Bringing Your Ideas to Life: Creating Photorealistic Renderings Using AutoCAD® 2013

Jeff Bartels
Sr. Application Engineer – Seiler Instrument & Mfg.

Class Summary

In this class you will explore the essential tools and workflow necessary to produce a photorealistic rendering from a 3D AutoCAD® model.

Learning Objectives

At the end of this class, you will be able to:

- Create & save a 3D perspective view
- Illuminate a scene using both natural & artificial light
- Navigate the Materials Browser to search / select / apply materials
- Customize stock materials or create your own
- Control how materials are mapped to objects
- Create high resolution images of a 3D model

Jeff Bartels

Background…

- Using AutoCAD professionally since Rel. 12
- Served 10 years as CAD manager
- AutoCAD instructor for nearly 15 years
- Produced 19 AutoCAD training titles for lynda.com
- AUGI member
- Sr. Application Engineer for Seiler Instrument & Mfg.

My Approach for this Session…

I will be focusing on the “need to know” tools for creating renderings

We will be creating renderings for several small projects

- Skills learned can easily be applied to larger projects
- Each project will reference concepts from the prior one

This class will be presented using a “training” approach

- Discussing “how” & “why”
- Student will be able to put skills to work immediately
- Don’t worry about taking notes!!

Exercise #2 - Selecting & Applying Photorealistic Materials

Open 02_interior_natural_light.dwg

Learning goals: Navigate the Materials Browser to select photorealistic materials. Apply materials to model components. Customize basic material properties.

This exercise is meant to build on the previous example. In this case we'll be rendering an interior scene using natural sunlight. We'll also talk about selecting and applying materials to the objects.

Step 1. Zoom out such that you can see the entire model. Then turn on Sunlight, and Sky Background & Illumination. Render the drawing when finished.

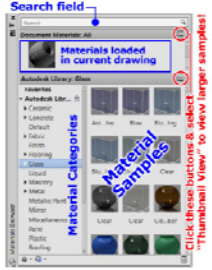
Note the sunlight is creating a large shadow that covers most of the room.
At this point, the rendering is rather "bland" because the components are being rendered using the layer colors.

To add more life to the image we'll select some of AutoCAD's photorealistic materials from the Materials Browser.

Step 2. Open the Materials Browser.
(On the Render Tab, click the "Materials Browser" icon inside the Materials panel.)

The Materials Browser is where we go "shopping" for photorealistic materials. There are thousands to choose from, nicely organized on this single palette.

Click the "Add" icon on a sample to load it into the drawing. If desired, selecting a category in the left panel will narrow the display of samples.
Still can't find what you need? Use the search field at the top. Simply enter keywords to see all materials associated with those words. Try it! – Get a feel for the tool by selecting some of the categories. Try using keywords like: BRICK, or WOOD, and note how it affects the samples.

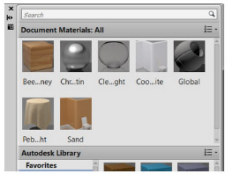


Tip: Right-click on materials loaded in the drawing and select Delete to remove them. Purge works too!

For this rendering we need to select some materials.

Step 3. Load the following materials into the drawing…
"Beechwood – Honey" *(for the floor)*
"Chrome – Satin" *(for the chair frame)*
"Glass Clear – Light" *(for the window panes)*
"Cool White" *(for the wall and window trim)*
"Pebbled – Light Brown" *(for the chair fabric)*
"Sand" *(for the wall paint)*

When finished, the Document Materials area of the Browser will look similar to this…



The next thing we need to do is assign these materials to objects in the drawing. There are essentially two ways to do this. The first method we'll use is drag and drop.

Step 4. Click hold and drag the Beechwood material from the Browser and release it over the floor.

Step 5. Drag and drop the Sand material from the Browser and release it over the wall.

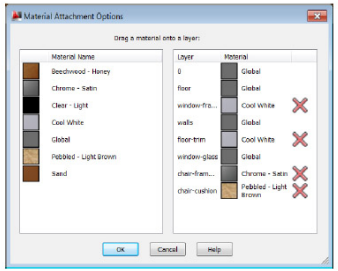
Note how easy it is to apply materials to the components in a model.

Step 6. Use the same drag and drop technique to apply the Glass material to each window pane.

As you can see, the drag and drop method works nicely, but it could be tedious if you are working with several small parts. Next we'll look at how to assign a material to ALL objects on a specific layer. We'll use the "Attach by Layer" tool to do this.

Step 7. In the Ribbon, expand the Materials panel *(click the small triangle)* **and select "Attach by Layer".**

This will open the Material Attachment Options dialog box as displayed below.



Using this tool, simply drag and drop a material from the left, and place it on the layer of your choice.
(You've probably already guessed that if you click the red X you can remove a material from a layer.)

Step 8. Assign the remaining materials to the appropriate layers.
(Use the image at left as a guide)

When finished, restore the view called "final".
(Ensure that the Sunlight, and Sky Background and Illumination are still toggled on.)

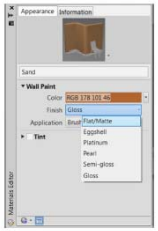
Step 9. Render the drawing – The result will look similar to the example on the next page…

As you can see, materials make a big difference in the quality of a rendered image.

There is one more thing we should do before wrapping up this exercise. Notice that the walls have an overly "glossy" appearance. To tone this down we need to make a simple adjustment to the Sand material.

Step 10. In the Materials Browser, click the "Edit" button on the Sand material to open it in the Materials Editor.

(Note: Double-clicking a material will also open the Materials Editor.)



Since this material represents wall paint, the settings are associated with real world wall paint properties.

Step 11. Assign a Flat/Matte finish to the paint, and lighten it's color a little by changing it to 178,101,46.

Close the Materials Editor when finished and render the drawing a final time

Feel free to keep going! Try new materials or colors. Play with the angle of the sunlight. See if you can create a more interesting view.

After completing this exercise, you can …

- Navigate the Materials Browser to select photorealistic materials
- Apply materials to model components
- Customize basic material properties

Using the Sun & Sky to Illuminate a Scene

Sun at 12:00 pm

Sun at 5:00 pm

In this lesson we learned how to:

- Create & Save a 3D perspective view
- Add sunlight to a rendering
- Customize settings related to the Sun & Sky

Selecting & Applying Photorealistic Materials

Before materials

After materials

In this lesson we learned how to:

- Navigate the Materials Browser to select photorealistic materials
- Apply materials to model components
- Customize basic material properties

Using Artificial Lighting to Illuminate a Scene

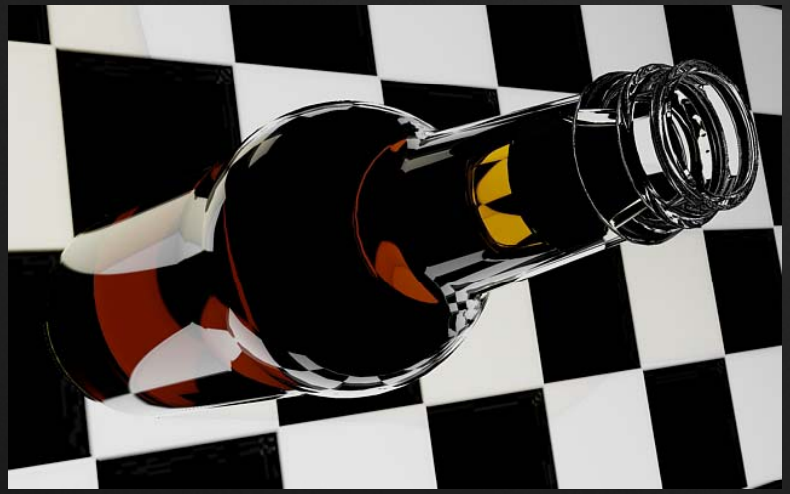
Default lighting

Photometric lighting

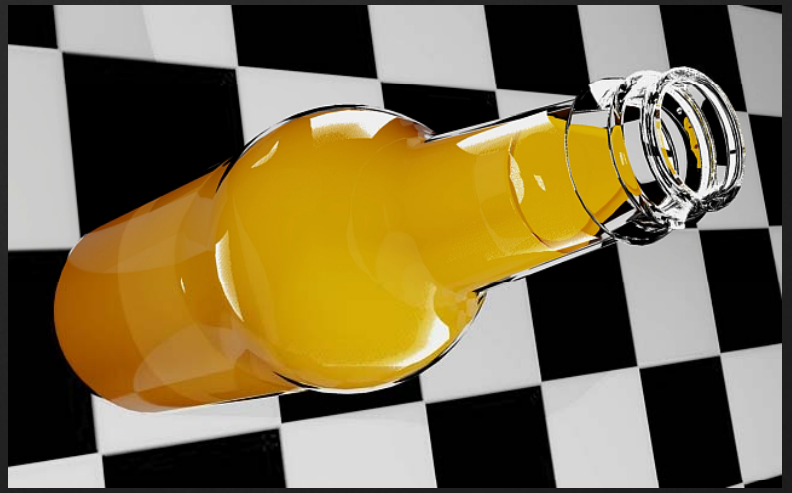
In this lesson we learned how to:

- Illuminate a drawing using point lights
- Create soft cast shadows
- Select & edit light sources using the Light List dialog box

Customizing Materials to Improve Appearance



Default material settings

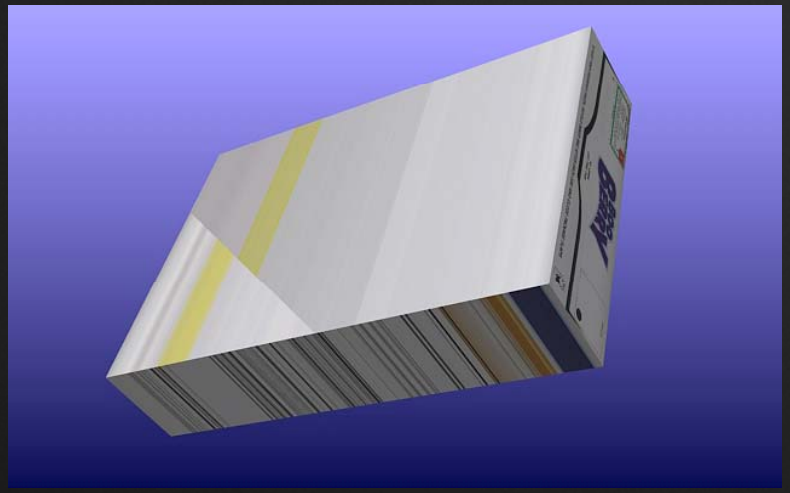


Customized material settings

In this lesson we learned how to:

- Customize material properties
- Create new materials from scratch
- Utilize a background to add interest to glossy materials

Mapping Materials to Planar Faces



Default planar mapping

Corrected planar mapping

In this lesson we learned how to:

- Create materials using images
- Apply materials to specific faces using the CTRL key
- Adjust planar mapping using the MATERIALMAP tool

Mapping Materials Cylindrically

Default cylindrical mapping

Corrected cylindrical mapping

In this lesson we learned how to:

- Properly scale cylindrically mapped materials (Width = 1)
- Control materials applied to rotated cylinders

Strategically Placing Materials Using IMPRINT

Original

After using IMPRINT

In this lesson we learned how to:

- Create custom faces using IMPRINT
- Adjust the resolution of a rendered image
- Save rendered images to disk

Learning Objectives

After finishing this class you can:

- Create & save a 3D perspective view
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- Control how materials are mapped to objects
- Create high resolution images of a 3D model

Contact Information…

Jeff Bartels – jbartels@realworldcad.com

Twitter - @JeffBartels

Blog – http://seilercadsupport.wordpress.com

Drawings used in this presentation…

http://tinyurl.com/AC1603JB