

# *Shades Of Life – Projection Shader Documentation*

## *Things to make note of:*

- \* 3D view gives no visual indication of Projection Mapping or any of its controls, changes made to Projection Mapping features will need to be rendered in order to be seen. This is a limitation of what's possible in regards to linking custom shaders and real time display.
- \* Texture scaling will sometimes need to be adjusted to fit your needs, depending on how far your objects of interest are from the camera. The easiest way to do this is with Z Scale alone, as this adjusts both X and Y tiling together (it's actually scaling your image with infinite tiling).
- \* Since displacement values often depend on the size of the object and its distance from the camera, changing the Z Scale or Y/X tiling and moving the camera around will change how your displacement renders slightly. This is how the DAZ Studio renderer works, and it can easily be accounted for by modifying the Displacement Strength value.
- \* The limits on each of the rotation values are designed to give the user one full rotation and are based on degrees. The default for Z is -180 because the mapping method I used actually comes in upside down. Z will spin the image much like rotating in Photoshop, X and Y tilt the image back and produce an effect more similar to skewing for producing depth. When using values of 90 or -90, the texture gets skewed into infinity (imagine a tiled texture on infinite planes above and below the camera).
- \* Values beginning with "UV" will only affect the surface while in UV mode, when in Projection mode these values will have no affect.
- \* The textures are coming from the camera, but things like displacement and bump still rely on the surface geometry for their direction. So it will not displace towards the camera, it will displace along the surface normals like normally mapped textures would.

### *1. What does ES stand for?*

ES is short for "Edge Specular" which is the effect I added for controlling highlights on edges

### *2. Why 2 displacement maps? What is each one for?*

This is essentially the same displacement as Project EYeris. It allows me to better mix low detail (big features) and high detail (small features) while avoiding limitations of bump and normal maps.

3. *Promo mentions "the Projection Shader's UV mode". How do I access this, or is it automatically loaded?*

Presets load in Projection mode by default, but can be switched by setting the "UV - Projection Mapping" value in the shader to 0. This value is rounded and doesn't accept anything other than 0 and 1 (meaning it's unable to produce a blend of projection and UV mapping with point values).

4. *Can I combine the Projection Presets with Ubersurface Presets on the same model for different material zones?*

Yes, there shouldn't be any issue combining with various other shaders in different mat zones. Since these shaders are heavily dependant on displacement there will likely be surface offsets between material zones using different shaders or shader values.

5. *How do I go from large scale to small scale like in the Promo?*

There's really nothing special happening in this render, the small figure is just very close to the camera while the large is in the distance. This just shows that it can be used at any scale with the same effect, both figures use the same general settings.

6. *Promo #3 shows UV Mapping and Projection. Which preset do I use for each method? Is it Uber for UV Mapping and Projection for Projection Mapping?*

Correct, UberSurface presets will load in UV Mapping (as they have no other option) but you can also set the Projection shader to UV Mapping as mentioned in answer #3.

7. *Will only one shader work in a scene at a time? And do they all have to have the same scale and rotation settings?*

You can have as many instances of the shader in the same scene as you want to my knowledge, they can all share or have different rotation and other settings. By using the same settings for presets using the same shader you're able to produce the blending effects mentioned in the promos, but this isn't required.

8. *How come the textures don't move with the model? Is there a way to bake them to the surface? And, if so, does the model have to have UV's to bake the textures on? Also, will the baked texture look the same as it does when projected?*

Textures are locked to the camera rather than to the model it's used on. Since DS uses the camera's position to decide where textures should be, when the camera changes position in relation to the model textures are moved along with it. Baking would require some additions to the shader that I was unsure how to do during production, but this could be added in an update. As far as I know the results of baking should produce the same render appearing while removing the limitations of projecting.

9. *Min and Max Displacement and Displ Strength affects both Displacement A and B, right?*

Yes, Min/Max and Strength all affect A and B (though A and B have their own strength values as well). Both A and B are designed to use "full range" maps which go from pure white to solid black in brightness (giving the most detail each image allows). Using A and B together you want one for large features and one for fine details. When considering strength for the two, you want the fine details to line up in depth and in contrast with the large features. Since Min/Max affects both the strength and contrast, using separate values for two full range maps derived from the same source (as most disp/bump maps would be) offsets their relationship. Having the values for A and B linked together assures that the details made when creating the map carry over to rendering with equal relation to large features as expected.

10. *Can you explain what attenuation means, and describe the values used for ES Specularity?*

When working with my Edge Blend Specular it helps to keep Fresnel effects in mind, as it's the same idea (brighter on surfaces parallel to the camera than those which are perpendicular). Here I have different things attached to this Fresnel or "Edge Blend" effect to allow for more control. My main intention was to drive the gloss with this effect, to essentially give things "rough edges". I feel this helps a lot with this like rim lights and other highlight effects with some fun variation. Specular effects not labeled "ES" work as the DS Defaults do.

Attenuation is basically the contrast of the effect, changing how gradually one value fades to the other.

**ES Inner Color** - Color used for parts of surface perpendicular to camera

**ES Outer Color** - Color used for parts of surface parallel to camera

**ES Inner Roughness** - Roughness used for parts of surface perpendicular to camera

**ES Outer Roughness** - Roughness used for parts of surface parallel to camera

**ES Strength** - Overall brightness of the Edge Blend Specular effect (can be driven by map)

**ES Color Attenuation** - How much blending is used for inner an outer Color values

**ES Roughness Attenuation** - How much blending is used for inner an outer Roughness values

### 11. *What do each of the UV values do, and why do they seem split up?*

I tried keeping like values grouped together in the shader best I can, but DS defaults to listing the values alphabetically which arranges values different than I'd like.

**UV Horizontal Tiles** - Number of tiles on the X axis (in UV Mapping mode only)

**UV Vertical Tiles** - Number of tiles on the Y axis (in UV Mapping mode only)

**UV X Offset** - Translates the texture on the X axis (in UV Mapping mode only)

**UV Y Offset** - Translates the texture on the Y axis (in UV Mapping mode only)

**UV Mapping - Projection Mapping** - Switches between UV Mapping and Projection Mapping modes by using a value of 0 or 1 respectively.

### 12. *Can it be used with animated scenes or figures?*

The shader is linked to the camera in regards to it's texture location, so moving objects or moving the camera in animation will make it look like the texture is moving (zooming the camera in shouldn't change anything). It can be a limitation but it can be used for some cool stuff too, were you to make a heavily displaced rock golem and move him around it would animate the rubble and make it dynamic.

### 13. *How does the shader render in reflections?*

The image is projected from the front and also projects to the back of the sphere. This means the sides of the sphere are banded however as the projection is hitting surfaces at an angle there. If your reflections are showing the sides of this sphere you will see the banding.

**Reference:**

