

(Dawntrail) Shader Reference Table

This page is a list of tables with explanations/annotations of how the New shaders in dawntrail work. Most of this page has been adapted from the Textools Reference Document by Sel. Extra information is added based on research and conversations in modding creation discords, mainly the Textools and Bibo+ Discords.

This page is partially incomplete as we still do not fully understand every shader. Shaders with entirely blank boxes are those that we know exist, but do not understand how they work. Any important notes or observations about these shaders will be notated below their shader tables in Red.

The following explains how each color/data channel is used in each shader.

Channels are listed by their Default Behavior whenever variable.

Channels listed in **Purple** are variable and affected by shader keys. These will be listed Below each main table for the shader, before any notes or annotations.

SubSurface Scattering (SSS) and **Fur Settings** are controlled by the same channels/fields when applicable

*Please note that all textures making use of an alpha channel for non-transparency should be saved as either **.DDS** or **.TGA** when bringing it in/out of an art program. PNG frequently gets mishandled by programs and ends up "eating" the alpha channel or forcing it as transparency, which destroys the data used.*

FFXIV uses the OpenGL format for Normal map direction (Y+ up if you are using a software with diffuse to normal generation capabilities)

Character.shpk (Gear & Monster Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Power
GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	Opacity	BLUE	Ambient Occlusion
ALPHA	Unused	ALPHA	Unused
Diffuse Texture		Specular Texture	
RED	Standard Color Data	RED	Standard Color Data
GREEN	Standard Color Data	GREEN	Standard Color Data
BLUE	Standard Color Data	BLUE	Standard Color Data
ALPHA	???	ALPHA	???
Index Texture		Flow Texture	
RED	Colorset Pair (0-16)	RED	???
GREEN	Colorset Even/Odd Blending	GREEN	???
BLUE	Unused	BLUE	???
ALPHA	Unused	ALPHA	???
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Specular Mask	RED	Faux-Wind Influence
GREEN	Roughness	GREEN	Faux-Wind Multiplier
BLUE	Diffuse Mask	BLUE	???
ALPHA	Opacity	ALPHA	???
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Decal UV Channel (FC Crests, etc.)

Flow Map Mode? - Flow Texture	
Key : 40D1481E	
Value	Effect
337C6BC4	Standard Value
71ADA939	Enable Flow Map?
SIMPLE	Unknown

This is the standard shader used for most things you would mod (gear, minions, mounts, weapons) that are not options tied to the CHaracter creator. This shader will probbaly be the one you look at most often. There are a few other things that this shader can do based on keys, and I will explain them below.

This shader can make use of a field named "Effect ID". There appear to be 5 total shader effects, and number 3 is what's used for a holographic/iridescent effect seen on some new gear. In order to utilize these effects, you must also set a value for "Effect Opacity". 0 means there will be no effect, 1 is full effect, and over 1 appears to be multiplicative. This effect is only possible on gear with the new Character shader, and not Character Legacy (the endwalker compatability version of this shader).

Number 1 seems to apply a "clear vinyl overlayer" effect

CharacterLegacy.shpk (Endwalker Gear & Monster Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Power
GREEN	Standard Tangent Space Normal Map	GREEN	Gloss
BLUE	Opacity	BLUE	Ambient Occlusion
ALPHA	Unused	ALPHA	Unused
Diffuse Texture		Specular Texture	
RED	Standard Color Data	RED	Standard Color Data
GREEN	Standard Color Data	GREEN	Standard Color Data
BLUE	Standard Color Data	BLUE	Standard Color Data
ALPHA	Unused	ALPHA	Unused
Index Texture		--	
RED	Colorset Pair (0-16)	RED	

GREEN	Colorset Even/Odd Blending	GREEN	
BLUE	???	BLUE	
ALPHA	???	ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Diffuse Mask	RED	???
GREEN	Gloss	GREEN	???
BLUE	Specular Mask	BLUE	???
ALPHA	Opacity	ALPHA	???
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Decal UV Channel (FC Crests, etc.)

Specular Mode - Specular Texture	
Key : C8BD1DEF	
Value	Effect
OFF	No Specular Texture
MASK	Use Mask sampler for Specular
SIMPLE DEFAULT	Use Spec sampler for Specular
A7D2FF60	Unknown

This is the Character Legacy shader. It is a port of the old endwalker shader for compatability with old assets that have not been updated by Square Enix. **It is Not recommended to continue creating anything for this shader**, as it is not able to do all the things that the new Character shader can. Most Assets will still be using this shader unless updated by Square Enix or a modder. This shader is to our knowledge, not capable of handling some of the extra shader effects that the new Character shader can.

Skin.shpk (Character Skin Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Power

GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	Skin Color Influence	BLUE	SSS Thickness/Fur Parallax
ALPHA	Wetness Mask	ALPHA	Hair Highlight Color Influence *
Diffuse Texture		--	
RED	Standard Color Data	RED	
GREEN	Standard Color Data	GREEN	
BLUE	Standard Color Data	BLUE	
ALPHA	Opacity	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Muscle Slider Influence	RED	Unused (?)
GREEN	Unused	GREEN	Unused (?)
BLUE	???	BLUE	Unused (?)
ALPHA	Shadow Castin On/Off	ALPHA	Unused (?)
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Decal UV Channel (Legacy Mark)

Vertex Color Mode - Model Vertex Colors	
Key : F52CCF05	
Value	Effect
MASK	Use as Mask
COLOR	Use as Diffuse Color
BRED74BAC	Unknown Hair Mask *
501365B5	Unknown Emissive mask
* Also enables Mask Alpha	

This is the Shader used for Body skin, Faces, and Hrothgar Skin with Fur.

- As a note, When both Skin influence and Hair influence are set, Skin influence wins out.

When working with this shader for body mods, Keep in mind that as of writing this, Body mods on the Female base (bibo, tf gen 3, etc) use skin type Body/standard skin. However, Male body mods (TBSE) Use the Hrothgar shader key for skin to allow for body hair that changes with head hair color. As such, authoring of maps for these two may differ slightly.

When using/authoring skin using the Hrothgar version of the skin shader, pay special attention to the alpha and blue channels as they are interconnected. The blue channel will be both skin color influence (depigmentation) AND Hair color selection at the same time, with the alpha determining which of the two effects are used in what spot. Portions of the blue channel that are not pure white with a BLACK alpha become depigmentation while the areas with a WHITE alpha become hair color influence.

You can create a faux metallic effect on skin by confusing the Subsurface shader (though be careful). To do this, set the blue channel of the mask to a value close to 255. this creates an effect that is both metallic and subsurface at the same time. This has not been tested on the Hrothgar version of this shader.

While skin has an opacity mask, This can not be used to create a semitransparent body part, as the opacity has a "clamp" on it's values, effectively turning it from a scaled value into a yes/no. More research is needed to see if this can be changed.

As emissive is a shader key on the same level as hrothgar (body hair on skin) you cannot use both emissive and dyeable body hair on skin at the same time using vanilla shaders. this is non-negotiable.

Hair.shpk (Hair Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Power
GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	Highlight Color Influence	BLUE	SSS Thickness
ALPHA	Opacity	ALPHA	Diffuse Mask / Ambient Occlusion
Diffuse Texture		--	
RED	Standard Color Data	RED	
GREEN	Standard Color Data	GREEN	
BLUE	Standard Color Data	BLUE	
ALPHA	Opacity	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	

Model Data			
Vertex Color 1		Vertex Color 2	
RED	???	RED	Faux-Wind Influence + Anistropy
GREEN	???	GREEN	Faux-Wind Multiplier
BLUE	???	BLUE	???
ALPHA	Shadow Casting On/Off	ALPHA	???
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Opacity Mapping for Miquo'te?

Sub Color Map - Normal Blue Channel	
Key : 24826489	
Value	Effect
FACE	Use as Tattoo Color Influence
HAIR	Use as Hair Highlight Influence
584265DD	Unknown

This is the hair Shader. Many things have changed and unlike character, there is no legacy version of this shader. **All old hair mods must be converted to use the channels described in this section.** Hair is also used for Miquo'te tails.

At this time, the shader does not seem to be responsive to whatever value appearance plugins and tools such as Anamnesis, Glamourer, and Ktisis used to use for their "hair glow" parameter. This indicates something was shuffled around, but we are currently unsure as to what.

Iris.shpk (Eye Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Emissive Mask
GREEN	Standard Tangent Space Normal Map	GREEN	Reflection Mask/Cubemap Intensity
BLUE	Unused	BLUE	Iris Mask
ALPHA	Unused	ALPHA	Unused
Diffuse Texture		--	
RED	Standard Color Data	RED	
GREEN	Standard Color Data	GREEN	
BLUE	Standard Color Data	BLUE	
ALPHA	Unused	ALPHA	
--		--	

RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Left Eye color influence (odd eyes)	RED	Unused (?)
GREEN	Right eye color influence (odd eyes)	GREEN	Unused (?)
BLUE		BLUE	Unused (?)
ALPHA		ALPHA	Unused (?)
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Unused (?)

63030C80 - Unknown Effect	
Key : 63030C80	
Value	Effect
EFDEA8F6	Unknown

This is the iris, or new eye shader. **There is no legacy version of this shader that can be used on players, so ALL eye mods must be thrown through a converter** such as Loose Texture Compiler or Textools' Eye saver. This is non-negotiable.

The new iris shader allows for Sclera and Iris to be on the same map, allowing for some interesting effects

A large thing to note compared to old eye mods is that **the catchlight is no longer an editable texture, and is now permanently part of the shader**. All catchlight mods or edits can no longer be used. If you want to create a fake catchlight, you can draw this onto the diffuse, but it will be static and not move around. This is not fixable, and we do not currently know if catchlight will ever be editable, even using shader parameters.

Likewise, **Au Ra limbal rings are also part of a shader now, and no longer part of a texture**. Any mods that altered the Au Ra limbals must be scrapped. While shape cannot be changed, there is a shader constant that allows them to be turned on and off, and this is available for all eyes, not just au ra. The parameters to change are

7DABA471- g_IrisRingEmissive	0-1 (au ra at 0.8)		
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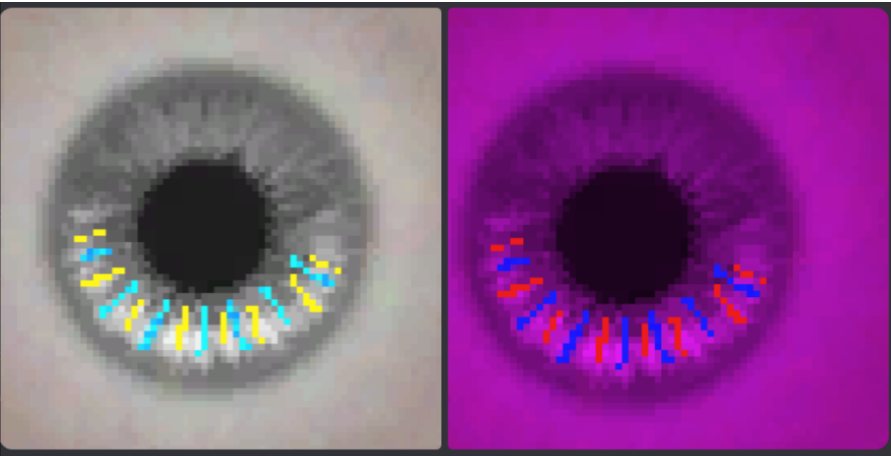
58DE06E2-Limbal Color	Red (0-1)	Green (0-1)	Blue (0-1)
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Furthermore, Sclera can either be changed by drawing on the diffuse, OR by changing shader constant 11C90091-g_ White Eyes Color. the 3 values are RGB going from 0-1 in each box.

Emissive is now included in the eye shader for ALL eyes, but in order to activate it, you need to mask out where you want glow on the mask RED channel, AND turn the shader constant 3BA64362-g_Emissive color on by changing the 3 values to not 0. the three editable boxes are RGB values that you may choose, that go from 0-1. emissive strangth is not known how or if it can be edited.

Finally, due to the eyeball now being a diffuse texture, it is possible to get multicolored eyes without having to sacrifice heterochromia. This both makes them more compatible with a variety of heads, and allows for more than 2 colors. because FF14 overlays the eye color closest to the layer style Multiply, it is best to check how colors will interact by simulating in an art program. You can either draw with color on the iris portion of the diffuse, and then allow eye color influence to change those colors, or draw with color on the diffuse, and then mask off the same areas/gradients on the Mask Blue channel, to stop those portions from changing with your eye color.

This is an example of simulating how placing colors on the diffuse and then allowing the game to put color on top can change the colors. This is a simulation in an art program, but it's enough to show what the effect will do when you do not mask out the colored parts on the multi.



CharacterTattoo.shpk (Face Tattoos Shader)			
Texture Data			
Normal Texture		--	
RED	Standard Tangent Space Normal Map	RED	
GREEN	Standard Tangent Space Normal Map	GREEN	
BLUE	Mole or Tattoo Color Influence	BLUE	

ALPHA	Opacity	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	???	RED	
GREEN	???	GREEN	
BLUE	???	BLUE	
ALPHA	???	ALPHA	
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	???

Decal Mode - Model UV2 Layer	
Key : D2777173	
Value	Effect
OFF	No Decals
COLOR	Use as Color Decal Placement
58.4265DD	Use as Alpha Decal Placement

There isn't much to edit about this shader, but it is important to keep in mind, as Facial ETC textures have multiple materials that all point to the same textures, but have different shader keys and parameters. Before changing any, please check this table, or make the texture path for the specific one you want to change unique.

CharacterStocking.shpk (Stocking/Translucent Cloth)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	See character shader

GREEN	Standard Tangent Space Normal Map	GREEN	See character shader
BLUE	Opacity* (Skin visibility)	BLUE	See character shader
ALPHA	Unused	ALPHA	Unused
Diffuse Texture		Specular Texture	
RED	See character shader	RED	See character shader
GREEN	See character shader	GREEN	See character shader
BLUE	See character shader	BLUE	See character shader
ALPHA	See character shader	ALPHA	See character shader
Index Texure		--	
RED	Colorset Pair (0-16)	RED	???
GREEN	Colorset Even/Odd blending	GREEN	???
BLUE	Unused	BLUE	???
ALPHA	Unused	ALPHA	???
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Specular Mask	RED	Faux wind influence
GREEN	Roughness	GREEN	Faux wind multipler
BLUE	Diffuse mask	BLUE	???
ALPHA	Opacity	ALPHA	???
UV Channel 1		UV Channel 2	
UV	Normal UV	UV	Decal UV
UV Channel 3			
UV	Skin UV		

As of 7.1 This shader is being adapted to player gear which allows us to research it more. This shader is nearly identical to the character (gear) shader, with a few exceptions. The main thing is that **this shader utilizes UV channel 3 to copy and put skin underneath the "stockings"** using only one mesh instead of the double layer mesh technique previously used. **This is hardcoded to skin material A** however, which means it will always be the symmetrical skin.

Texture wise, "opacity" on the normal map's blue channel is no longer overall opacity, but determines where and how much skin is shown "underneath".

Do NOT enable transparency in the material flags for this shader though, as it will crash your game.

The "nylon" texture and effect used on most gear with this shader is tile material 43, and you can get a nice stocking effect using a negative sheen value. Finally as of current research, sphere maps (like the holographic effect) seem to be disabled for this shader.

As of current research (12/03/2024) It seems that there is a strange link to material A used for this shader. When a modded skin mat A is loaded via texttools into the game, the modded mat A shows correctly underneath the stockings, however when a modded skin mat A is loaded via penumbra, it does not. we are currently looking into why this is and how to cause the texttools behavior on penumbra. The mod type (ttmp2 vs pmp) used does not change this behavior, nor can the penumbra behavior be circumvented via using texttools' attach to penumbra system. for now a partial sort of fix is to have your modded skin in the default collection (this will mean everyone has your skin) in order for the stockings' mat A to properly reflect your skin. we don't know why this is the case, but it is likely due to how penumbra handles loading files vs texttools. This has been tested on and works well on middle based ladies, but we could not get it to work on men. if you would like to test, please do and post a comment on this page of the results. (thank you to Virgo on discord for this research)



Texttools load (unsafe mode)



Penumbra load

CharacterOcclusion.shpk (Eye Occlusion Shader)			
Texture Data			
Normal Texture		--	
RED	???	RED	
GREEN	???	GREEN	
BLUE	???	BLUE	
ALPHA	???	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
--		--	
RED		RED	
GREEN		GREEN	

BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Standard Tangent Space Normal Map	RED	Unused (?)
GREEN	Standard Tangent Space Normal Map	GREEN	Unused (?)
BLUE	???	BLUE	Unused (?)
ALPHA	Unused	ALPHA	Unused (?)
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	???

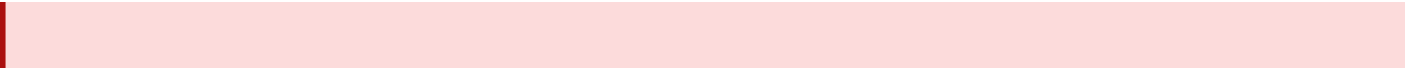
Vertex Color Mode - Model Vertex Colors	
Key : F52CCF05	
Value	Effect
MASK	Use as Mask
COLOR	Use as Diffuse Color
5F4268BAC	Unknown
5CC605B5	Unknown

There isn't much to say about this shader.

CharacterGlass.shpk (Glass Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Power
GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	Opacity	BLUE	Ambient Occlusion
ALPHA	Unused	ALPHA	Unused
Index Texture		--	
RED	Colorset Pair (0-16)	RED	

GREEN	Colorset Even/Odd Blending	GREEN	
BLUE	???	BLUE	
ALPHA	???	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	Specular Mask	RED	Faux-Wind Influence
GREEN	Roughness	GREEN	Faux-Wind Multiplier
BLUE	Diffuse Mask	BLUE	???
ALPHA	Opacity	ALPHA	???
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	Decal UV Channel (FC Crests, etc.)

Specular Mode - Specular Texture	
Key : C8BD1DEF	
Value	Effect
OFF	No Specular Texture
MASK	Use Mask sampler for Specular
SIMPLE DEFAULT	Use Spec sampler for Specular
A7D2FF60	Unknown



This shader is still very under researched. We have a general idea of how it works, but not enough for any automatic texture conversions to look good. If you have any observations or are willing to research it, please let us know.

Bg.shpk (Furniture Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Mask A?
GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	???	BLUE	Specular Mask B?
ALPHA	???	ALPHA	???
Diffuse Texture		--	
RED	Standard Color Data	RED	
GREEN	Standard Color Data	GREEN	
BLUE	Standard Color Data	BLUE	
ALPHA	Unused	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	???	RED	Unused (?)
GREEN	???	GREEN	Unused (?)
BLUE	???	BLUE	Unused (?)
ALPHA	???	ALPHA	Unused (?)
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	???

BG Vertex Paint - Vertex Color		
Key : 4F4F0636		
Value	Value	Effect
BD94649A		Use as Diffuse Color
	COMPATIBILITY	Unknown
	SIMPLE	Unknown
	1DF2985C	Unknown
	941820BE	Unknown
	07D3170F	Unknown

This shader is not fully understood.

BgColorChange.shpk (Dyeable Furniture Shader)			
Texture Data			
Normal Texture		Mask Texture	
RED	Standard Tangent Space Normal Map	RED	Specular Mask A?
GREEN	Standard Tangent Space Normal Map	GREEN	Roughness
BLUE	???	BLUE	Specular Mask B?
ALPHA	Opacity	ALPHA	???
Diffuse Texture		--	
RED	Standard Color Data	RED	
GREEN	Standard Color Data	GREEN	
BLUE	Standard Color Data	BLUE	
ALPHA	Dyeability Mask	ALPHA	
--		--	
RED		RED	
GREEN		GREEN	
BLUE		BLUE	
ALPHA		ALPHA	
Model Data			
Vertex Color 1		Vertex Color 2	
RED	???	RED	Unused (?)
GREEN	???	GREEN	Unused (?)
BLUE	???	BLUE	Unused (?)
ALPHA	???	ALPHA	Unused (?)
UV Channel 1		UV Channel 2	
UV	Normal UV Channel	UV	???

BG Vertex Paint - Vertex Color	
Key : 4F4F0636	
Value	Effect
BD94649A	Use as Diffuse Color

This shader is not fully understood.