European Journal of Innovation in Nonformal Education (EJINE)
Volume 2 | Issue 6 | ISSN: 2795-8612

Realism with the ArchiCAD Material Editor

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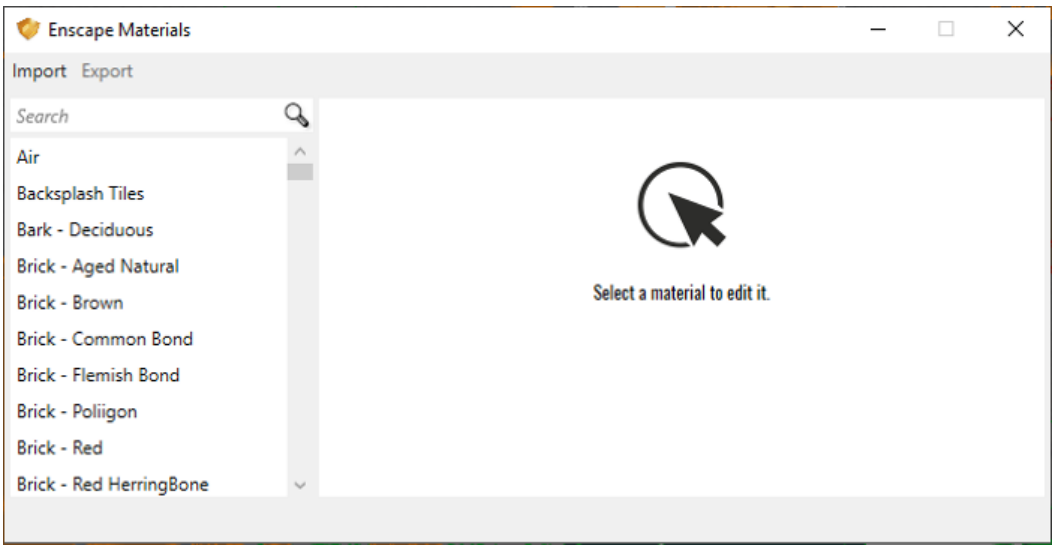
A B S T R A C T
The course of building drawing at the university is aimed at the formation of the graphic culture of students, as well as the creative potential of the personality. Most effective work in this area, especially in teaching construction drawing, is achieved through the use of modern graphics software. Among the graphics programs in the field of architecture in the field of architecture, ArchiCAD is the most advanced, which is an effective way to illustrate the day of a subject by transitioning to a threedimensional state of drawings in the eyes of students. Therefore, the practical significance of graphic programs and their descriptions occupy a special place in the coverage of the whole essence of this science.

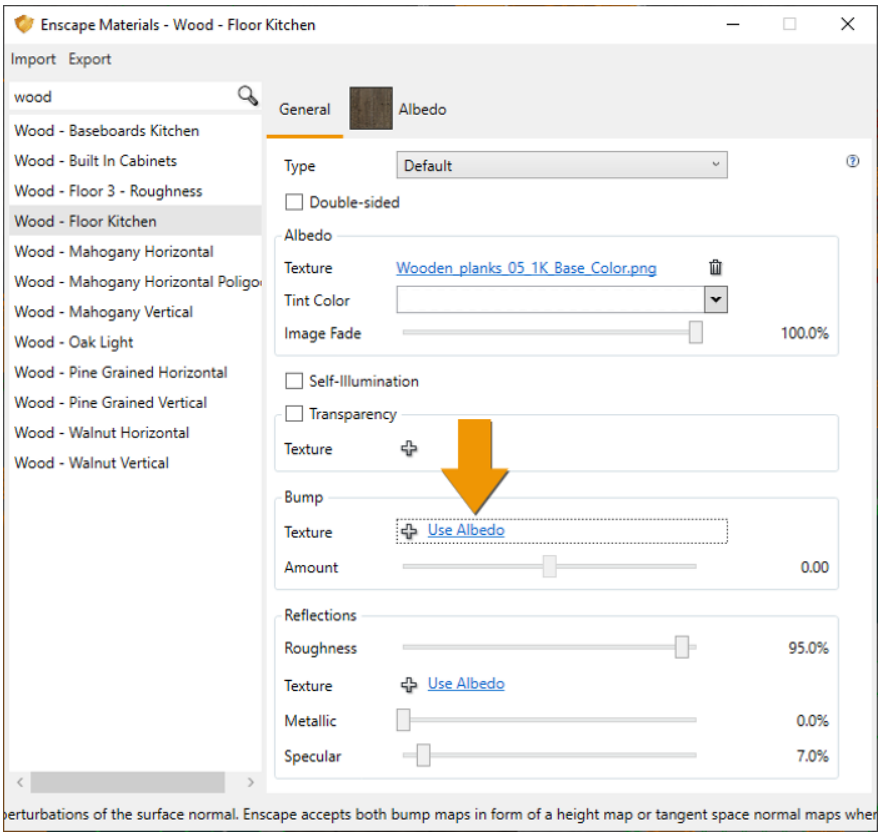
A R T I C L E I N F O
Article history:
Received 05 April 2022
Received in revised form
03 May 2022
Accepted 14 Jun 2022

Keywords: graphic education, construction drawing, graphic applications, graphics, information and communication, spatial imagination, architecture, drawing, didactics, engineering graphics.

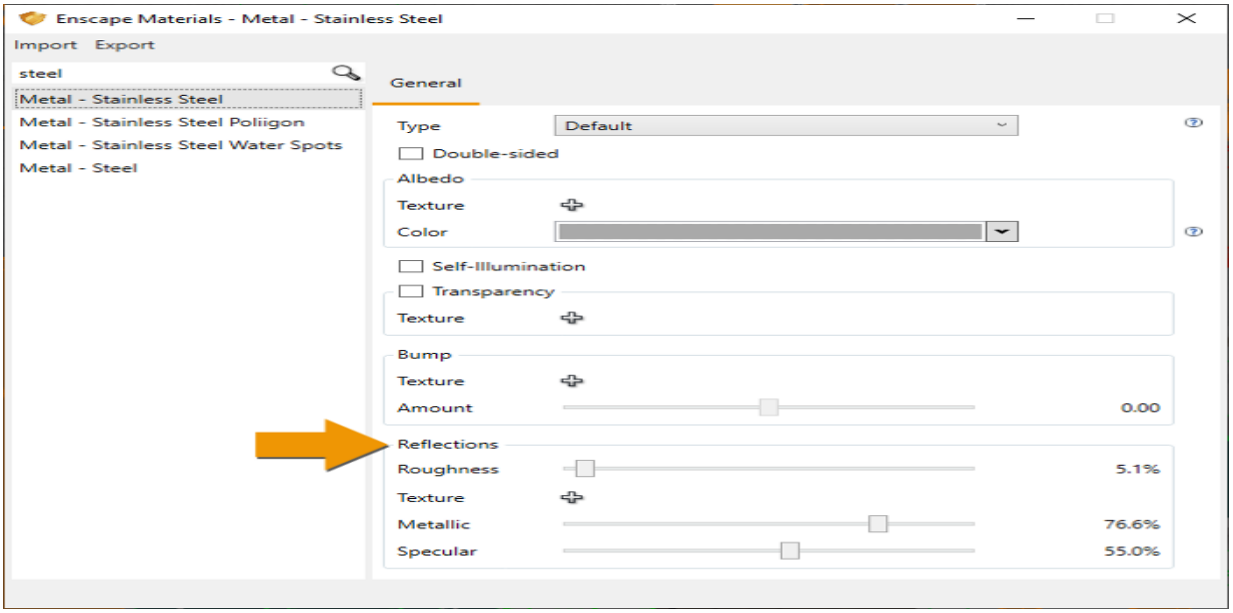
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For this tutorial, I created a modern kitchen with lots of colors and materials. Do the appliances, decorative items, chairs and plants look familiar? They are all from our Asset Library; check out the over 300 new models here. The project already looks great in Enscape, but the new Enscape Material Editor lets you take your materials to a new level of realism. Let's take a look at how it works. When you open the Material Editor, you can access and refine any material you have created in the ArchiCAD's Surface Editor. Simply scroll to find and select it, or search the title in the Search bar.





Upon opening the Editor you have a variety of refinement options. In this post, we'll cover the features that are now new to ArchiCAD users: bump and roughness maps. But first, let's take a look at some basic functionalities. One thing that can definitely be improved upon is the metal of the stove. The basic ArchiCAD stainless steel material is extremely reflective; reducing this even slightly would already boost the realism of the scene. In the above stainless steel material profile, you'll see under the Reflections category that the roughness value is quite low; this translates to a highly reflective material. This value defines basically how smooth or rough a material appears: a smooth material will be more reflective than a rough material.

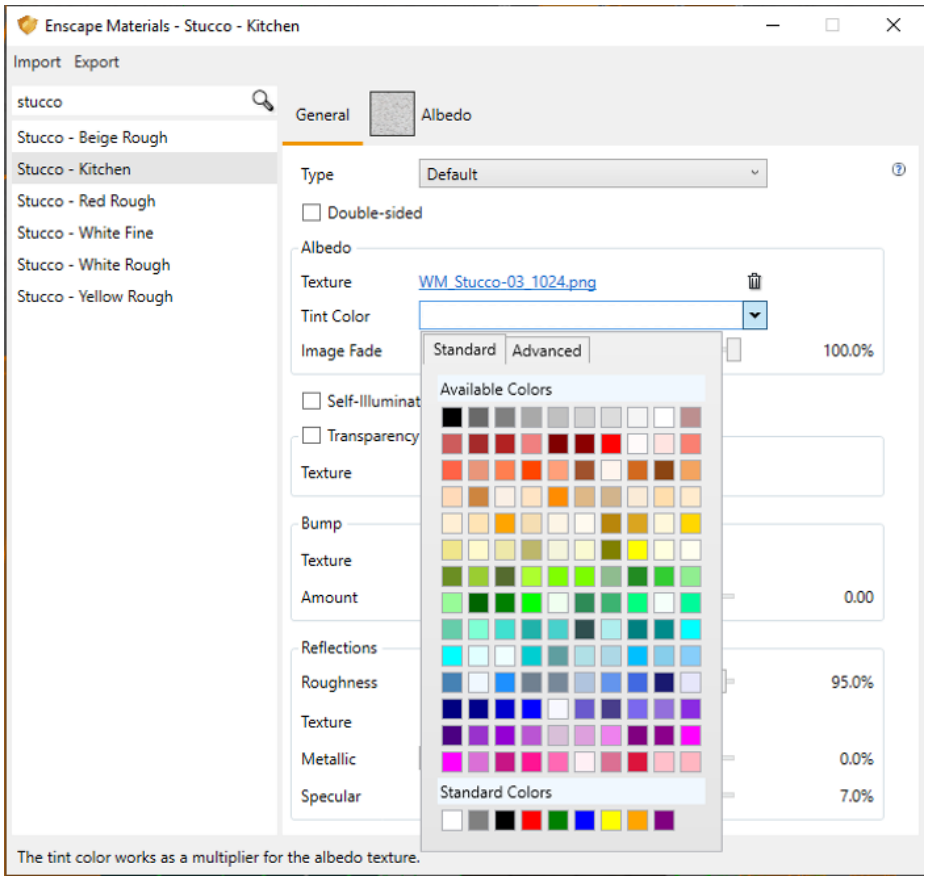




Increasing the roughness just slightly already takes the edge off the reflectivity. Reducing the metallic value gives the material the brushed look that many kitchen appliances have. This effect can be heightened even more by introducing a bump map, which we'll cover below. If the stove was distractingly reflective, the marble countertop is not reflective enough. This popular material for a counter is extremely shiny, and if we were able to see reflections in it, the scene would already look more realistic. Here we simply reduce the roughness value to 0%.

Just like that the marble looks much more true-to-life. It is now as highly reflective as it is in real life, and we are able to make out the reflections of the objects standing on the counter.

Another quick setting you can play with is Tint, located in the Albedo section. You can change the tint of any applied albedo texture via the dropdown menu; select a standard color, or enter values in the Advanced tab to get the hue just right.



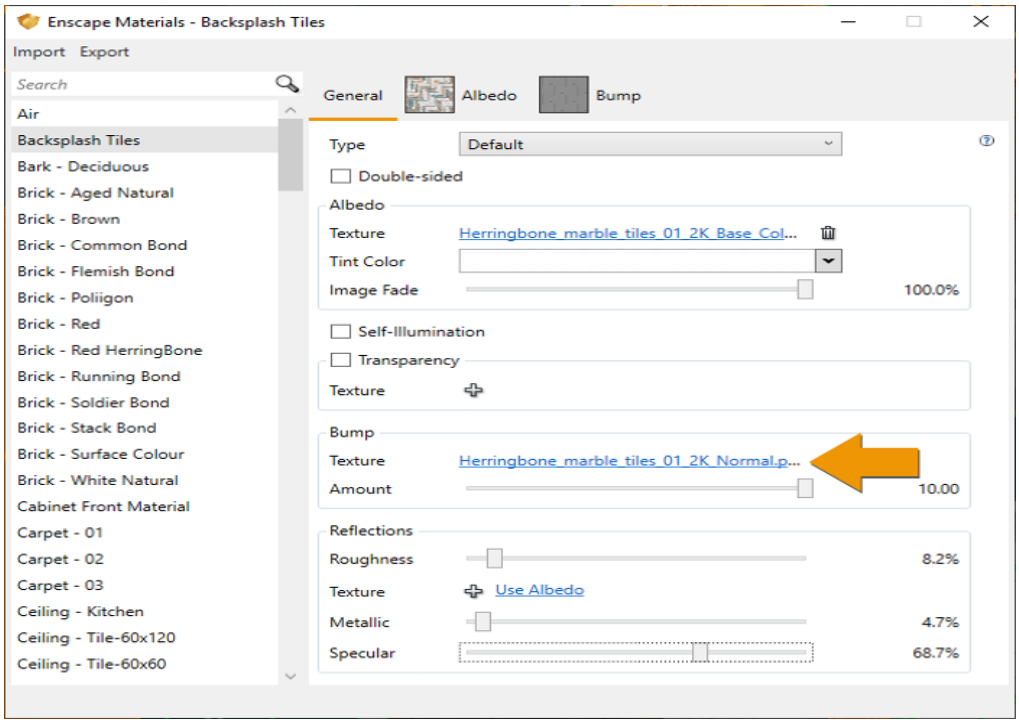
In our kitchen, I've played around with this setting to test out colors for the stucco walls. The color updates automatically, so I can see what paint color would look best without having to change the applied texture each time. In the end I stuck with classic white.



Bump maps.

Now that we have covered the basic functions of the Editor, I'll cover how to most effectively use the new features for ArchiCAD users, starting with bump maps. Previously not supported in the native ArchiCAD Surface Editor, bump maps are usually the deciding factor in creating a realistic rendering. If you've ever looked at a stunning rendering and wondered how to achieve that photorealistic look, the answer is oftentimes simply: add a bump map.



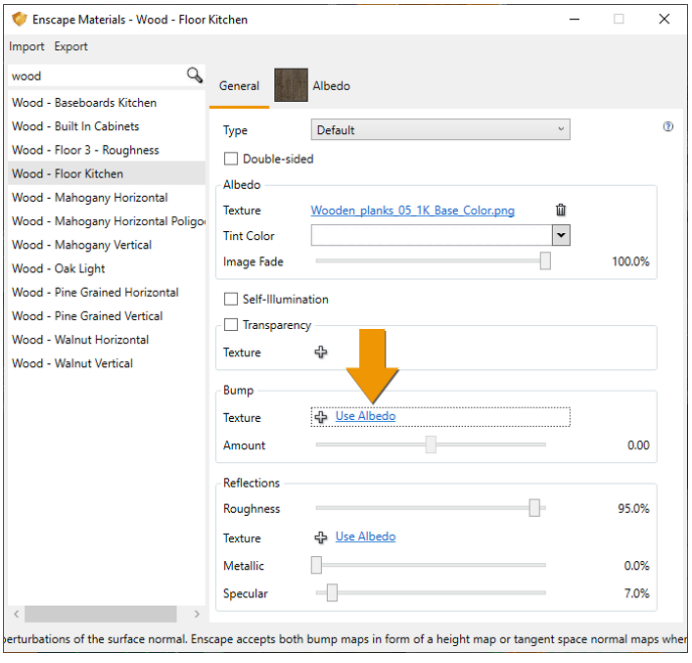


This tiled backsplash is certainly an eye-catcher, but right now it's for the wrong reasons. It looks less like real tile and more like a printed wallpaper. Adding a bump map will define the tiles and render them more realistic. The tiles are a free 3Dtexture from CG Bookcase. The download included a ready-made bump map, which I applied as a bump texture in the Bump section of the Material Editor.

If your textures didn't include a bump map, that's absolutely no problem. If you have an albedo texture applied, you always have the option to use your texture as a bump map. Simply click the Use Albedo link in the Bump section and Enscape will take care of the rest.

When there is a bump map applied, you have the ability to control the amount of bump added. What does this mean, and what effect can it have? Bump maps are used to create the illusion of raised details on a surface: for example, the height difference between the tile and the grout in the previous example. Bump maps are grayscale, and the black and white areas tell Enscape two things: up or down. The black areas of a bump map simulate depths and the white areas raised areas.

So, adjusting the amount of bump controls the intensity of this effect: a high amount of bump results in deep groves and high raised areas, a low amount results in a more even-looking surface. Let's test this on our kitchen's wooden floor.



Without any bump applied, it already looks pretty nice, but we can do better. I didn't have a dedicated bump map for this texture, so I used the albedo texture. Below you can see the result of increasing or decreasing the amount of bump; 3 is the default value for bump.

Here the effect becomes quite visible. At zero the floor is completely flat, like a photo. With a value of 10, the bump map is extreme and shows the grain patterns in detail. It's a good idea to play around with the value to see what fits best into the scene. The default value of 3 already looks great, but it looked a bit too rough to be flooring to me, so I chose 1.75, for slight definition.

Roughness maps

The second big improvement that the ArchiCAD Material Editor brings is roughness maps. These work in tandem with the roughness value we adjusted to make the marble shiny and the stainless steel more matte. Roughness maps control the sharpness of the reflections on an object. The roughness slider increases the reflectivity in a uniform manner; the whole surface will become more or less reflective. A roughness map defines roughness or reflectivity of certain areas of your texture. This map can be used to great effect to add character to the surface of an object: scratches, fingerprints, smudges, etc.

Speaking of smudges, there's one clear place to show the effect of a roughness map, and that's the kitchen sink. Right now it is very clean and shiny. But in a real kitchen, it's probably the first surface to get dirty or splashed with water.



To test two different effects, I applied two different roughness maps to the Texture area of the Reflections section. Both also came from CGBookcase, who have a great variety of free roughness maps to simulate surface imperfections. There's even a roughness map to add fingerprints to a surface!

Here you can see the results. The first image shows a sink with dried water stains, while the second is a smudge roughness map, which indicates an effect between wear and tear and imprecise cleaning. Another tip for our Material Editor: when you apply a texture, bump or roughness map, you can adjust settings specific to that map by clicking the corresponding tab. Here you can adjust the brightness and inversion, and if you tick the checkbox next to "Explicit texture transformation", you'll be able to change the size and rotation of the map or texture.

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