they are attached to the electrode.

 In the Feature Guide, click the [Fit To Selection](#) icon.

 The offset distance for the above option is set by choosing **Tools / Preferences** and selecting **Electrode / General / Miscellaneous** in the Preferences Editor.




 In the above menu the default Render Mode for the electrode extraction can be selected.

 Leave the default parameters as they appear below and press **OK** in the Feature Guide.



Electrode Tree

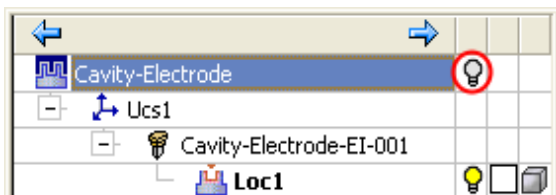
The electrode now appears in the Electrode Tree.

 At the bottom of the Electrode Guide click on the Activate Electrode icon and then on the electrode burning area faces (or vice versa).

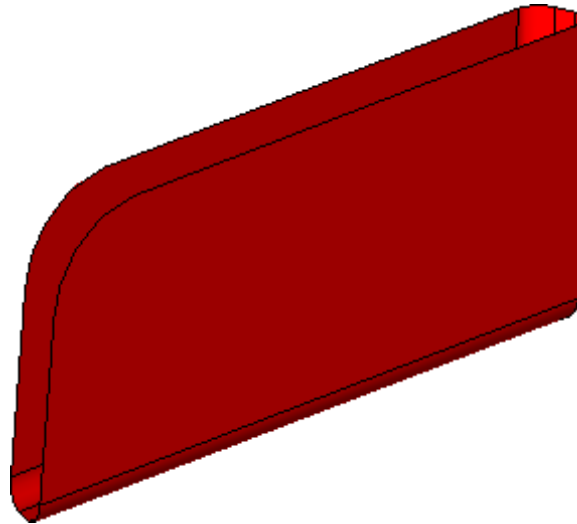



OR double click on the electrode in the Electrode Tree.

 In the Electrode Tree, hide the cavity part.



The electrode burning area faces appear below:



 Once the Electrode has been activated; the Blank, Contour, Extension and Apply Template options, become available in the Electrode Guide.

Blank & Electrode UCS

Blank & Electrode UCS

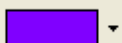





Break Wire Body

In Cimatron E different colors can be set to the blank wire bodies. These colors act as NC Criteria, allowing automatic machining in the NC environment. For more information refer to the Online Help.



 Under **Electrode/Colors** in the Preferences Editor set the following parameters for the blank colors:

Colors

Base color:		Blank top contour:	
Extensions:		Blank lines:	
Electrode part:		Blank Bottom contour:	

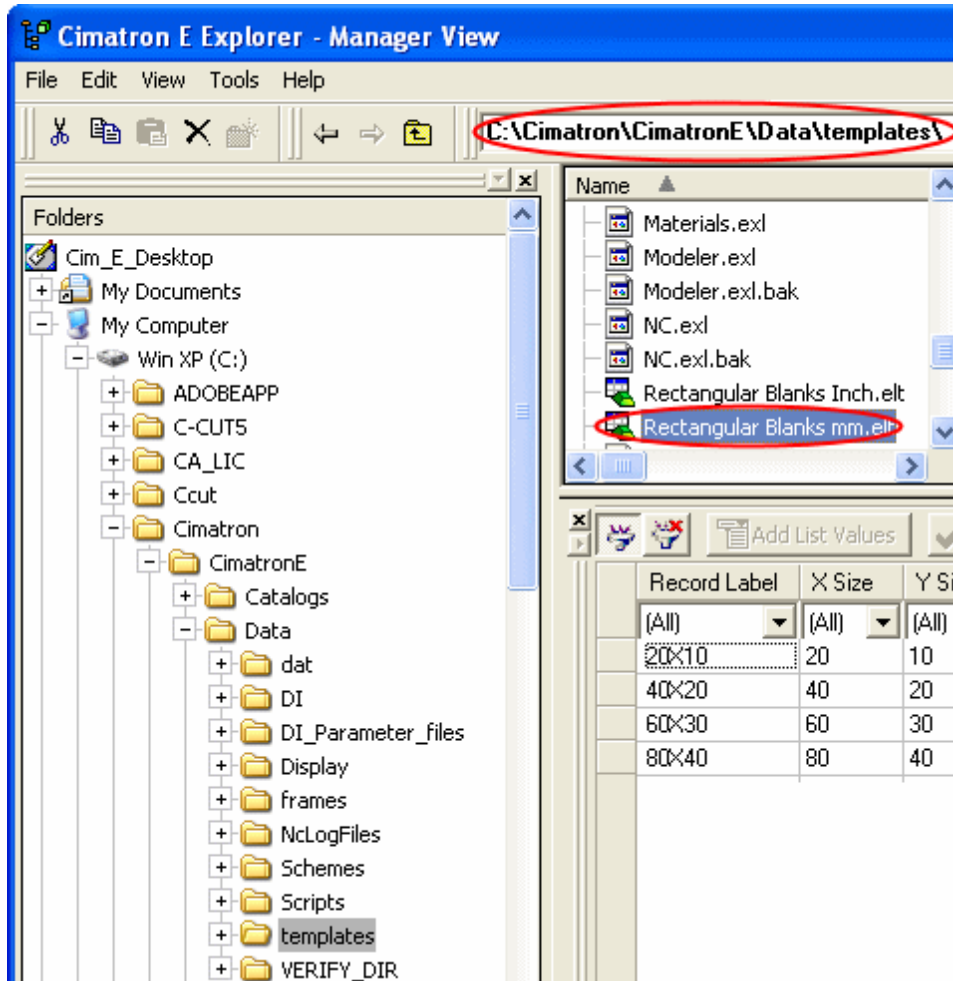
Keep original color Create the blank as a single wire body

Blank

A new Blank Size will now be added to the Blank Library.

☞ Select **File/Cimatron E Explorer** from the Menu Bar to open the Cimatron E Explorer in **Manager View**.

☞ Browse to the `\\Cimatron\CimatronE\Data\templates` directory and select the **Rectangular Blanks mm.elt** catalog.



☞ Press the TAB Key in the last existing column i.e. Copper, and enter the following values:

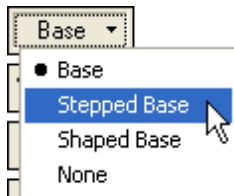
Record Label	X Size	Y Size	Material
(All)	(All)	(All)	(All)
20X10	20	10	Copper
40X20	40	20	Copper
60X30	60	30	Copper
80X40	80	40	Copper
15X25	15	25	Copper

☞ Close the Cimatron E Explorer.

☞ Click on the Blank icon in the Electrode Guide.



☞ Change the type of Base to **Stepped Base**.



💡 This is a Base with a small step which makes the measurement of the electrode NC offset easier. As this step can be easily measured, it can be used as a verification tool to ensure that the correct offset was used.


☞ Set the following parameters for the blank:

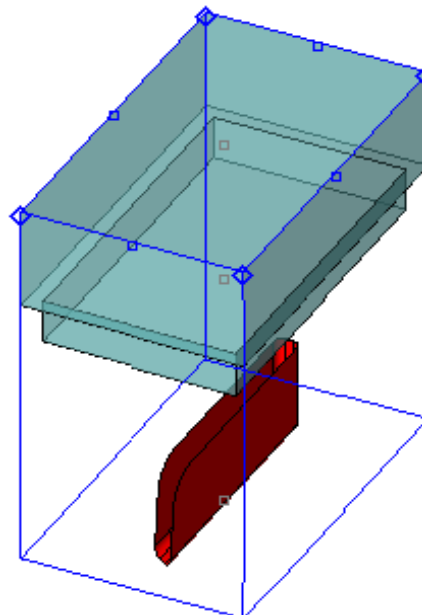
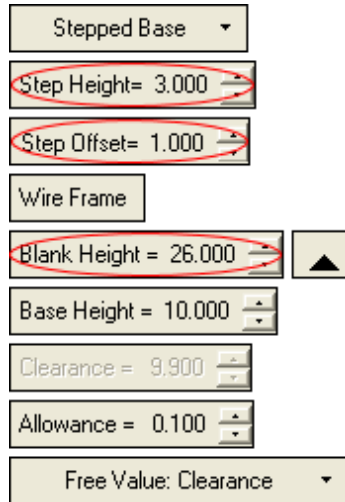
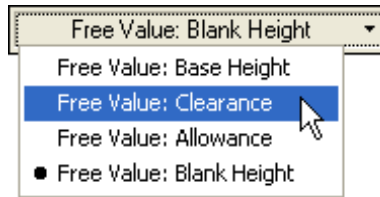
☞ Toggle the Free Blank Size option to **Use Blank Library** and click on Edit Parameters.




☞ Select the Blank created above, from the library:

Select Catalog Item		
Record Label	X Size	Y Size
(All)	(All)	(All)
15x25	15	25
20x10	20	10
40x20	40	20
60x30	60	30
80x40	80	40

 Set the Free Value to Clearance.




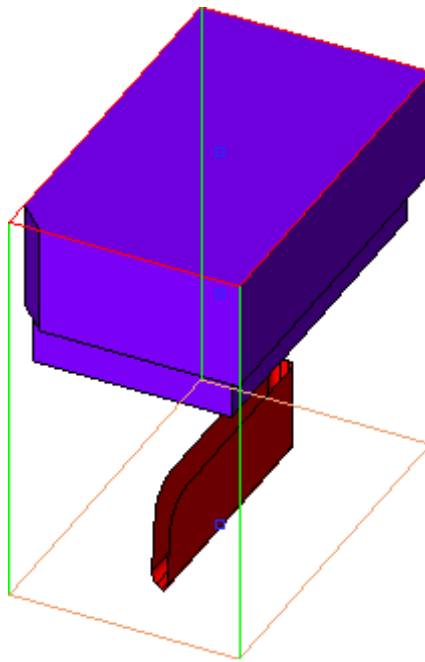
 It is also possible to work without the Wire Frame guidelines.


 Click on the **Mark Base** icon in the Feature Guide.

 Select the **Chamfer** option.



 Change the size to **2** and press **OK** in the Feature Guide.




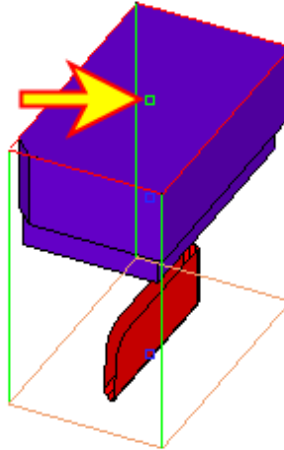
 The chamfer has been created using the default preferences option i.e. the corner closest to the reference UCS.


Electrode UCS

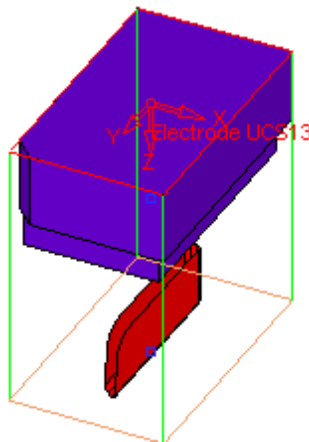
 Click on the UCS icon in the Electrode Guide.




 Click on the point marked below:




 Click **OK** in the Feature Guide.




 The Electrode UCS was automatically orientated for machining.

 The Electrode UCS is used as the reference point for the electrode in drafting and report applications.


 Only one Blank and Electrode UCS can be created per electrode, so if the Blank or Electrode UCS stages are clicked now, the Feature Guide will open up, allowing for Edit ONLY.

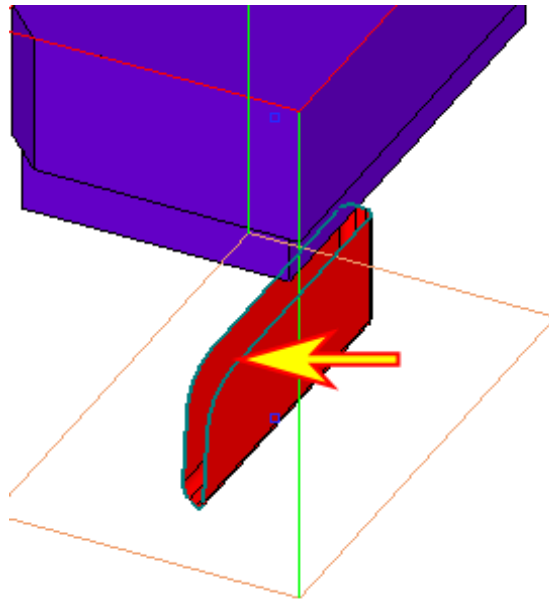
Extension

Auto Contour


 Click on the Auto Contour icon in the Electrode Guide.




 A contour has been automatically created along the open edges of the burning area faces.





2 Directions

 Click on the Extension icon in the Electrode Guide.

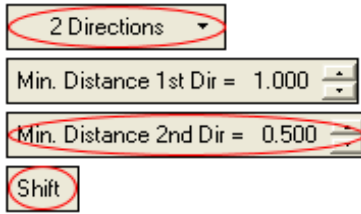



 The contour is automatically picked.

 Change the Tangent Option to **2 Directions**.


 Change the Min. Distance 2nd Dir. to **0.5**.

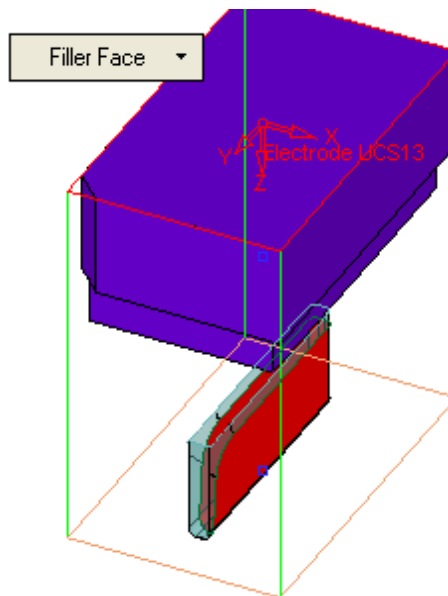
 Toggle the Offset option to **Shift**.




 Toggling the **Offset/Shift** button lets you define the best geometrical extension method for the specific face. (For concave faces it is usually preferable to select the Shift option).

 Click on the **Filler Face** icon.

 Click **Apply** in the Feature Guide.




A filler face has been applied to the side of the electrode.

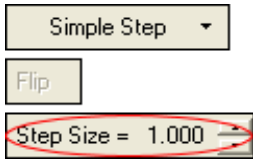
 The next contour has been automatically picked to extend.


To Blank


 Change the Tangent option to **Direction**.

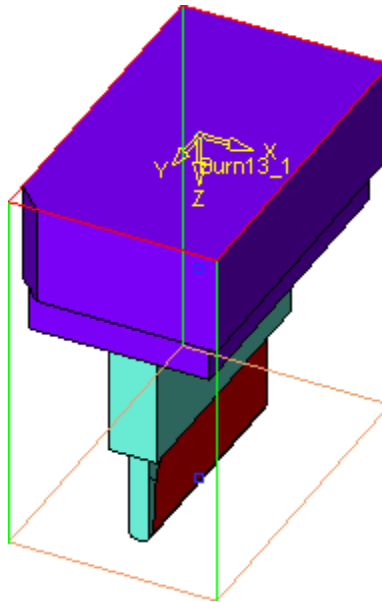
 Change the Length option to **To Blank**.


 Click on the **Step icon** and make sure the Step Size is set to **1**.




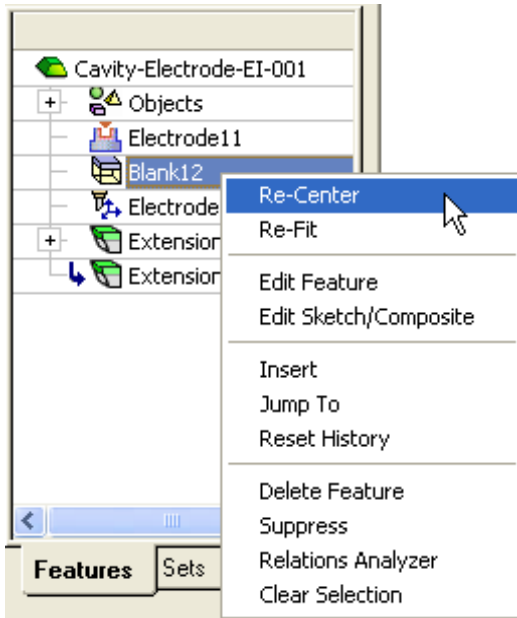
 The default Step option is **Simple Step**. In the case of a rectangular blank, the Simple Step is a surface between a bounding box formed around the defined contour and an offset of it.

 Press **OK** in the Feature Guide.



 Right Click on the Blank Feature in the Feature Tree and select Re-Center.

 This option Re-Centers the electrode Blanks to all the electrode faces.



 The Re-Center and Re-Fit operations update the Blank feature, considering any new geometry created.

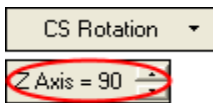
Holder

☞ Click on the Holder icon in the Electrode Guide.

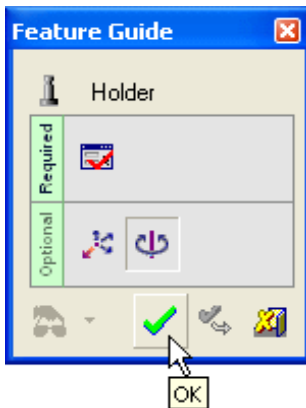


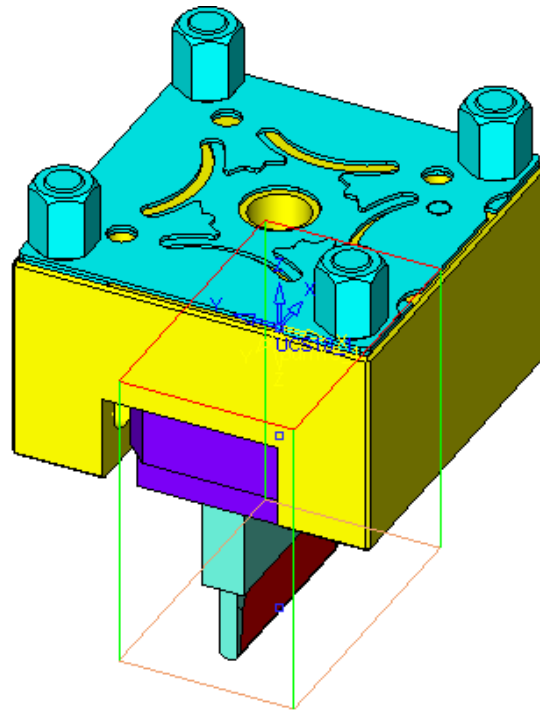
☞ From the Cimatron E Explorer, select the **Holder 1.elt** file (located in the **\\Tutorial Work Files\Data To Steel\Holders** directory).

☞ In the Holder Feature Guide, click on the **Set Rotation Parameters icon** and set the following parameters:



☞ Click **OK** in the Holder Feature Guide.



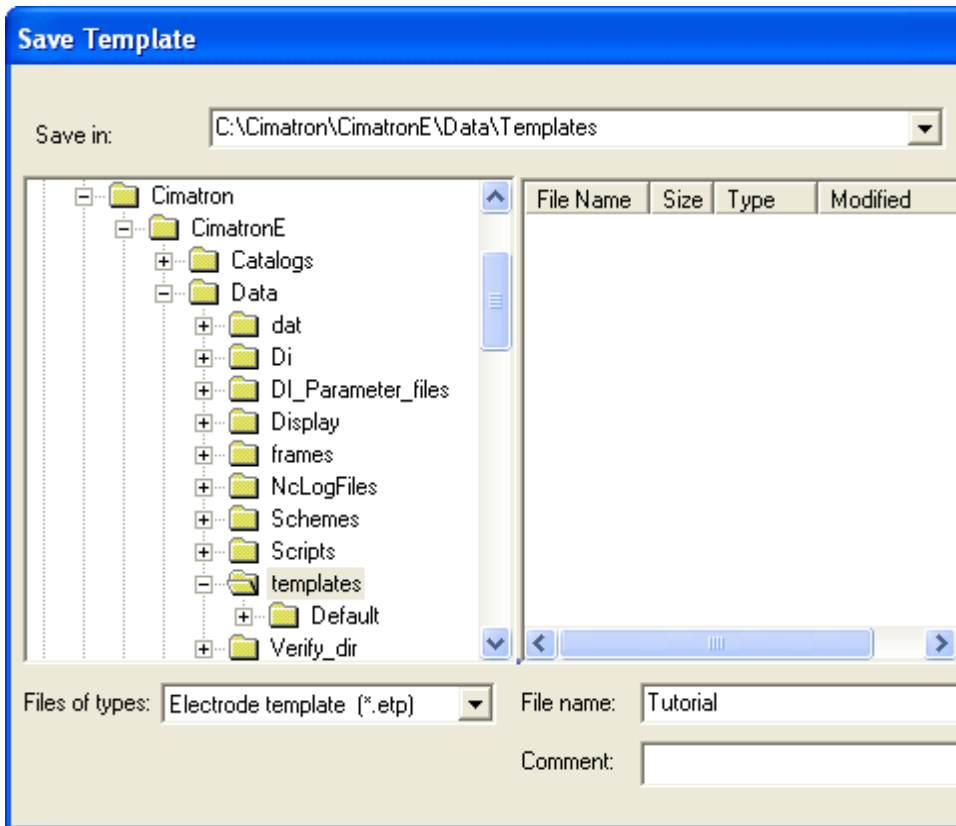



Electrode Template

Save Template

A template of the features used in this electrode will now be created.

-  Select **Electrode/Save As Template** from the main menu bar.
-  Save as **Tutorial** under the `\\Cimatron\CimatronE\Data\Templates` directory.




 A template can hold one or more of the following features, which have been created in the electrode document: Blank, Electrode UCS, Holder, and Extension features.

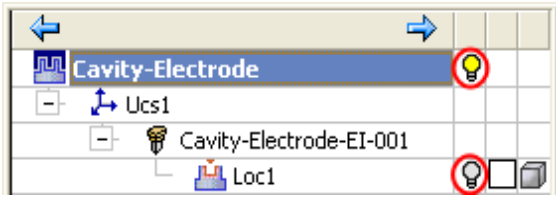
Load Template


 In the Electrode Guide click on the Activate Main Assembly icon to activate the assembly.



OR double click on the Part in the Electrode Tree.

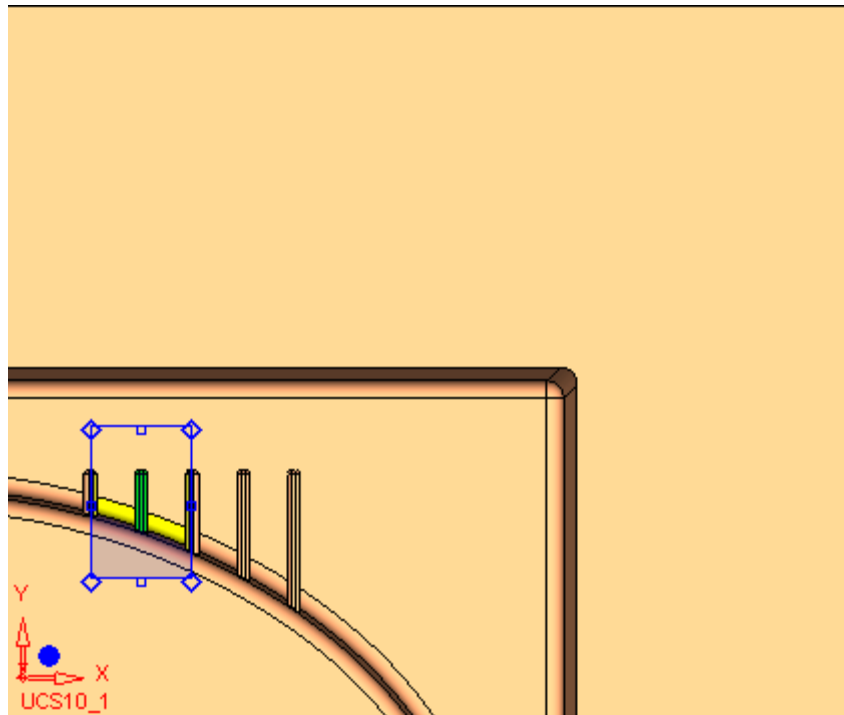
 Show the Cavity part and hide the first electrode.



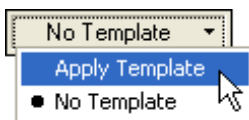
 Use the **Fit To Selection** option to extract the second electrode shown below:





As with the first electrode, click on Extract Electrode icon from the Electrode guide on the right hand side of the screen and then click on the part to extract a new electrode.

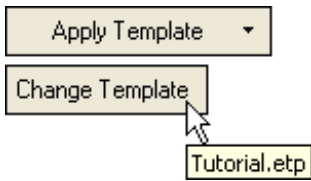



 Attach the faces to the electrode and change the No Template option to **Apply Template**.



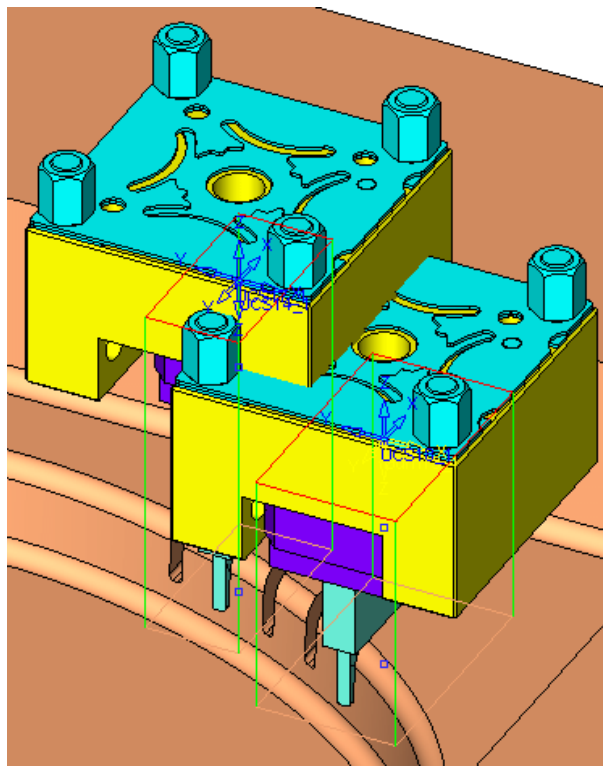
 Click on **Change Template** and select the file **Tutorial.etp** from the Load Template dialog.

 Move the cursor over the Change Template button and notice the current templates name.



 Click **Apply** in the Feature Guide.

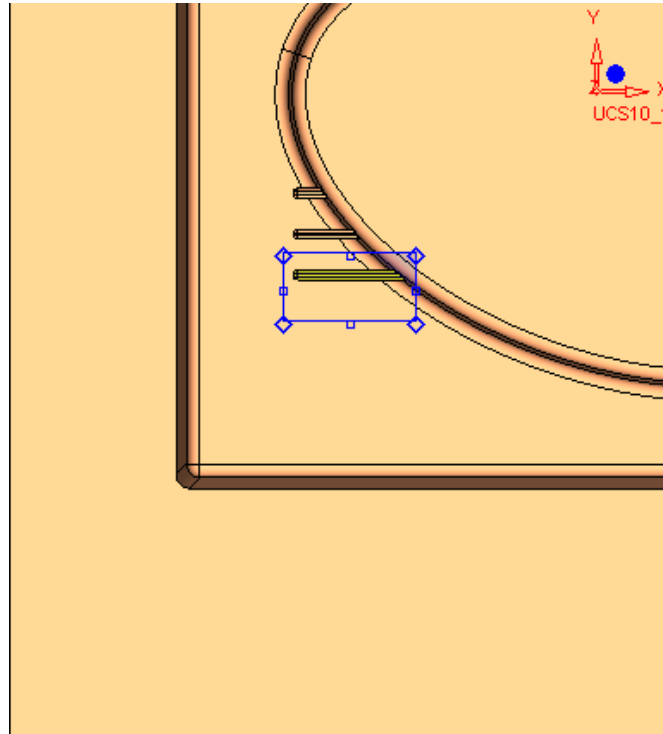
The second electrode has now been created.



Further Electrodes

Right Angle

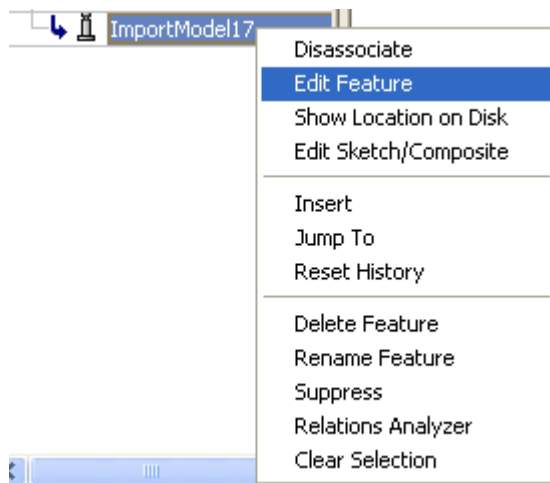
☞ Create the third electrode at a right angle to the two previous electrodes:



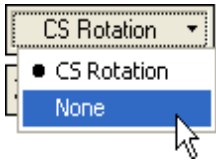
☞ Attach the burning faces, select Fit To Selection and press **OK** in the Feature Guide.

💡 Cimatron E has used the template, for an electrode with different dimensional properties.

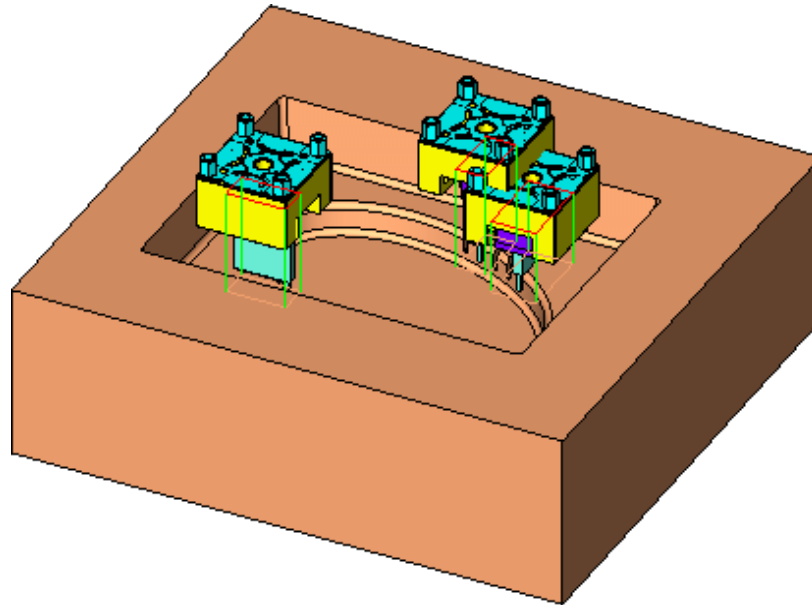
☞ Activate the electrode and [Edit the Holder](#).




 Remove the Rotation parameter.



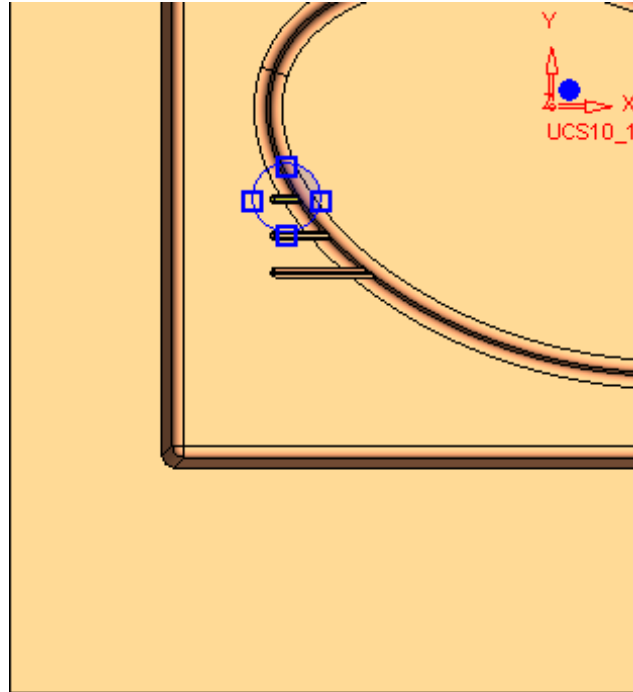
The three electrodes now appear as follows:





Cylindrical

 Now create the fourth electrode using the Cylindrical option:

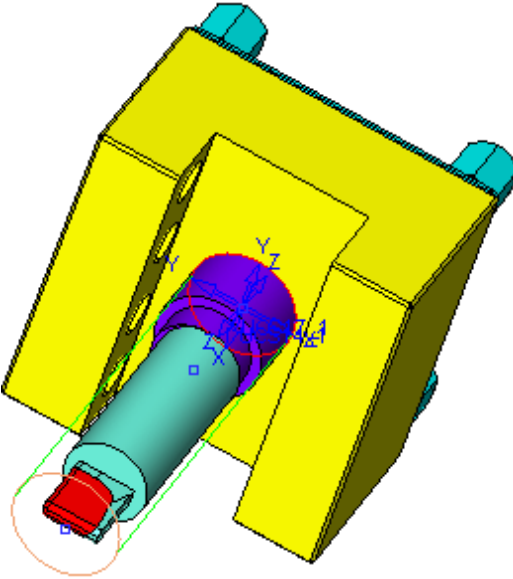
In the Extract Electrode mode toggle the Rectangular option to Cylindrical and use the template.



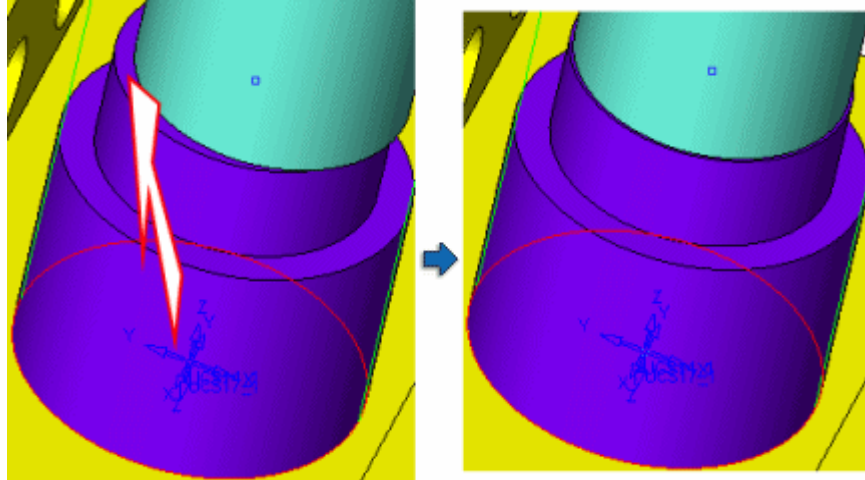
 Press **OK** in the Feature Guide.

 The Electrode UCS reference points are available within Cylindrical Blanks option.

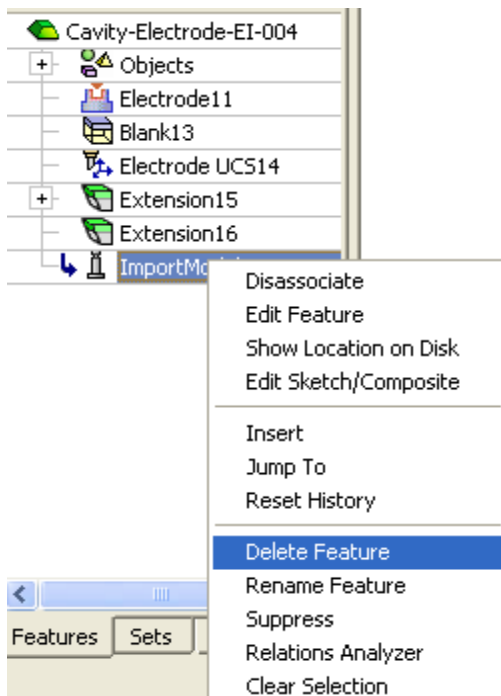
It can be seen that the electrode is not centered on the blank and that the holder is not appropriate.




☞ Re-Center the blank.




☞ Delete the current holder.

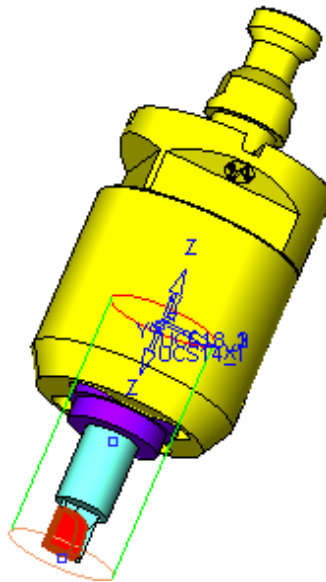


☞ Click on the Holder icon (in the Electrode Guide) and from the Cimatron E Explorer select the **Holder 2.elt** file (located in the \\Tutorial Work Files \Data To Steel \ Holders directory).

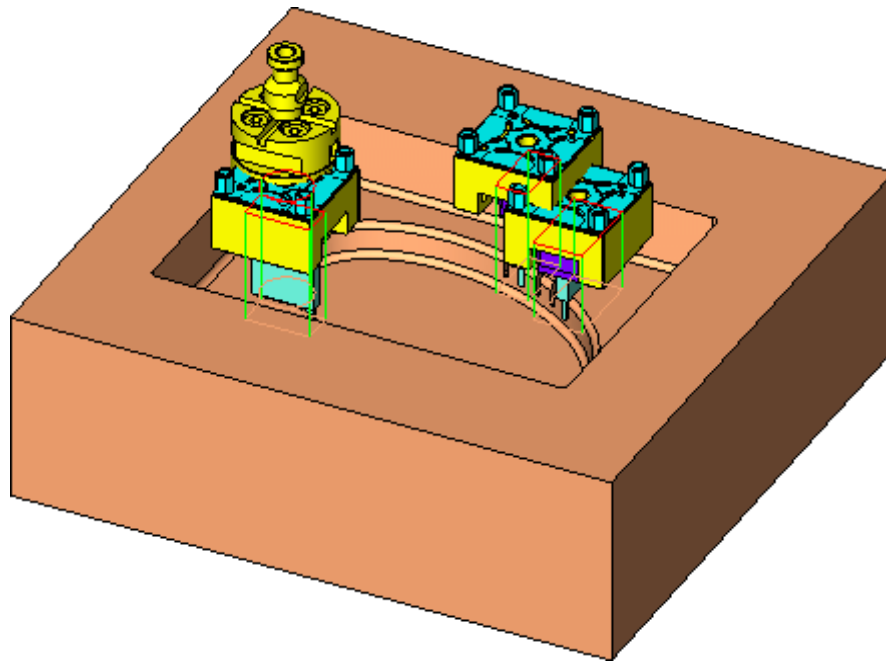
 Edit the Blank feature and change its parameters as shown below:

 Decrease the **Diameter** to **15.5** and increase the **Base Height** to **18**.

Cylindrical	Stepped Base ▾
Free Blank Size ▲	Step Height= 3.000 ▲
Diameter = 15.500 ▲	Step Offset= 1.000 ▲
X Position = -42.584 ▲	Wire Frame
Y Position = -15.200 ▲	Blank Height = 36.000 ▲
Z Position = 52.000 ▲	Base Height = 18.000 ▲
	Clearance = 11.900 ▲
	Allowance = 0.100 ▲
	Free Value: Clearance ▾



The Electrode assembly now appears as follows:

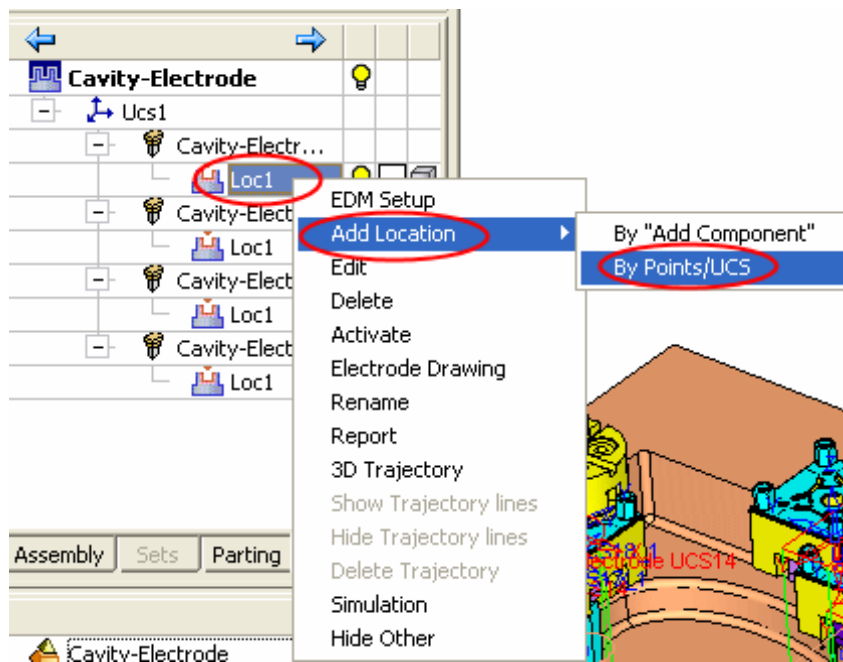



Add Electrode

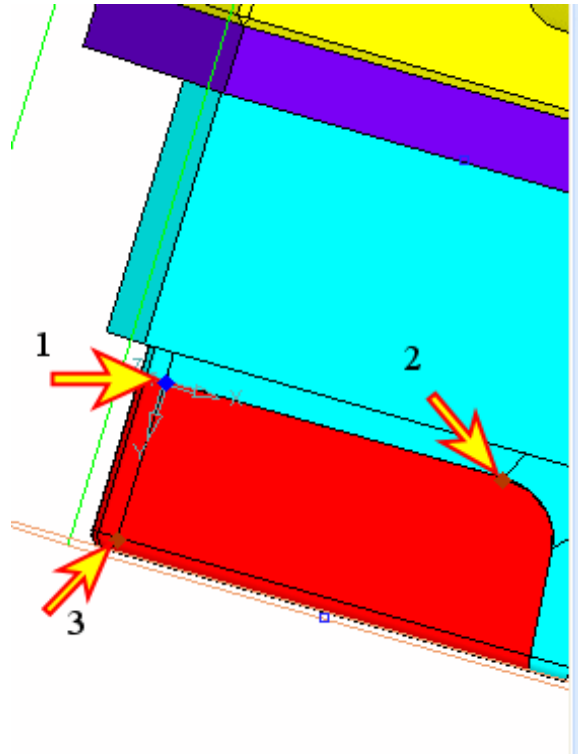
Connect


☞ Activate the Assembly.

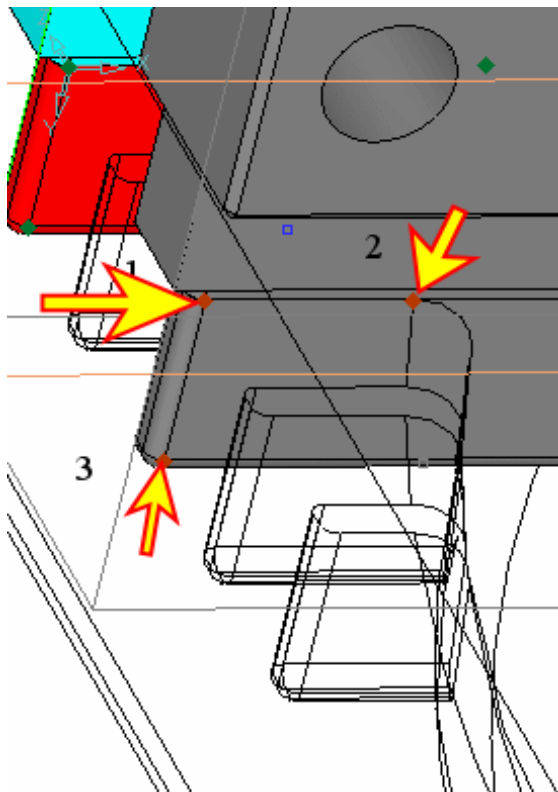
☞ Right click on **Cavity-Electrode-EI-001 Loc1** in the Electrode Tree, and select Add Location By Points/UCS.




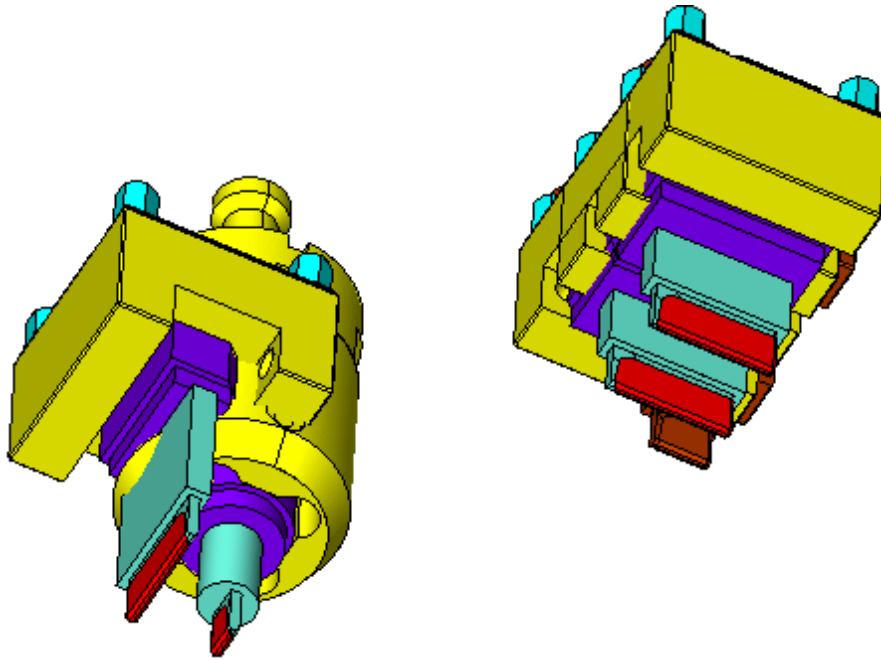
 Select the point shown below:




 Now select the following point.




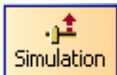
 Press **OK** in the Feature Guide.



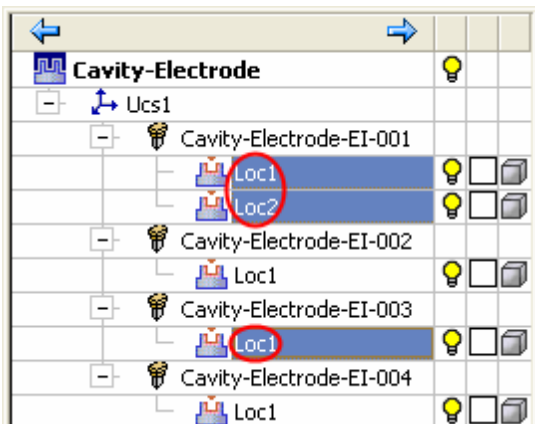
 The Wire Frame guidelines have been removed for easier viewing of the assembly.


Simulation

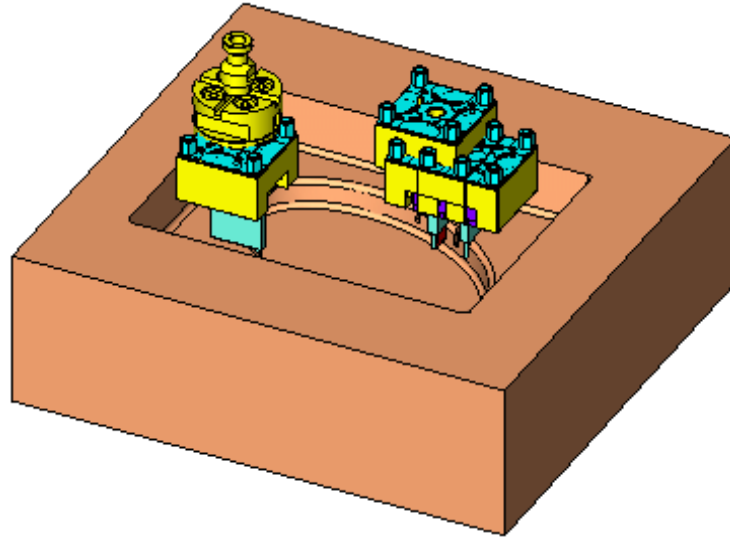
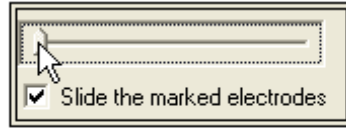
 Activate the assembly and click on the Simulation icon in the Electrode Guide.



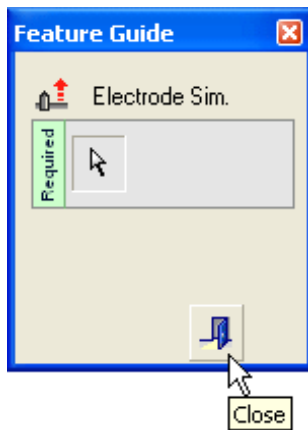
 Mark the following Electrodes.



 Slide the electrodes as shown below:



 Close the Electrode Simulation Feature Guide.

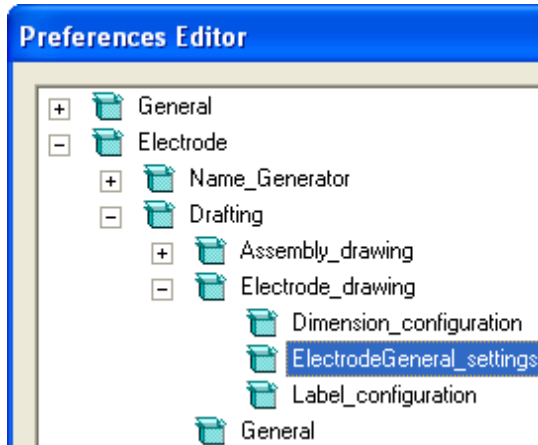


Drafting

Preferences

A drafting of the first electrode will now be created.

☞ Open the Preferences Editor, found in the Tools menu, as follows:



☞ Under the **ElectrodeGeneral_settings** tab, click on the open folder icon by 'Create one combined drawing'.

☞ Select the **combined drawing template** (located in the **\\Cimatron\CimatronE\Data\Templates** directory) and check the **Show burn location dimensions in assembly view box**.

Show burn location dimensions in assembly view

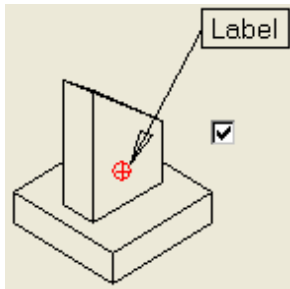
File name:

💡 The Combined drawing template combines both the burn location and inspection drawings into one sheet.

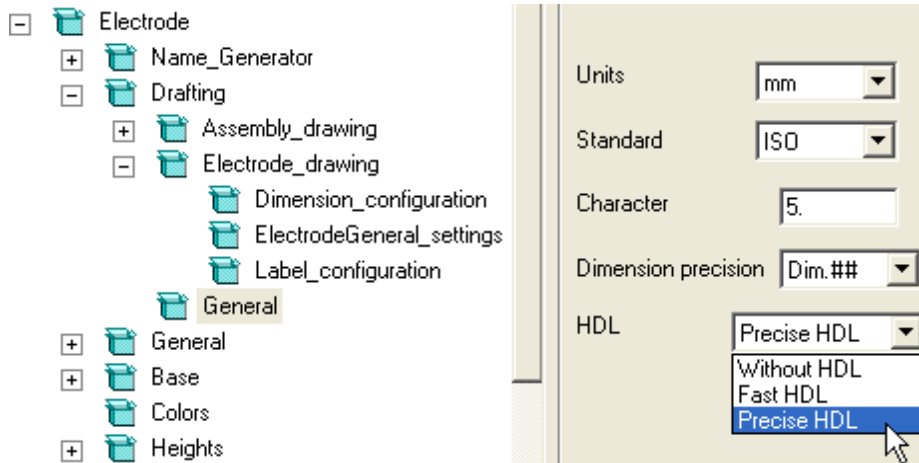
💡 The 'Create 2 sheets drawing' option is used when both the electrode assembly draft (via Burn location drawing.tpl) and the inspection drawing of a specific electrode (created by inspection drawing.tpl) are required.

☞ Under **Dimension_Configuration**, set the parameters shown here.

☞ Under **Label_Configuration**, verify the ISO view is checked.



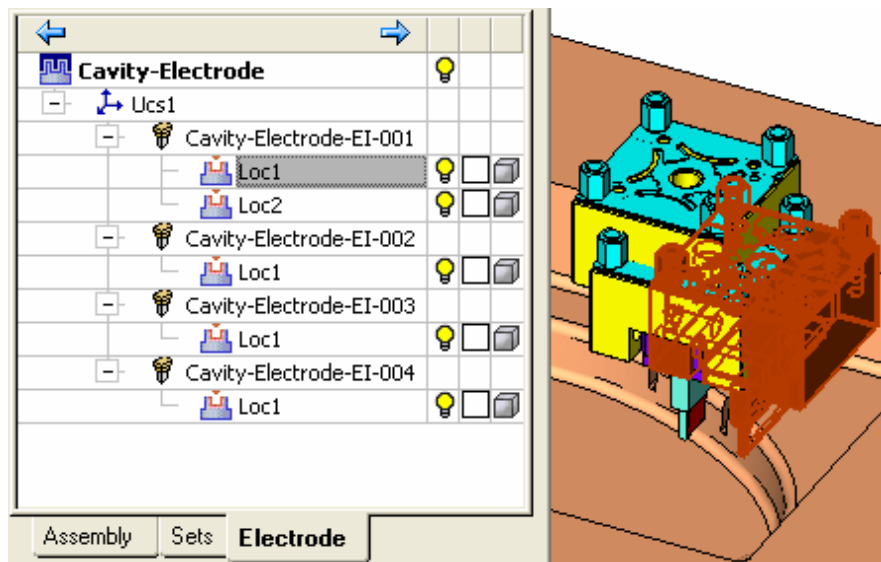
☞ Finally, ensure that, under the General tab the HDL (hidden line) option 'Precise HDL' is selected:



☞ Press **OK** in the Preferences Editor.

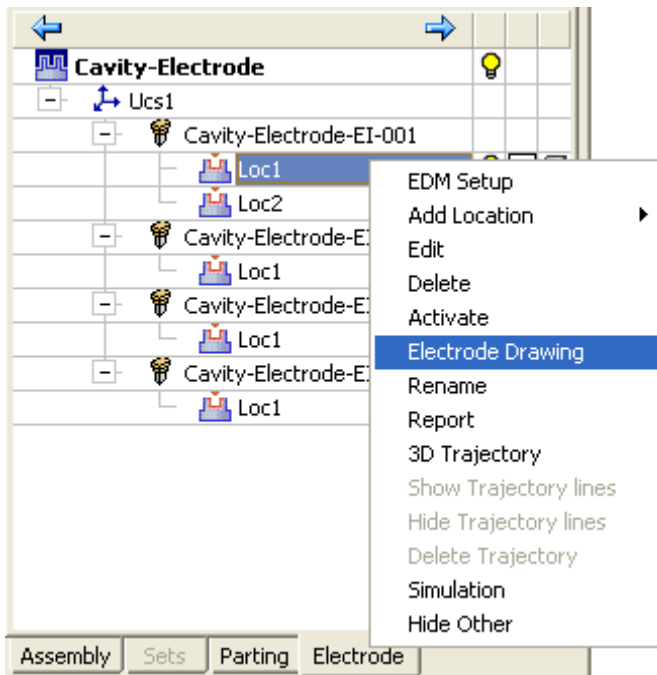
Create

☞ In the Electrode Tree, select the first electrode created:

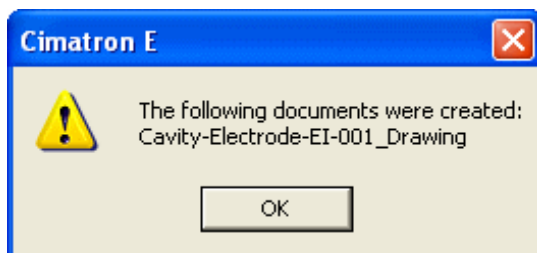


💡 By pressing and holding the Ctrl key more than one electrode can be picked, the result being a new sheet created in the drafting environment, for each electrode.

Either right-click on the electrode within the Electrode Tree or select **Electrode/Create Electrode Drawing**.



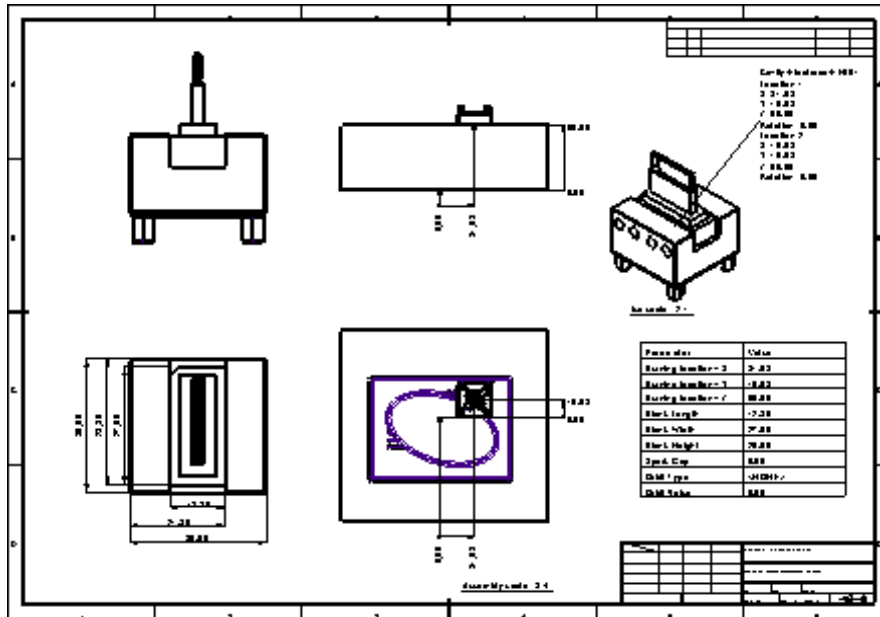
At the end of the creation process, the following message will appear:



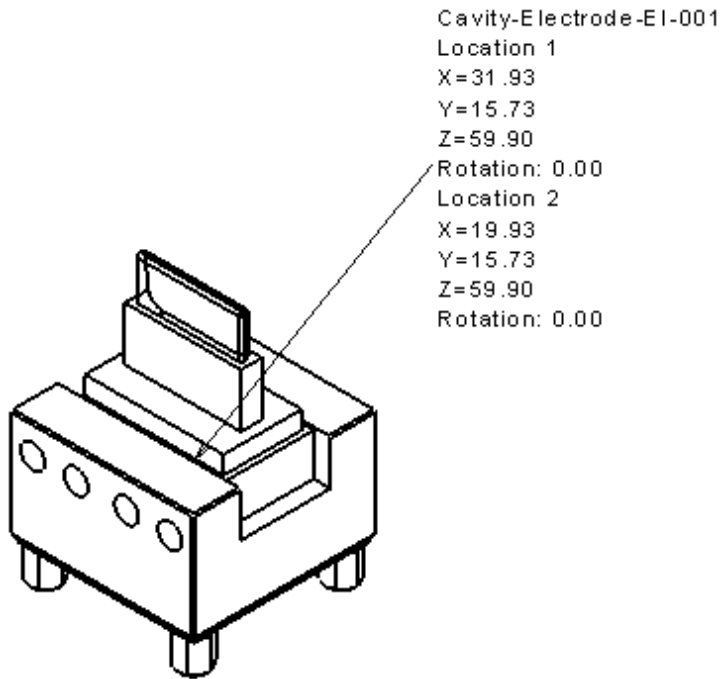
Draft

☞ Open the drawing document **Cavity-Electrode-EI-001_Drawing.elt**.

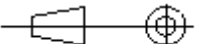
+ Cavity-Electrode-EI-001_Drawing.elt



☞ Zoom into view the **Iso Electrode** view to observe the parameters of the electrode.



☞ View the draft details, located at the bottom right of the frame:

Assembly : Cavity-Electrode		
DWG . NAME: Cavity- Electrode -EI-001_ Drawing		
SIZE A2	REV.	DWG . No .
SCALE 3:1	SHEET 1 OF 1 SHEETS	

💡 The **Cavity-Electrode** name appears in the Title Box, by means of the Symbolic Text parameter in Cimatron E. This, along with other drafting features will be used in the next chapter. It is advisable to complete the Drafting tutorial before continuing with this tutorial.



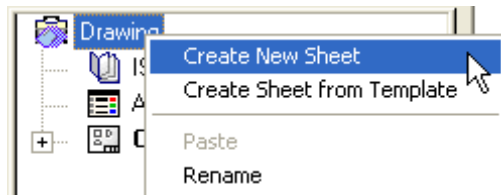
☞ **Save** your work and leave the drafting application open.

Drafting Template

Drafting Template

Construct

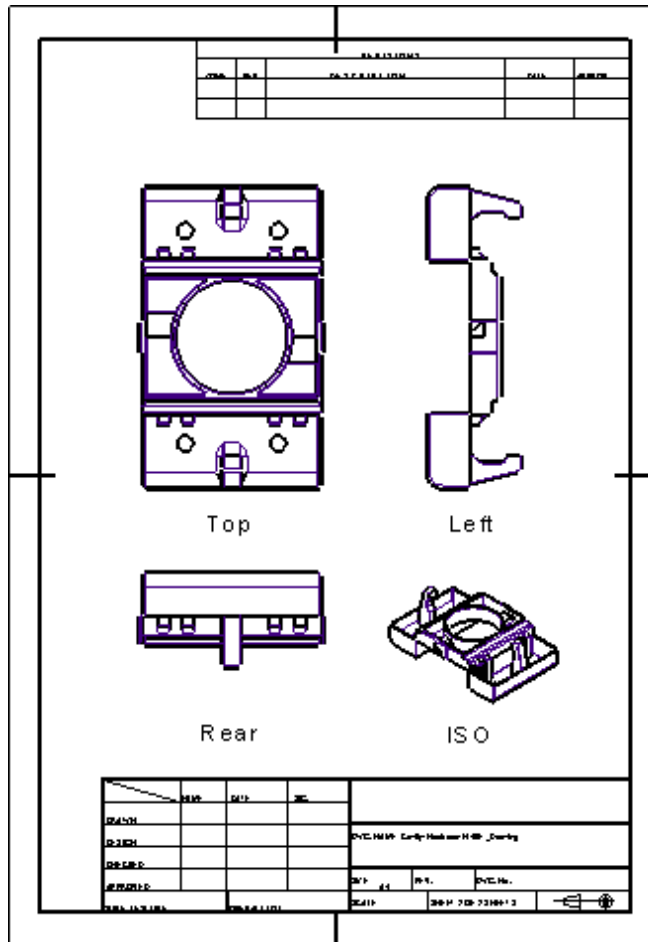
☞ Within the **same** drafting document, **create a new sheet**.



☞ Open the **View Creation dialog** and select the **Lid.elt** part document (located in the **\\Tutorial Work Files\Data To Steel** directory) from the Cimatron E Explorer.

☞ Within an **A4** frame Position the views as follows:

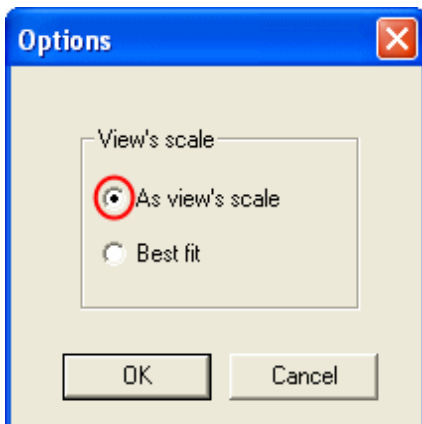
💡 Set all **Top, Left** and **Rear** views scale to **2:1**.









☞ Select **Sheet/Template/Save Sheet as template**.

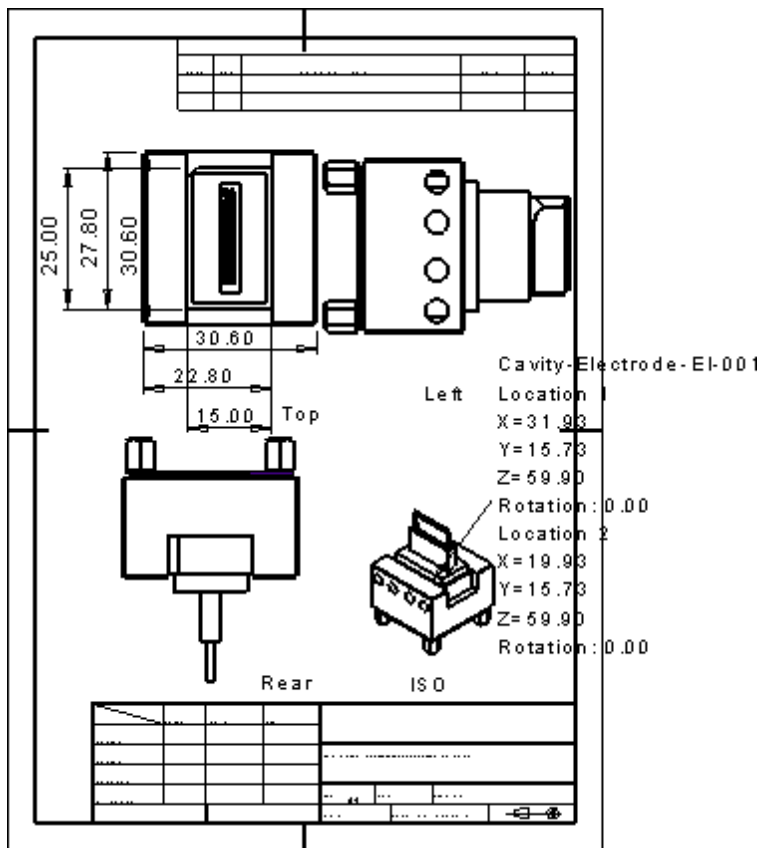
☞ Type **Electrode** in the File name box and click on the **Parameters** button to the right of the dialog.


☞ Set the following options and click **OK** in the Drafting Templates dialog:



Apply

-  Return to the electrode assembly.
-  Open the Preferences Editor to the **ElectrodeGeneral_settings** tab.
-  By 'Create one combined drawing', select the **Electrode** template just created, and press **OK**.
-  Right click on the first electrode in the Electrode Tree and select 'Electrode Drawing'.
-  The electrode now appears using the Electrode template created:
-  The Scale saved in the template is applied in the sheet.



-  **Save your work.**