
Light Representations

This Web training task introduces Light Representations in ThinkDesign, a feature that makes working with Large Assemblies much easier. When managing assemblies - large assemblies in particular - you may load, visualize and modify assemblies composed of thousands of parts, many of which may be very complex on their own. By applying Light Representations to some or all the X-Ref Components, the component's status requires less memory and graphics resources and the entire assembly becomes lighter and easier to be loaded and visualized.

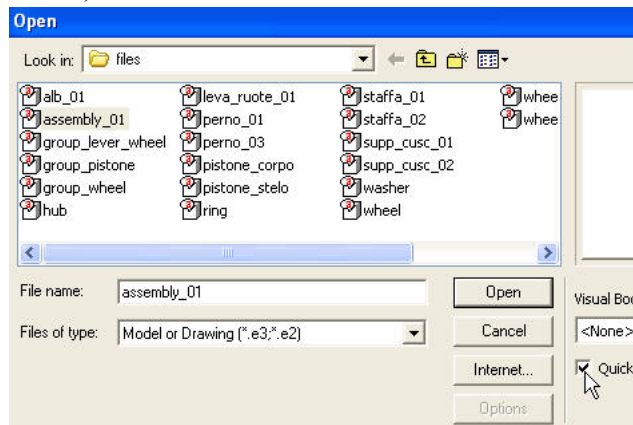
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1. Step1 : Light Rep behavior

We will load an assembly with Light Representations on.

- **Open** "assembly_01.e3" from the task installation folder with Quick Load option ON in the lower right corner, as shown.

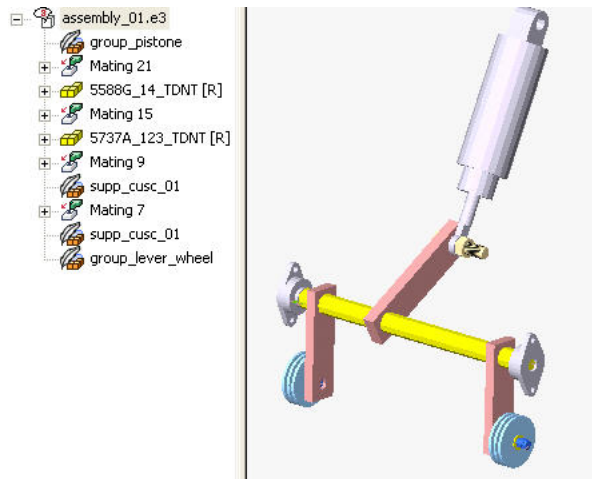


Note that for the first time ThinkDesign has to generate the Light Representations, as we're loading our assembly in **Flat Tessellation** mode.

The **Flat Tessellation** Light Representation is generated automatically. It enables a Light Representation at the lowest, quickest to load tessellation level. In this mode, the X-Ref's component's History Tree information is not available to view.

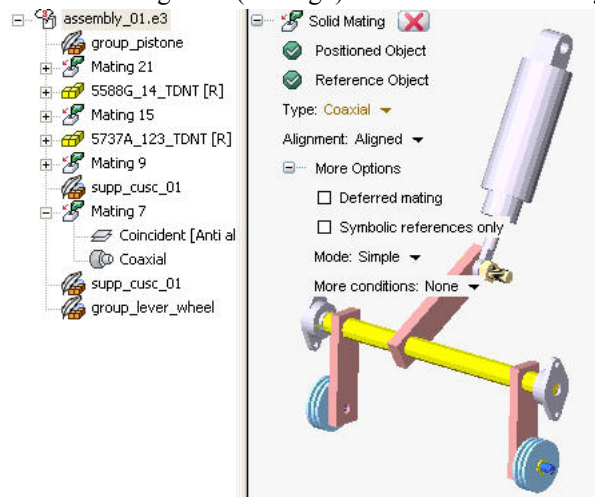
Examine the History Tree and notice that Light Reprs are applied only to X-Ref Components and not Local Components.

Notice in the image below that the X-Ref Components "group_lever_wheel," "supp_cusc_01" and "group_pistone" are in Light Representation Mode (the feather on the History Tree node) whereas the Local Components in the assembly are not.



When a component is loaded in a Light Representation, the parametric behavior of the whole assembly is preserved. Any existing parametric dependency related to that component (mating, profile references and so on) works properly, regardless of the current component's representation.

While in Light Representation mode mates cannot be added, but they can be managed. The figure below shows that an existing mate (Mating7) can be Redefined in Light Rep mode.

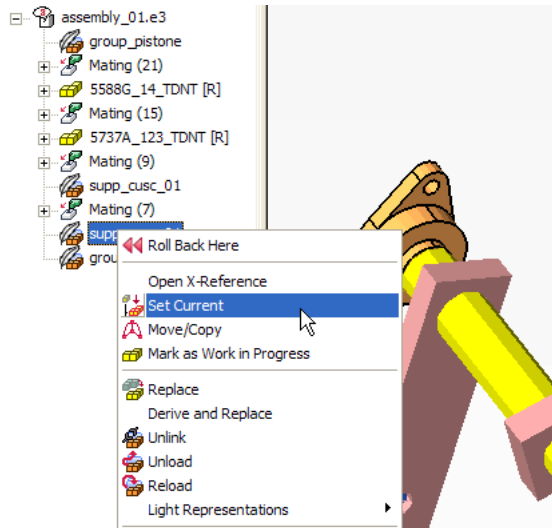


2. Step2 : Switch between Light Reps

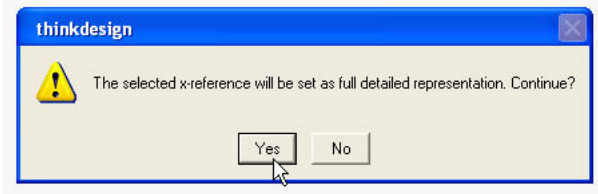
In this step, we will explore the possibilities of switching a Component between different Light Rep modes.

Let's first Set one component current and make some changes to it.

- Right click on Component "supp_cusc_01" and Set it Current using the **Set Current Component** command as shown



A Warning message will display as shown...



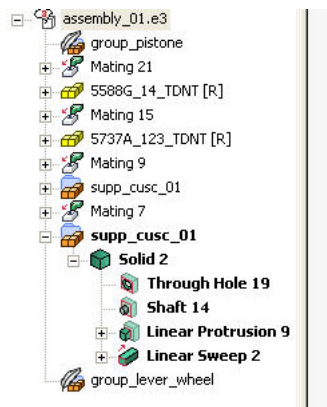
- ...Hit Yes
- Hit OK to complete the operation.

ThinkDesign switches the Component to **Full Detail** mode because it needs the History/Geometry of the model.

The **Full Detail** command enables you to apply full-detailed representations to X-Ref Component currently displayed in Light Representations.


Also note that the **Full Detail** representation is the default representation for X-Ref Components.

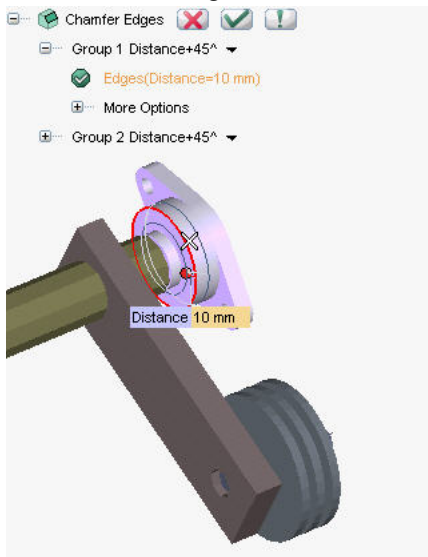
Checking the History Tree, notice that now the complete hierarchy of the component construction is visible and available to the user.




Let's now insert a Chamfer on one of the edges of this component.

- Start **Edge Chamfer** command

- Select the  Edge as shown and set Distance 10

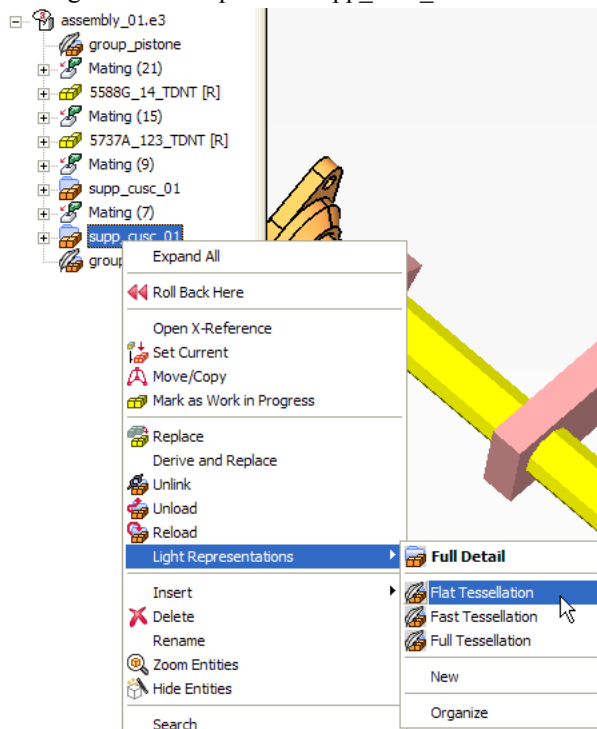


Click  OK to complete the Chamfer operation.

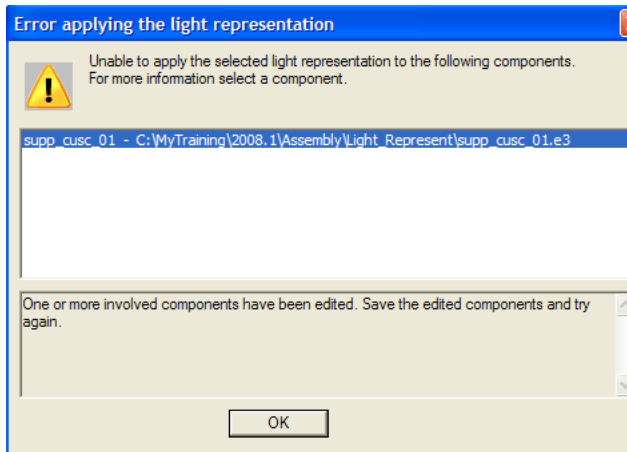
- Double click in the graphic area to **Set Current Component** back to the top level.
- Hit **Rebuild Model**.

Let's now try to set the same Component to **Flat Tessellation** mode and see what happens.

- Right click Component "supp_cusc_01" and set the Light Representation to **Flat Tessellation**



A warning message will display as shown...

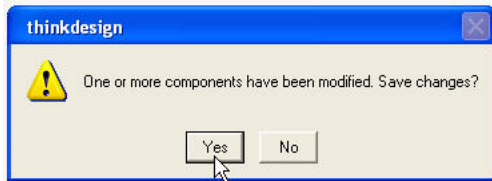


- ..Hit OK...

...then click again OK to the warning.

- **Save** the file with the modifications.

Another warning message will display as shown...

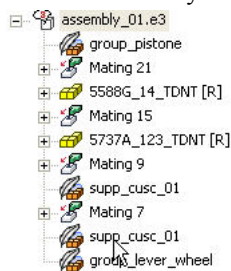


- ...Hit Yes.

Try again to change the Light Rep status of the "supp_cusc_01" component to **Flat Tessellation**.

This time -- success!

Check the History Tree to confirm it.

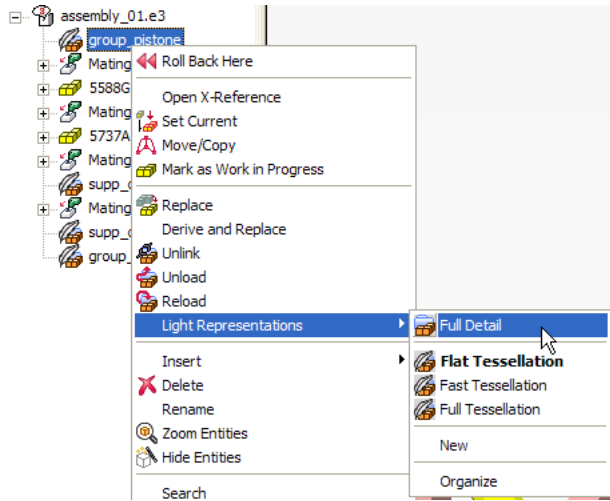


Notice that the hierarchy of the component construction is not available. ThinkDesign, during the **Save** operation, automatically updates the Tessellation parameter.

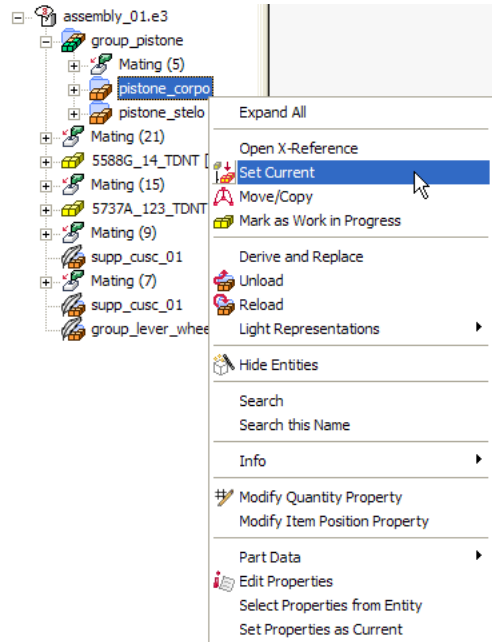
- **Hit Fit View**.

We will now try to change the Light Representation parameters of another component.

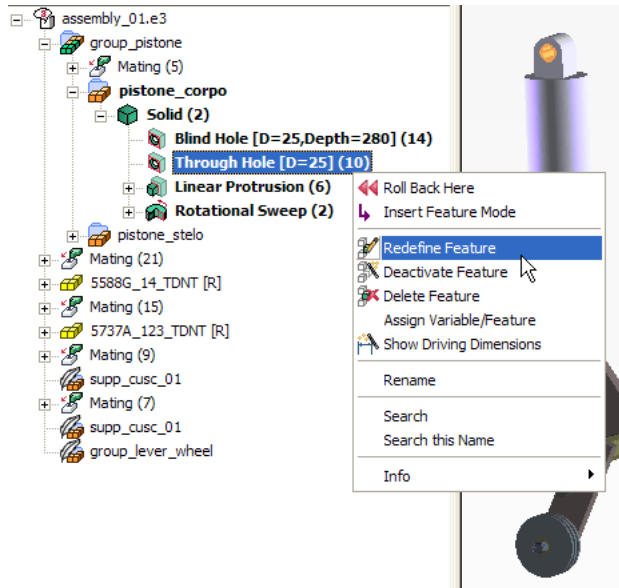
- Right click Sub assembly "group_pistone" and set it to **Full Detail** as shown below.



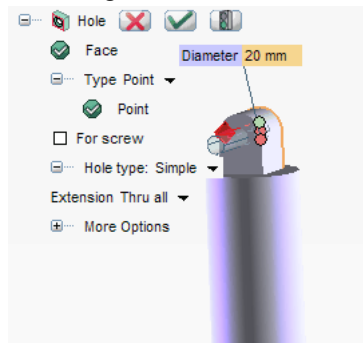
- Right Click Component "pistone_corpo" and set it current using **Set Current Component**.



- Right Click the Through Hole feature in this part and go to **Redefine Feature** as shown.



- Change the Diameter value to Diameter20 and hit **Rebuild Model** .



- Double click in the graphic area to **Set Current Component** back to the top level.

Then click **Rebuild Model**.

- Try to bring "group_pistone" into **Flat Tessellation** mode and you will get similar warnings as when you tried for component "supp_cusc_01."

- So **Save** the assembly and then return to **Fast Tessellation**...

...and it will work this time. Essentially, ThinkDesign has to update the Tessellation parameters for the change to take effect.

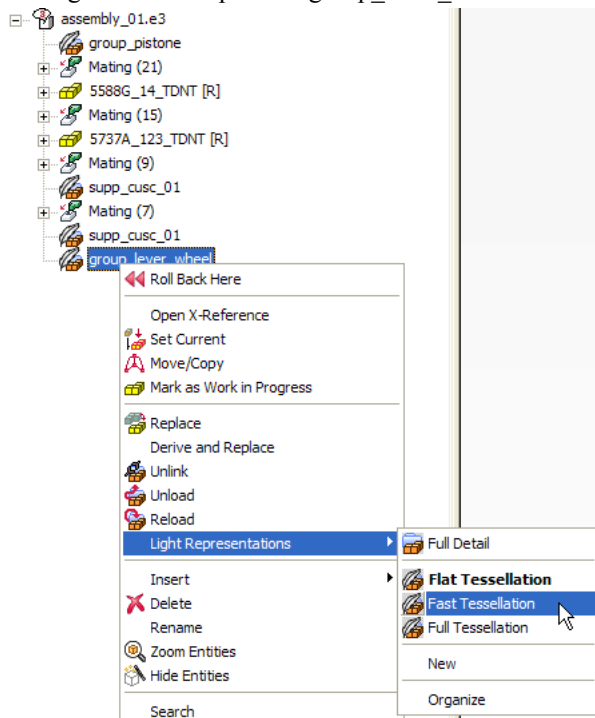
Let's now try using another Light Representation Mode: **Fast Tessellation**.

The **Fast Tessellation** command enables you to apply a Light Representation at an intermediate tessellation level to a desired Component.

The **Fast Tessellation** Light Representation is generated automatically. When the command is used, the History Tree displays the hierarchy of the sub-components but doesn't show the list of the construction events. This is the difference between Flat and Fast Tessellation modes.

Let's check it out...

- Right Click component "group_lever_wheel" and set the Light Representation mode to **Fast Tessellation**.



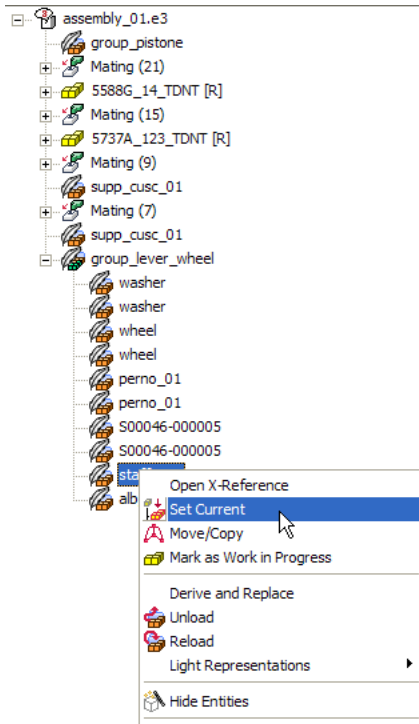
- The same warning messages as before will display again if the Component is being set to **Fast Tessellation** for the first time.
- Change the Component to **Full Detail** mode and then back to **Fast Tessellation**.

Notice the History Tree of the Component - the hierarchy is seen whereas the events of construction are not.

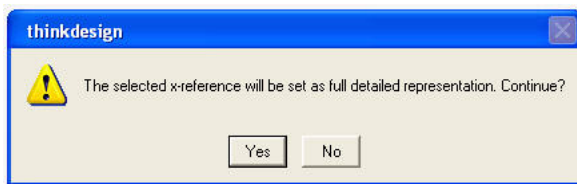


Another important aspect of working with Light Representations is that ThinkDesign's standard information tools can still be used just as they are used with ../../Common parts. Let's take a look at this feature.

- **Set Current Component** on "staffa_01" from the History Tree.







The Component will be turned to **Full Detail** representation...

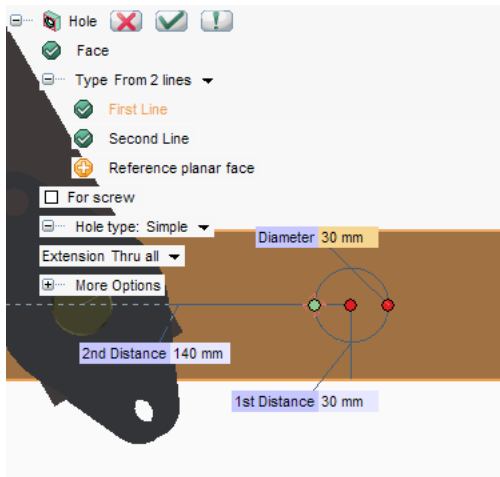


- ...Hit Yes.

NOTE: A single component can be loaded and worked on while existing in a subassembly by switching only that component to **Full Detail** mode and not all the components in the subassembly. This loads only the part that needs work.

Let's now insert a Hole in this component.

- Start **Hole** Command .
- Select the Face as shown.
- Set  Type From 2 lines and select as the  First Line and  Second Line the adjacent highlighted edges as shown below.
- Set 1st Distance30, 2nd Distance140 and Diameter30.

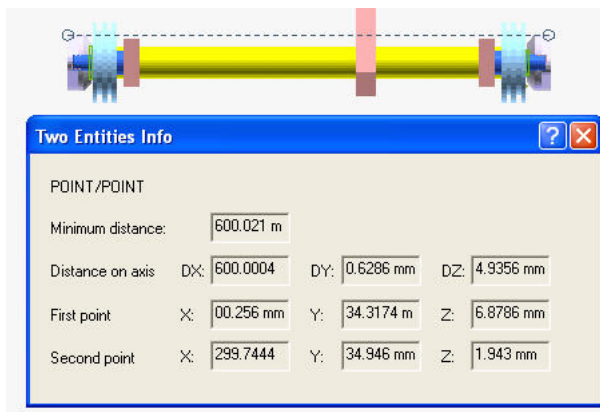


Click OK when finished.

- Double click in the graphic area to **Set Current Component** back to the top level.
- **Save** the assembly.
- Hit **Rebuild Model**.
- Change this assembly from **Full Detail** Light Rep mode to **Fast Tessellation** mode as we have done before.

By doing so, the Full detail representation (heavy) is unloaded and only the Fast Tessellation (light) is shown. The assembly will be easier to rotate and there will be more free memory .

- Use **Tools** **Info** **Two Entities** to check the distance between two Light Rep Components as shown.

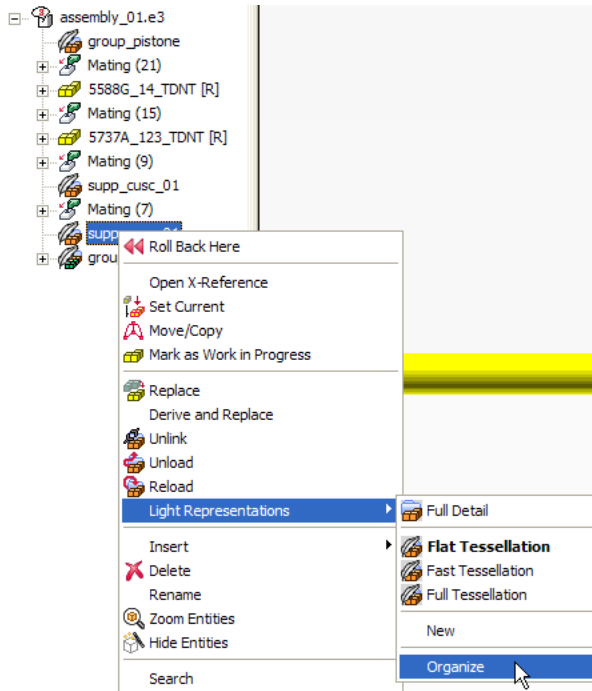


Light Representations can be used on X-Ref Components and these Components can be checked using tools like Measure Distance.

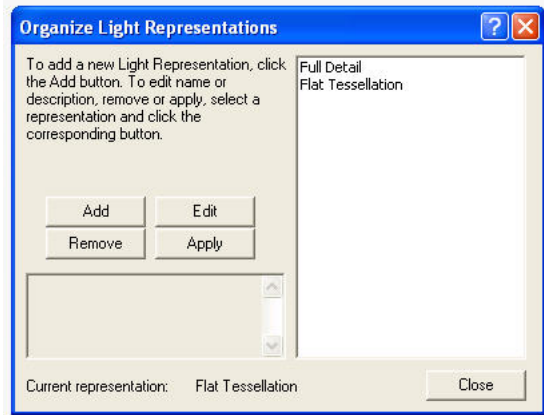
3. Step3 :Organize Light Representations

This step will take you through the procedure of Organizing a set of Light Representations.

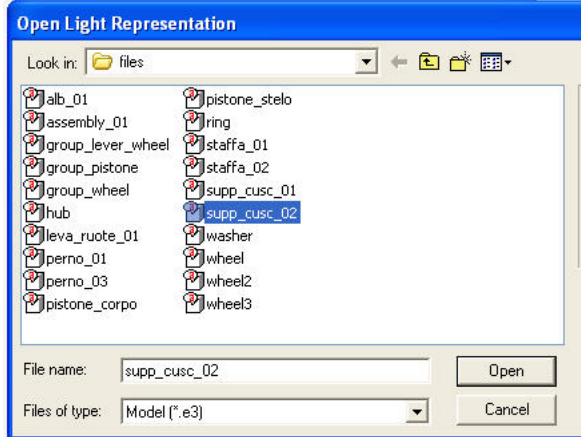
- Right Click on Light Rep component "supp_cusc_01" as shown and go to Light Representation...Organize.



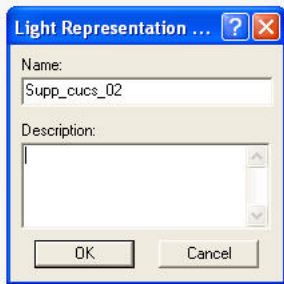
- A list of the Light Representations added previously is shown.



- Click Add to insert another Light Representation of another component on this component .
- Browse and select the Component as shown below.

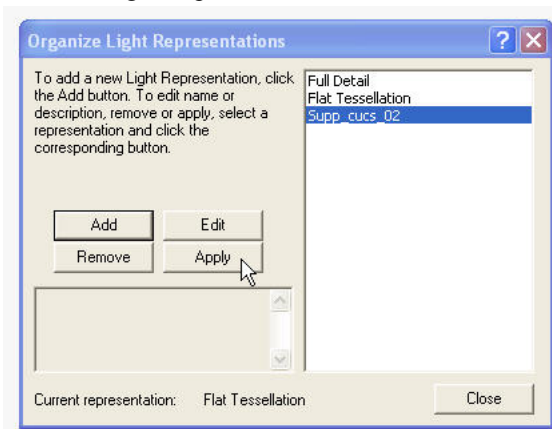


- Hit Open.
- Give the Name and Description of this Light Rep as needed.



- Hit OK.

The new Light Rep is added to the list



- Hit Apply.

Check the History Tree for the difference in the events and see that the original component "supp_cusc_01" (the orange component) is replaced by a Light Representation of component "supp_cusc_02" (the blue component) that was chosen. THESE ARE DIFFERENT COMPONENTS.

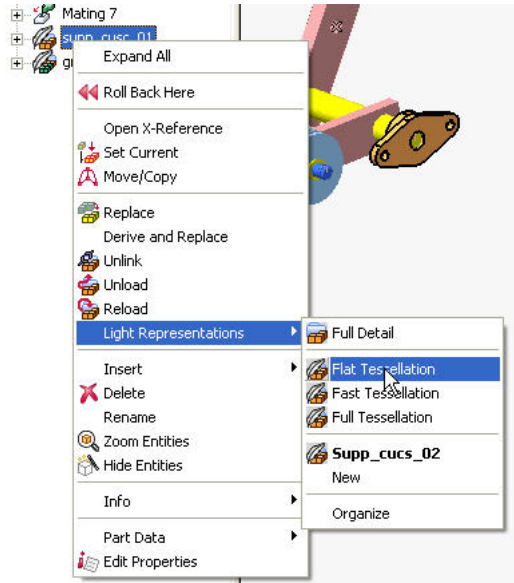
We can add a Light Representation manually. In this manner, we can represent original components with other models (that is, incorporated in the file of original component). This can be useful for two reasons:

- 1) When the original part is heavy (many faces) and the tessellation is always heavy.
- 2) When a part needs to be represented in the assembly but is not yet created and/or finished. The part can be represented in a Light Representation of its "design envelope" only. Using **Symbolic Mating** and Symbolic References, this simplified part can be mated to the top assembly and then switched to **Full Detail** without losing the mating constraints. This is verified, as we can see all the events that make up the simplified component as shown.

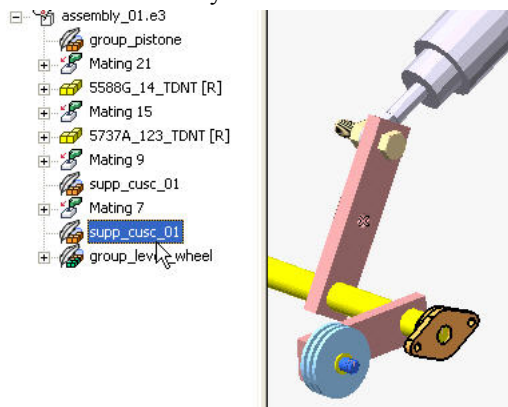


However, the original part and the simplified part (that is, incorporated in the model) aren't linked.

- If needed turn back to **Flat Tessellation** mode as shown.



Examine the History Tree and notice that the model also gets replaced.



This brings us to the end of this task. We are now aware of how Light Representations can help when working with large assemblies.