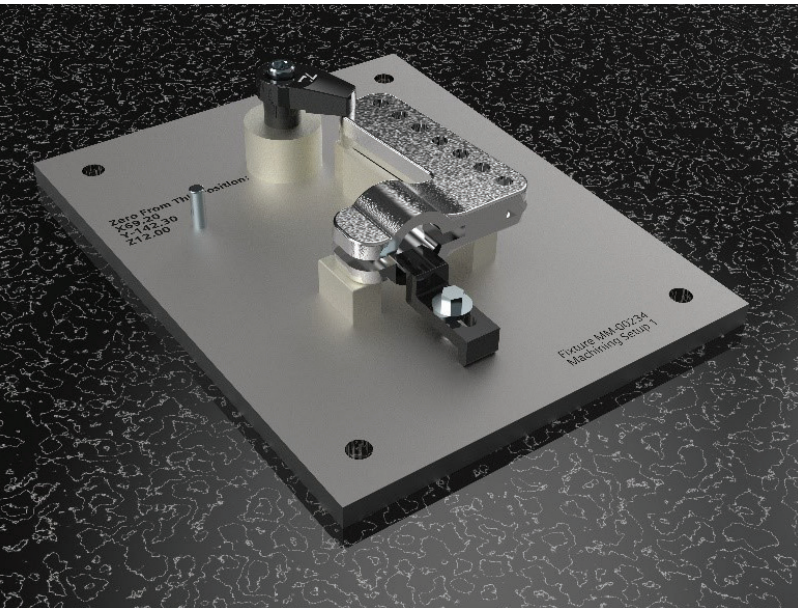SIEMENS
Ingenuity for life

Siemens Digital Industries Software

Seven tips for better rendering

Quick ways to increase the realism of your 3D renders and make your models shine

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Seven tips for better rendering

A rendered model is more than just a pretty picture; rendering images is a good way to communicate a new design – both internally and to the public. A photorealistic image can help you communicate your design to both internal and external stakeholders, get feedback on your product before going through the expense of a physical prototype, and even generate interest, demand and sales.

In this eBook, we'll give you seven tips that you can put into practice to improve the realism of your rendered models.

Tip one: Place your virtual product in a real environment

A realistic background helps viewers picture your model in real life, ready to be used. The more realistic the background, the more convincing the overall picture. And the most realistic background is a real background – a picture of an environment where your product might exist. To create realism in your overall image, use your own custom image for the background of your rendering.
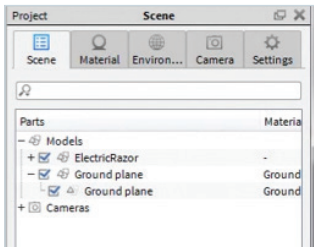

Image courtesy of Supfina.

Image courtesy MasterMover.

Image courtesy of TrIby.

Tip two: Think about the ground

You have a realistic model, placed in a realistic environment, but don't forget to think about the impact of model and environment on each other. Is the surface your model is sitting on hard, or soft? A soft or wet surface needs to react to your product in a realistic way. Take, for example, this razor model, which has been placed on a set of towels to create realism. Because we know towels are soft, the razor really needs to appear as though it is sinking into the material rather than just sitting on top. To create this effect, add a ground plane, and clip your geometry below the physical plane. This creates the illusion that the razor is being buried in the soft material.

Tip three: Soften your edges

You can see the impact of edge blends in these two images.

The foundation for a great render is the geometry itself. What do we mean by exceptional geometry? It's all about the details, and more details...and even more details.

A simple trick for heavily increasing the visual impact of your geometry is adding edge blends to all the sharp edges of your design. The exception would be edges that are *intended* to be sharp, such as knife edges or glass corners. In best-in-class product development systems like Solid Edge™ software, you can make this process faster by setting the radius value and letting the rendering tool add the detail.

Tip four: Add component air or geometry gaps

Another visual booster is achieved by adding gaps in your geometry. While this isn't preferable for engineered models, it boosts the impact of the rendered model. A small gap emphasizes shadow effects in that area, as seen in this example.

The edge blend added to the right image makes it seem like there is a tiny gap and creates the illusion of multiple parts.

Tip five: Don't be afraid to add some bumps

Material textures are easy to overlook, but they play an important role in making your rendered images look photorealistic.

Even seemingly smooth surfaces generally have texture. Look closely at this photo of paint on a car body – you can see from the jagged reflections that it has very subtle bumps on its surface.

Start looking closely at your materials and consider adding bump maps and roughness to even your glossy parts.

In the piano model next, the images have been rendered with and without bump maps and roughness. You can see that the added textures greatly enhance the realism of the materials. Remember, a little texture goes a long way.
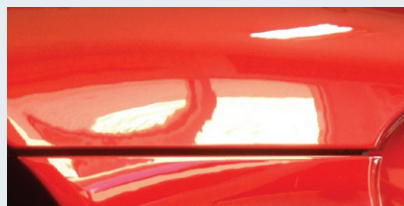
Even car paint has a certain level of texture (this is not a rendered image).

No bump map added.

Bump map (scale=0.9, height = 0.015, roughness = 0.001).

Tip six: Add depth of field...but not too much

Depth of field (DOF) can increase the photorealism of a render and give a dramatic effect to your images. A shorter depth of field means that the objects close to the target area are in focus, while objects outside of the target are out of focus or blurred, creating depth, complexity and a clear focal point in your image.

Depth of field is controlled through the f-stop – as the f-stop value gets smaller, the virtual lens opening gets larger, and the depth of field, or region that is in focus, decreases, blurring more of your background.

A word of caution: using too much depth of field can obscure much of your object, which can be problematic in some situations.
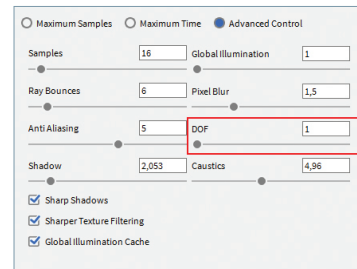

A short depth of field creates focus on a single plane of the image.

Tip seven: Light it up

Lighting not only has a practical purpose – illuminating your object so that it can be seen – it also adds realism and mood to your rendered scene. Lighting environments in your rendering tool can offer a variety of options – and adding perspective to your model can help lighting look more realistic.

You can also add internal lights from different natural and manmade light sources in your scene, to add additional realism or effect.
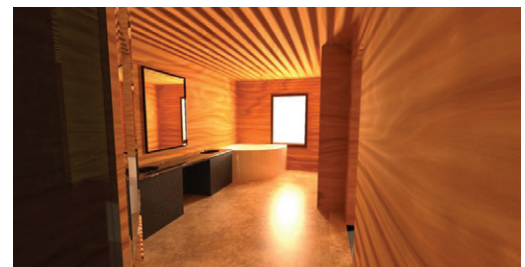
Adding light sources to the windows to replicate sunlight adds realism to the scene.

Rendering in Solid Edge

Solid Edge: Everything you need to bring your vision to life
Solid Edge is a portfolio of product development tools: mechanical and electrical design, simulation, manufacturing, technical publications, data management and more. Solid Edge combines the speed and simplicity of direct modeling with the flexibility and control of parametric design – made possible with synchronous technology.

Rendering in Solid Edge
The built-in rendering capabilities of Solid Edge allow you to create photorealistic images and animations from within the modeling environment. Integrated explode, render and animation capabilities, combined with motion simulation, add realism to your models and allow you to clearly communicate your vision for a final product.

Rendering capabilities of Solid Edge include:

- **Drag-and-drop editing of materials, lighting and environments**
  Solid Edge makes 3D rendering easy – you can change materials, lighting and environments by simply dragging and dropping from a huge library of optional materials, colors, lighting schemes, and backgrounds.

- **Save preferences for easy referencing**
  Save your favorite colors, materials and lighting into a custom folder for quick and easy access. These materials may be company standards, or just your personal preferences.

- **Create unmatched photorealism with out-of-the-box settings**
  Add perspective to boost realism in photo-quality images for marketing and packaging, with out-of-the-box lighting schemes and matching environments for indoors, outdoors and studios.

- **Use custom backgrounds to frame your products**
  Use your own custom background image to place your virtual product in a realistic environment – for example, in a consumer's home, on your shop floor or in an artistic setting of your choice.

Learn more, or try it for free
Learn more about rendering in Solid Edge: *siemens.com/plm/rendering*

Try rendering and all the amazing capabilities in Solid Edge, for free: *siemens.com/plm/try-solid-edge*

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Siemens Digital Industries Software, a business unit of
Siemens Digital Industries, is a leading global provider of
software solutions to drive the digital transformation of
industry, creating new opportunities for manufacturers
to realize innovation. With headquarters in Plano, Texas,
and over 140,000 customers worldwide, we work with
companies of all sizes to transform the way ideas come
to life, the way products are realized, and the way
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