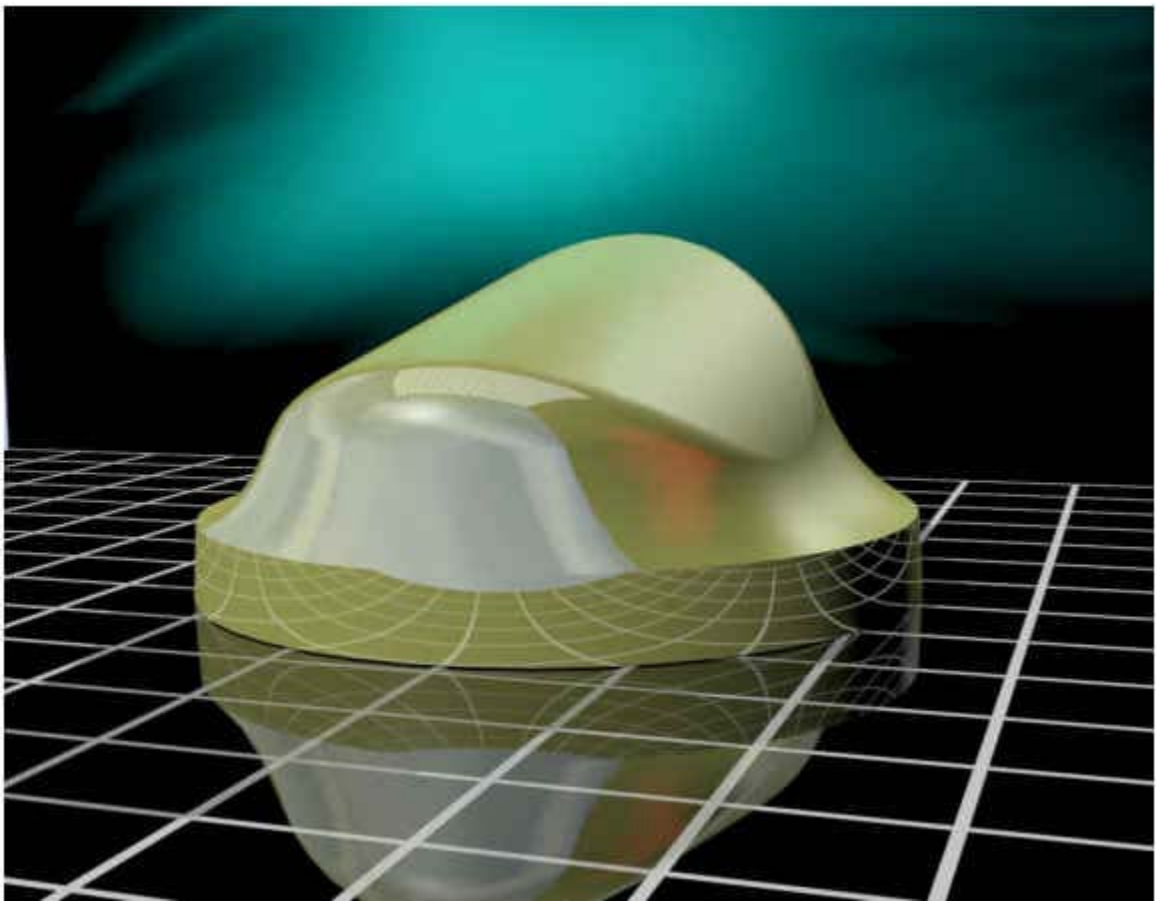
Photorender Tutorial



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So you finally mastered the basic Pro/E functionality! You can build parts, assemblies, and drawings with relative ease. Now you want to make them look really cool! That is where the Photorender functionality can really help. With a little practice, it is easy too! This guide will take you through the basic steps to create a good photorendering of your Pro/E parts and assemblies. It will explain all the major menus, and give a few hints to really make your work stand out from the crowd. You can use any Pro/E part to render in this exercise, or you can download the one pictured in this tutorial (66 KB).

There are some key aspects to creating a great rendering:

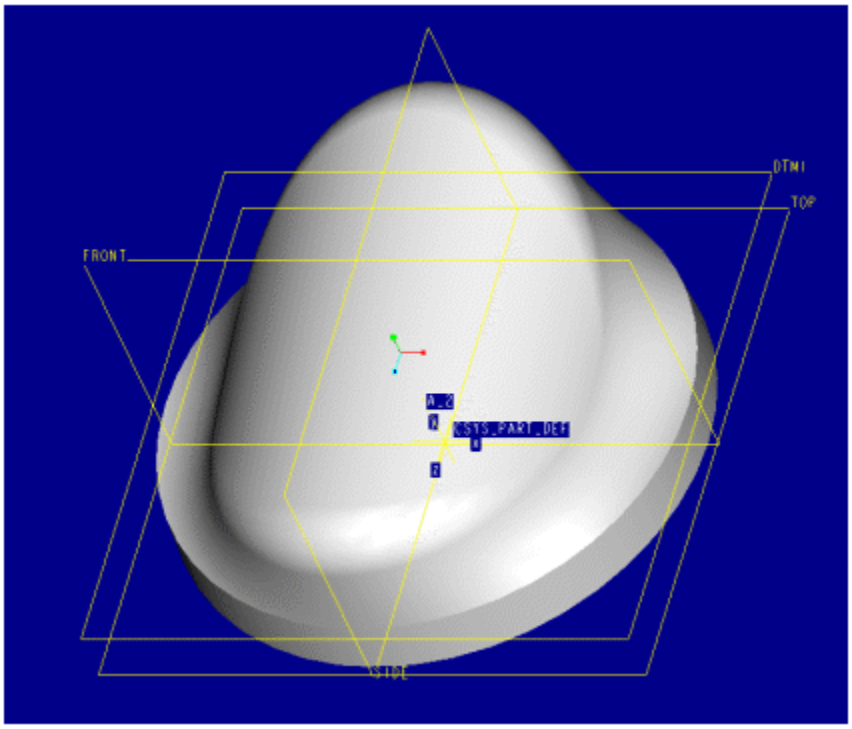
1. Creating the appearances, including some of the advanced functionality.
2. Creating the lights necessary to highlight the objects.
3. Placing the objects in a room.
4. Adding perspective to the objects (*Perspective* distorts the image so it appears as though it is vanishing to a single point).
5. Determining which render options will result in the best image.

All of these topics will be covered in depth in this guide. In order to use the Photorender functionality, your computer must have a graphics card which will support rendering, and you should have the textures (used as walls in the rendered room and applied to part surfaces like wood, etc.)

loaded on your machine. See your system administrator to confirm that both of these issues have been resolved.

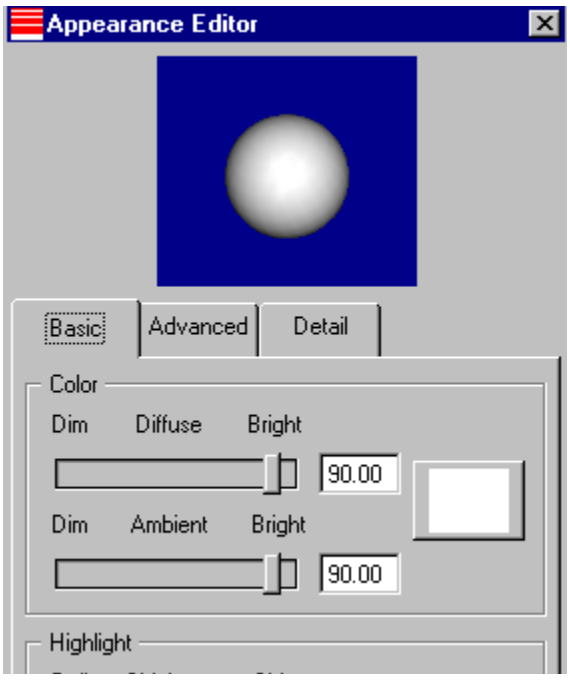
So what is a photorendering? It is an image of an object that has been placed in a photorealistic setting, called a *room*. The room has textures applied to its walls that are used to simulate a desired setting, like a showroom floor.

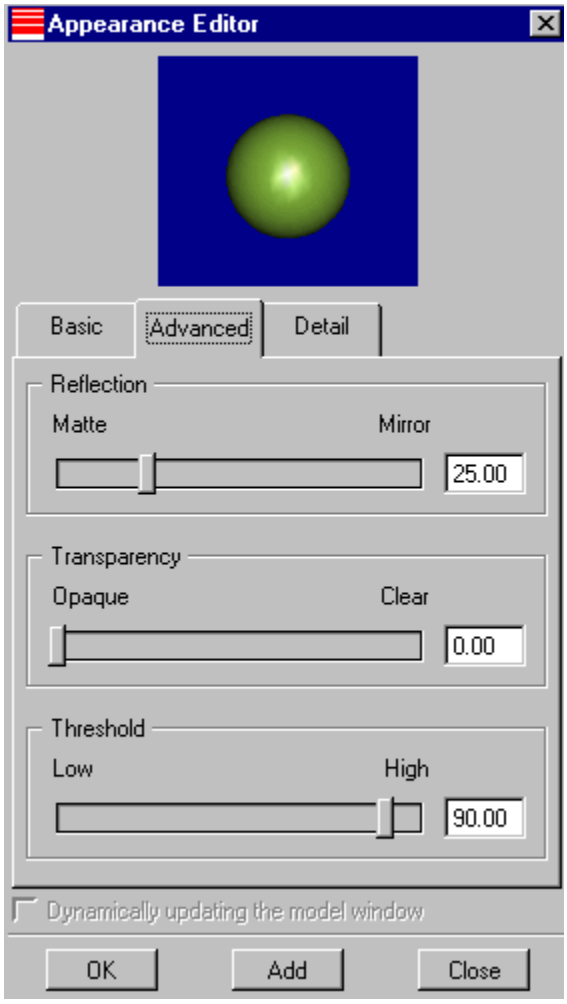
This is the part that will be used to create our rendered image:



Before we begin we need to make sure we have saved a front or side view of the part. This will be used later to easily place the object on the floor of the room. Next, turn off all the datums, curves, spin center, etc. They won't be needed to create the image. Now the colors and appearances need to be defined and added to the object. This is found under View-Model Setup.

This is the appearance editor you are used to seeing. You should already know how to create and modify the basic color settings. We won't change the Highlight settings (to cut down on the complexity). The real fun begins with the other two tabs, "Advanced" and "Detail".

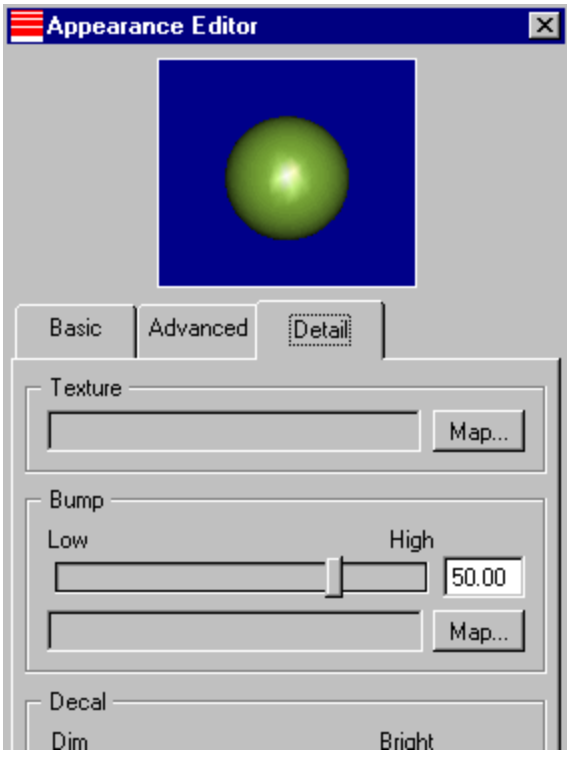




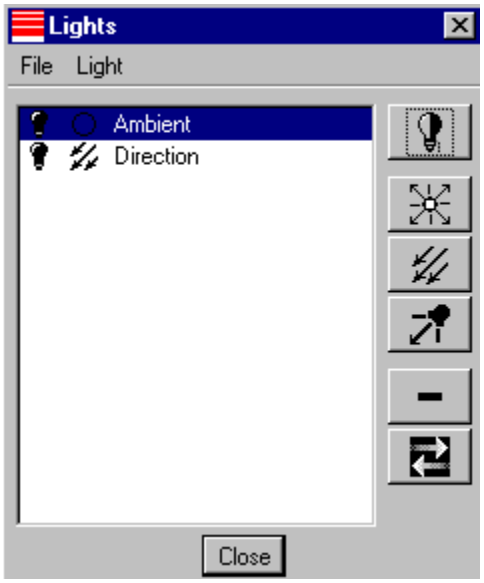
The Advanced tab controls how the lights are reflected off of the object. The Reflection slider controls how the room will be reflected in the rendered image. Unfortunately, this shininess can't be seen until the object is rendered so take the default value for now (this functionality is improved in Revision 21 of Pro/E). The transparency slider works great for windows, cut away views, etc.

The Detail tab allows you to associate a texture (wood, for example), a bump map (orange peel finish), or a decal (a speedometer on a dash) with a color by picking the Map button and navigating to the desired texture. When the color is applied to a surface, the surface takes on the appearance of the texture. Make sure you have turned on the ability to see the textures through the Utilities-Environment-Textures option.

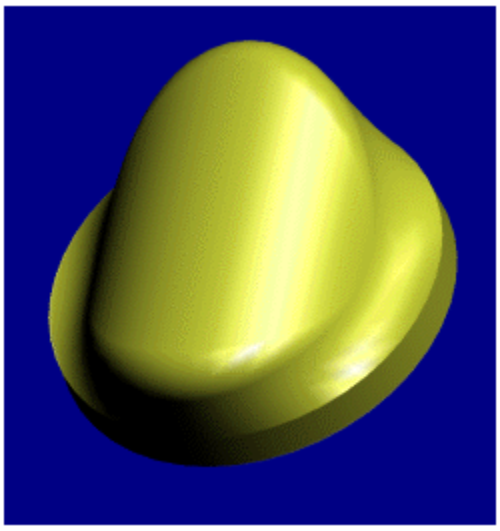
Once the desired appearance is set up and applied, the next step is to set up the lighting.



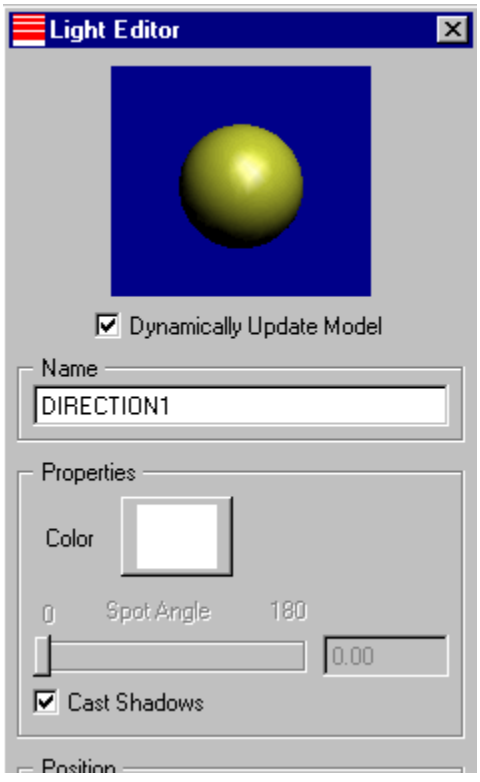
The settings for the lights can be found at the same place as the settings for the Appearances (View-Model Setup). Setting up the lights correctly can change a rendered image from O.K. to spectacular! The lights are what make the image really jump off the screen. How do you know you have set up the lights correctly? That is where your artistic ability comes into play because it is a subjective process. Here are a few tips to get you started:



The first thing to do is turn off the two default lights. Highlight the light in the editor table and hit the toggle button (#1 above). Instead of the default lights use only Directional lights to illuminate the model (pick the button at #2 above to create a Directional light source). Why just Directional lights? They are the easiest to set up and modify. How many light sources do you need? You want to add a light source to illuminate *each interesting surface on the model*. Wherever there is a curved surface or round that looks neat when you move the light source over it should probably have its own light shining on it (I told you it was an artistic process!). Here is an example:



Our part contains a large curved surface and some funky rounds. The first light will try to highlight these features on one side by modifying the Direction sliders on the Light Editor dialog box (see #3 to the right). The result is shown above.



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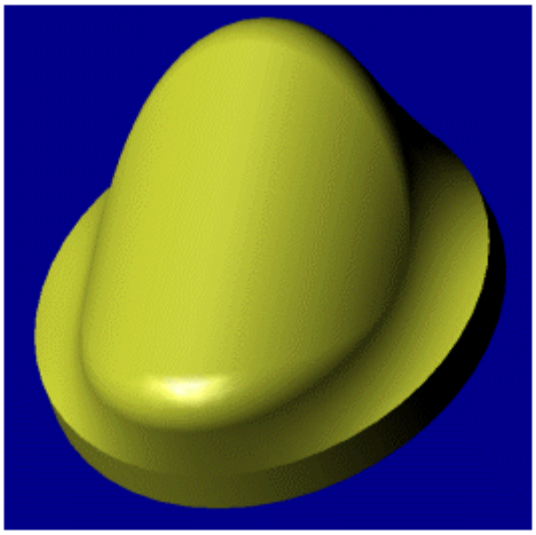
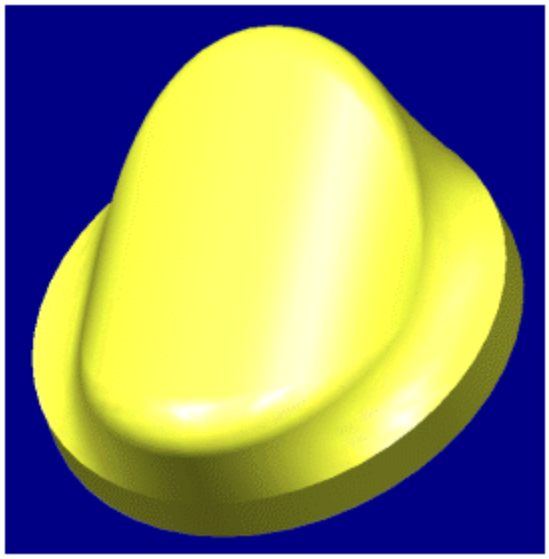
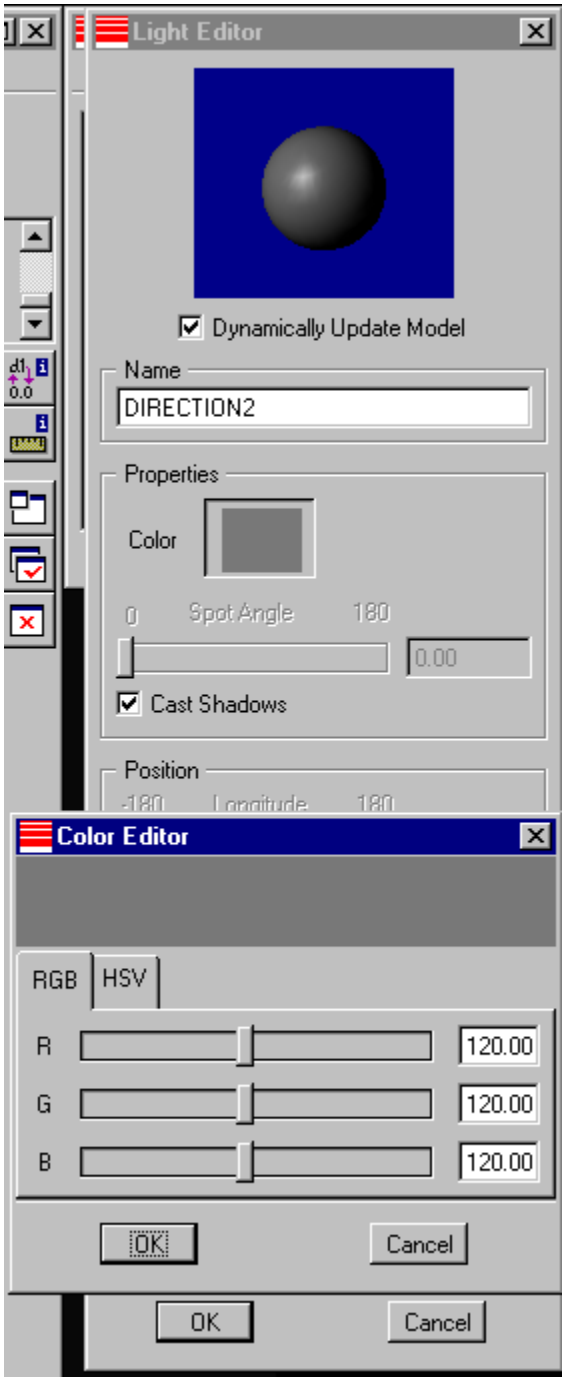
The second light source will highlight the model from the left side, showing off the round on the front of the part.



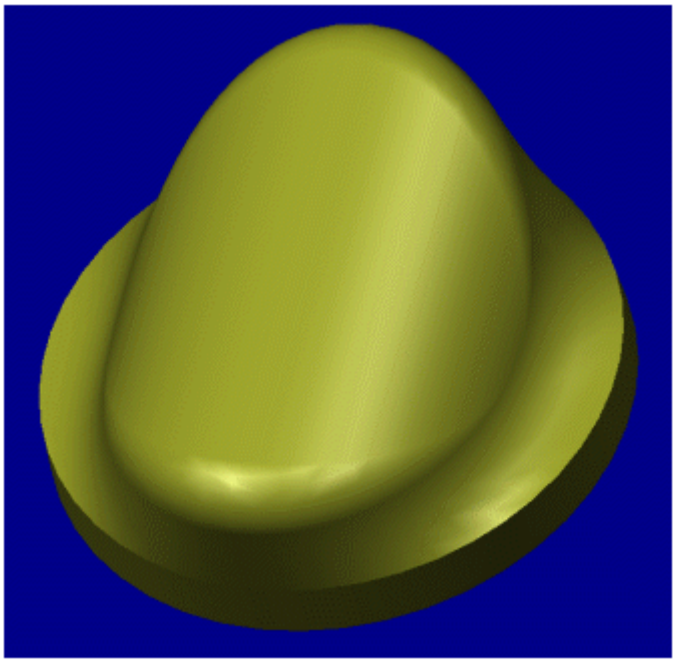
An obvious problem arises when both lights are on the part at the same time. The lights have so much intensity that the part becomes washed out, as seen below:



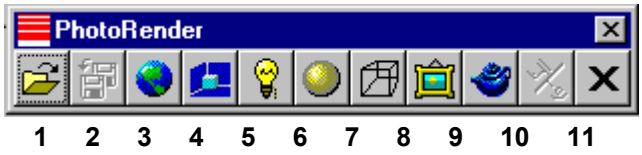
A trick to fix this problem is to change the *color* of the lights. Change the color so that the red, green, and blue values are equal (or slide the "V" slider under the HSV tab). This makes the color darker and the result is that the lights are not as intense on the part.



The result is seen below:



Enough of the preliminaries, now for the fun stuff! The part is ready to be rendered. The Photorender functionality is found in the View-Advanced-Photorender menu. A separate menu pops up which looks like this:



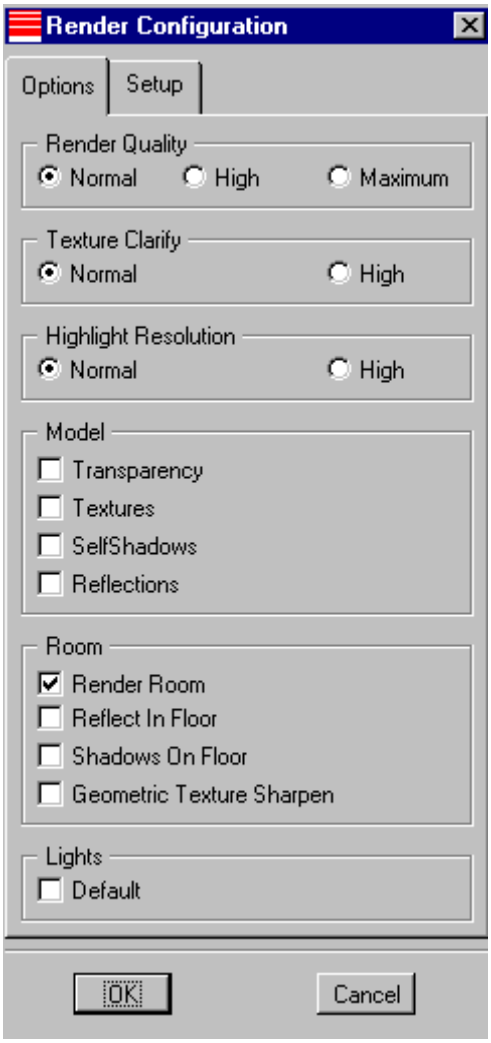
The options are as follows (all will be covered in further detail):

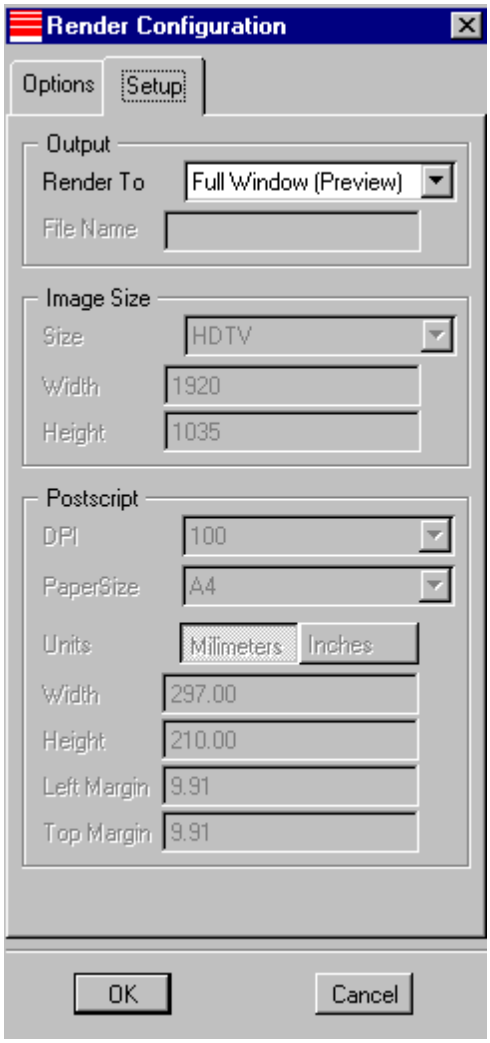
1. Will enable the display of an image file that was previously created. An image file is a format that Pro/E can read and display. More common file formats (TIFF, JPEG, etc) can be created using the Save As button or the Image Editor.
2. The Save As button. Use this button after your image has been created on the screen to save the image to the file format of your choice.
3. The Render Configuration button. This will determine what options will be used to create the image, what quality is used, etc.
4. The Room Editor button. This will be used to set up the size of the room, what textures are displayed on the walls, etc.
5. This button is simply a shortcut to the Light Setup box discussed earlier.
6. Shortcut to the Appearances box.
7. Shortcut to the Perspectives box.
8. This button activates an Image Editor that is built into Pro/E. It can be used to view, crop, resize, etc. any image files, whether created by Pro/E or not.
9. This button starts the Photorender process after everything has been set up.
10. Shuts down the Photorender process (usually not necessary but will free up the memory allocated to the Photorender process without exiting Pro/E).
11. Exits the Photorender menu.

Lets look at the Render Configuration menu first. There are two tabs on the dialog box. The first is the Options tab, where specifications like the quality of the image, clarity, and resolution can be set. Leave these specifications at normal until you have an image configuration you like. The higher the

settings, the longer the rendering process takes, so change these settings as you get closer to your final rendering.

The other checkboxes are for additional functionality such as whether you want the room to be rendered, if you want to see a reflection of the part on the floor, or see shadows created by the part on the floor. Play with these settings until you find an image you like. Remember that as you turn on these options, the rendering time increases!





Some of the best looking renderings occur when only the part is rendered, the room is only reflected in the part. Make sure the default lights option is unchecked; lights have already been set up.

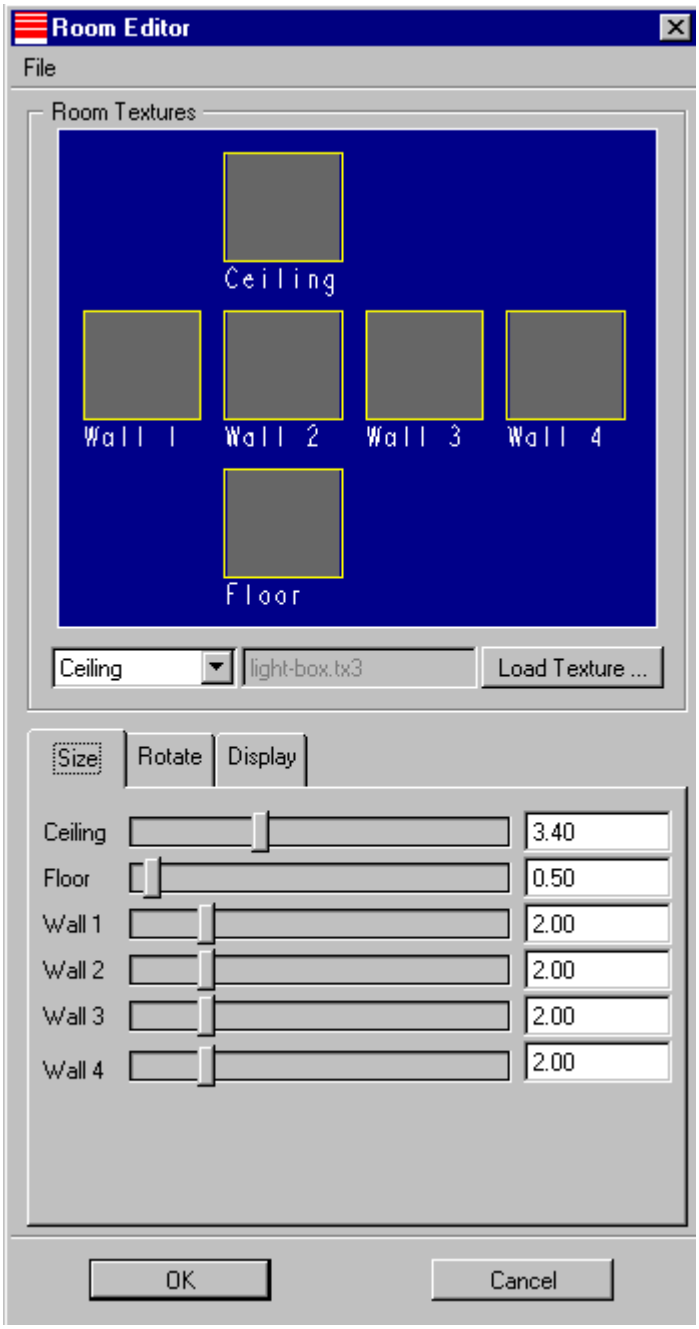
The Setup tab in the Render Configuration box has one main function: to tell Pro/E where to send the image. The only two options you will need will be "Full Window (Preview)" for fast but low quality images and "Full Window" for most images. The other options are for rendering to a file where the size of the image can be controlled. Most images will be stored using the Saved As button.

Now the room can be set up. The Room Editor serves many functions. It enables changes to the size and orientation of the room, and also what textures are displayed on the walls. Let's orient the room first.

When the room first comes up it looks like this:

Remember that the model and the room can have different orientations. The goal will be to orient the part so that it has the same orientation as the room, place the part on the floor of the room, and lock the room to the part so when the part is spun the room spins also.

Exit the Photorender functionality so that the part can be oriented to the view that was saved earlier. Reenter the Photorender functionality and enable the Room Editor. Adjust the slider for the Floor (see #4) until the part looks like it is sitting on the floor of the room (you may also directly enter the values next to the slider to raise or lower the floor).



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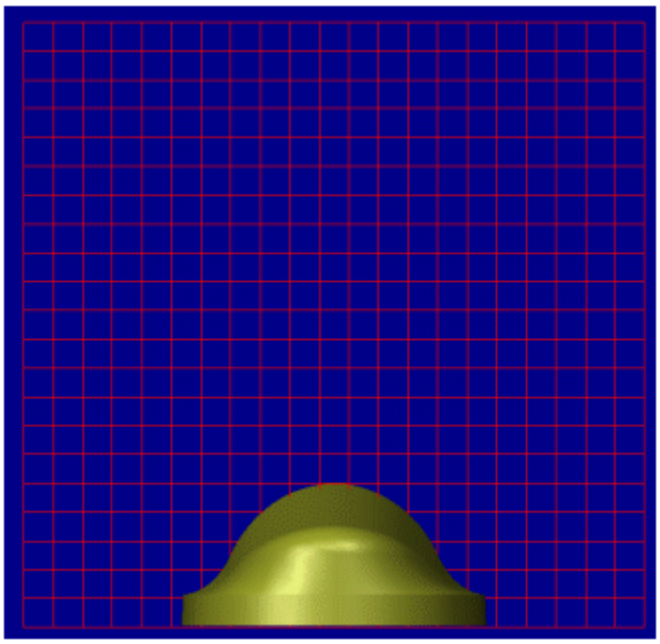
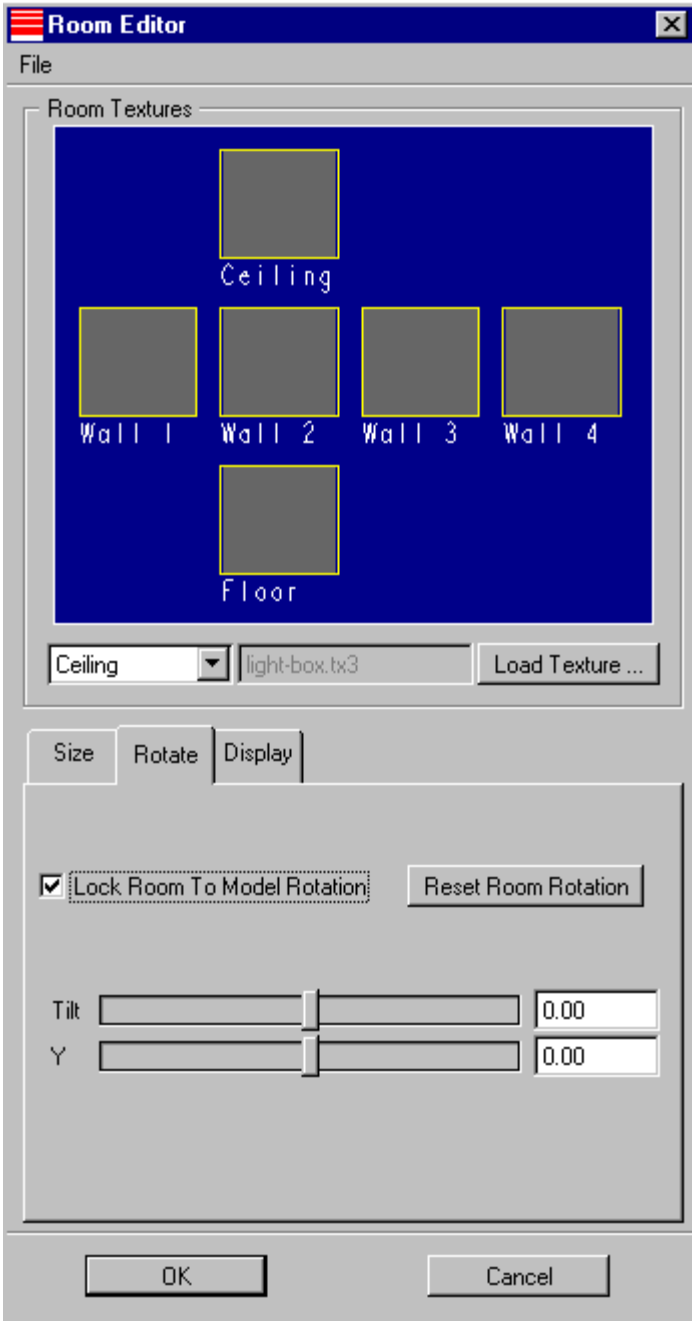
The result should be:



Pick the Rotation tab on the editor box and check the Lock to Model Rotation option. This will allow the part and room to spin together so that the image can be easily oriented. The Display tab can be used to show the room in a shaded mode for easier visualization (see below) or change the grid density on the walls.


Room Editor
File
Room Textures
Ceiling
Wall 1
Wall 2
Wall 3
Wall 4
Floor
Ceiling
light-box.tx3
Load Texture ...
Size
Rotate
Display
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Tilt
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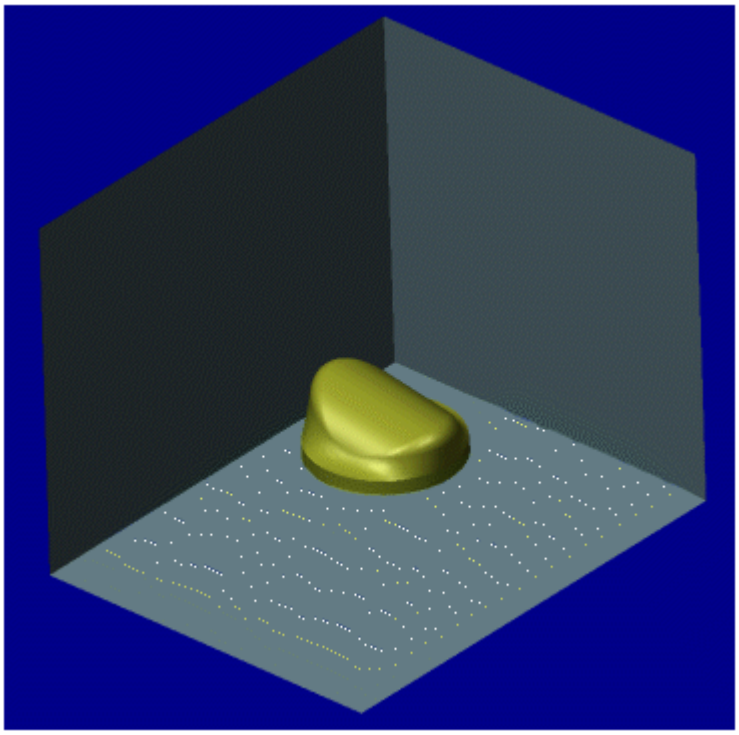
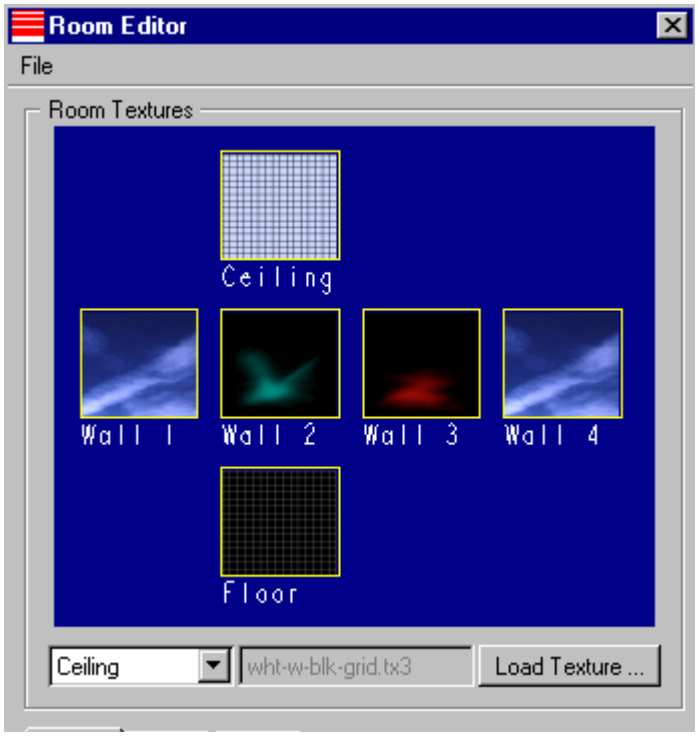


The size of the room is somewhat subjective. Its size should be such that it is larger than the part but still be somewhat square so that the wall textures are not distorted when the image is created. Orient the part to a nice isometric view and zoom in close enough so that the edges of the room cannot be seen. Make the room larger or smaller if necessary. You may also need to adjust the light locations.

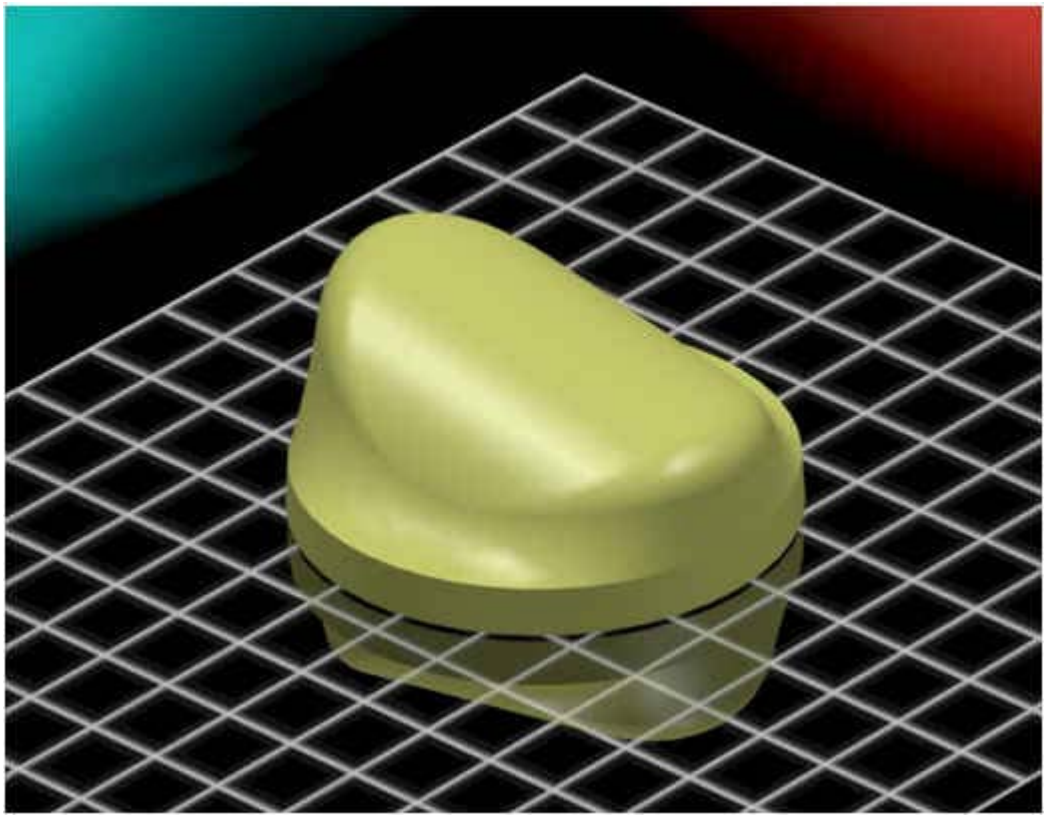
The textures for the walls can now be added. In the room editor pick on the gray box above the name of each wall that needs to have a texture added. Navigate to the load point of the texture library and pick the desired texture. Continue until all the walls are filled:



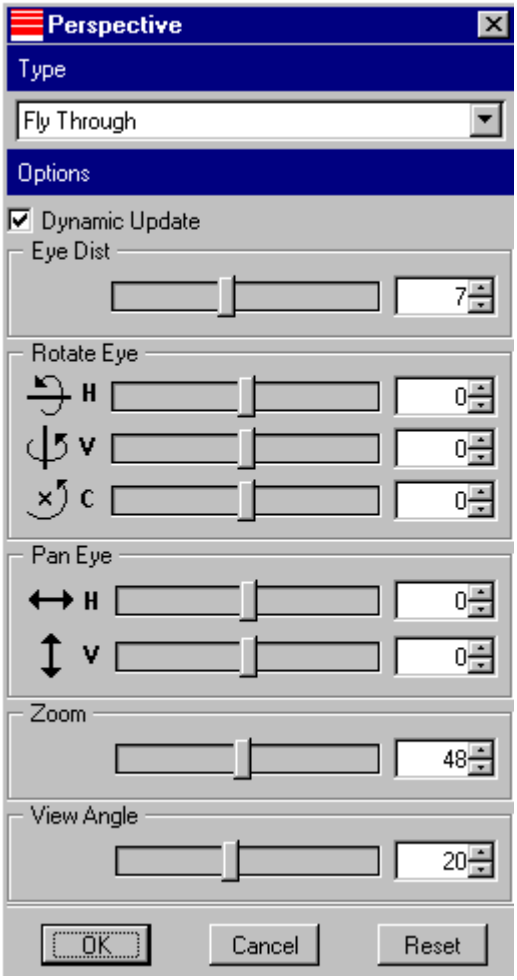
Remember that even if a wall can't be seen in the orientation you have chosen, a *reflection* of the wall may show up on the part (one of the options in the Render Configuration menu is Reflections).

After adjusting the room, do any last minute tweaking (zoom in or out, adjust the lights and colors, etc) and pick the Photorender button (shaped like a teapot).

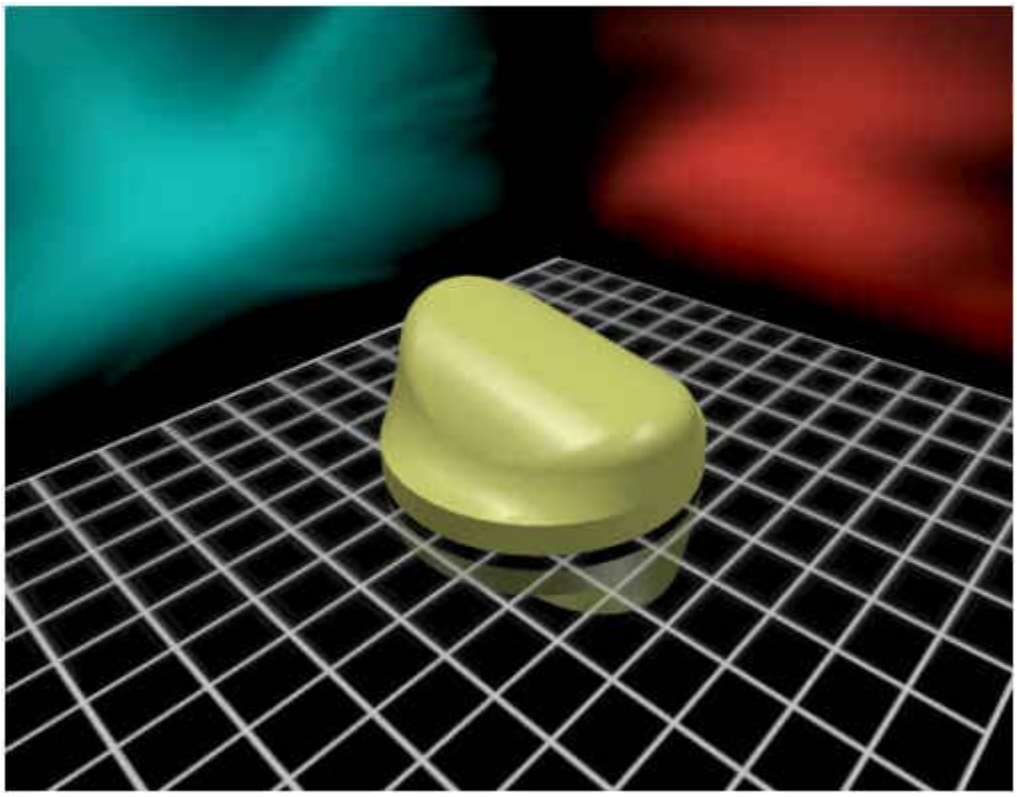
Drum roll, please!



This is the result of our first effort. To make the image more realistic, perspective can be used. Pick the Perspective button. This will distort the room and part, but will make the image look much more realistic. Adjust the amount of perspective by using the Eye Distance slider (see below). Don't use too much perspective or the result will look too distorted!

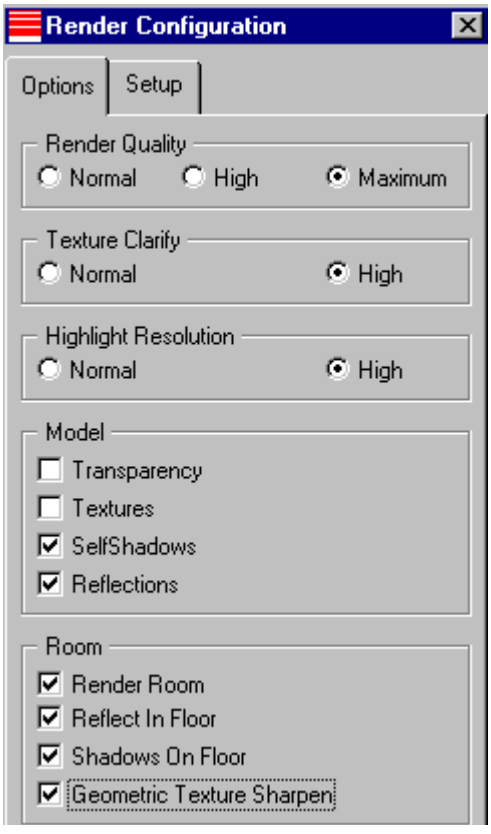


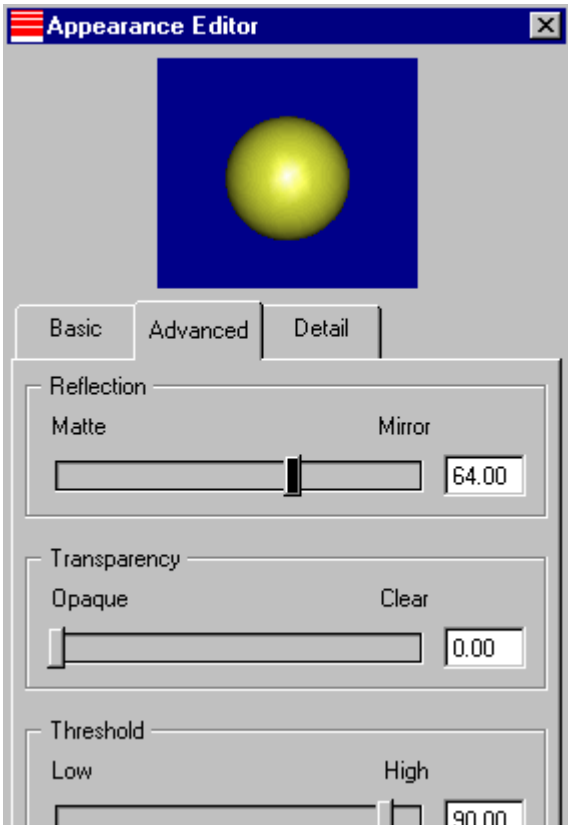
After adjusting the amount of distortion, tweak the room orientation again and hit the teapot.



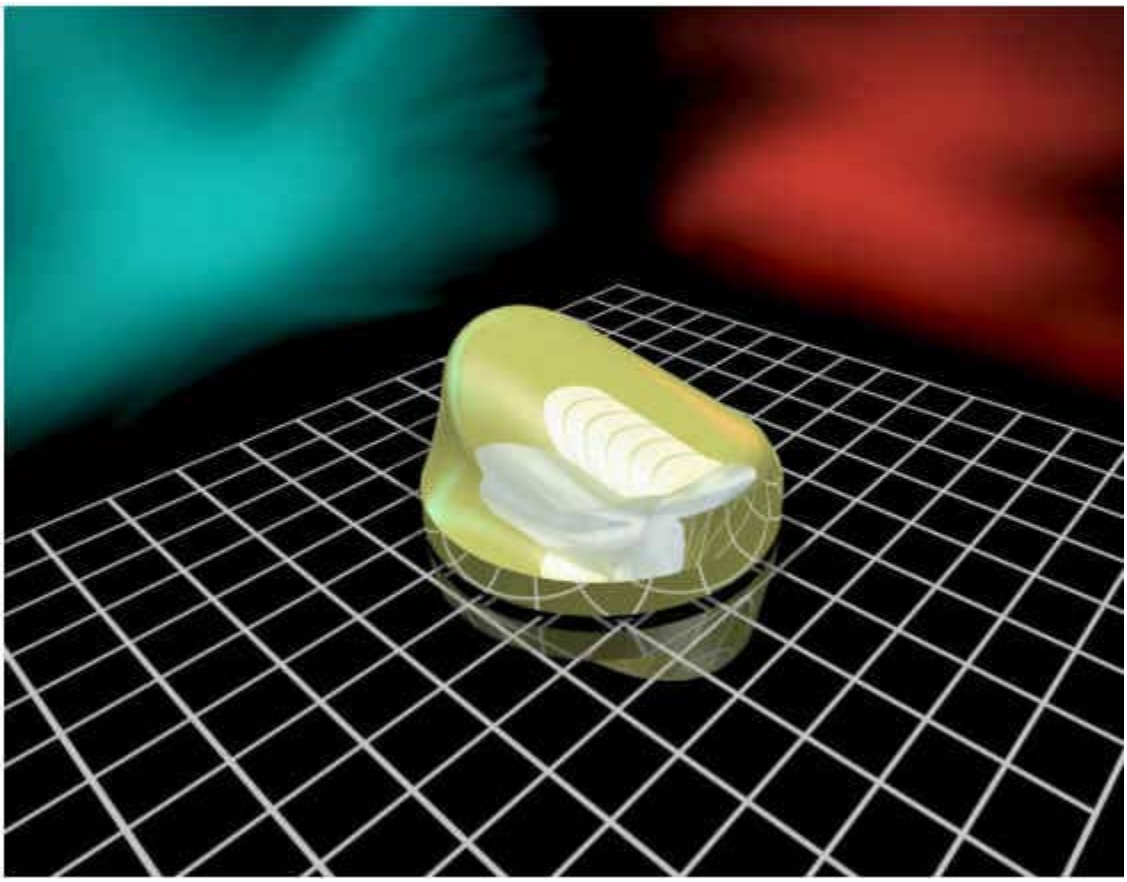
Starting to look better, eh?

For the last image turn on most of the options in the Render Configuration box and make the color more reflective:





The final image:



Another orientation can be seen at the beginning of this guide.

Now for some **TIPS!**

Photorendering assemblies will take much longer than parts. Each p; Each part is rendered individually in the assembly. To reduce this time, reduce the number of parts. Create a view in Pro/E with the approximate orientation that you will use in the rendered image. Create a Simplified Representation with only the parts that can be **seen** in that orientation.

Another way to reduce the render time for assemblies is to create a surface feature in the assembly that envelops the outer boundary of the assembly. Place this surface on a simplified rep by itself. Use this rep to set up the room, lights, options, etc. Rendering this surface will be much quicker than rendering the full assembly will. Switch to the simplified rep of the assembly with the unseen parts removed and render for the final image.

If you have created colors, lights, and room configurations that you would like to use again, you can save that information to disk (use the File pick in the necessary dialog box).

Use the "Full Window (Preview)" option for fast renderings. The image will be fuzzy but you can get a quick look at your room setup, etc. Change to "Full Window" as you get closer to your final image.

Remember that there are many combinations of colors, options, lights, and orientations that can be used to create an image. The process of creating a rendering is very subjective. Think of yourself as a photographer, and play with the settings until something looks good to you. Good luck!