



Sheffield Softworks

Perfect Skin

Perfect Skin comes from a long line of skin refining plugins from Sheffield Softworks. It has been completely written from scratch using every bit of expertise I've developed over the years. Not only have the smoothing algorithms been redesigned (including one for addressing blackheads and dark spots), and the skin selection techniques refined (along with a new onscreen control interface and a feature to mask areas of the screen), but the ability to smooth the chroma only allows blotches and blemishes to be reduced and a skin texture feature with size, lighting, depth controls has been added.



Perfect Skin is not only powerful, it's flexible as well, allowing you to choose from different skin selection techniques and four different smoothing algorithms with increasing levels of processing abilities and requirements.

Perfect Skin allows you to save presets to speed setup on similar shots. **Perfect Skin** is based on FxFactory's plugin engine which makes use of the power of your GFX card to do its rendering, thus does not load down your CPU. It is compatible with the hosts that FxFactory supports, currently FCP 7 through Final Cut X, Motion 4 and Motion 5, Adobe Premier, and After Effects. It requires at least 10.8 (Mountain Lion) of the OSX operating system (please note, the advancing age of Final Cut Pro 7 and Motion 4, may make them unable to take full advantage of the abilities of **Perfect Skin**).

Perfect Skin Overview

Perfect Skin has four sections. First is the Smooth Method; you may select One thru Four. Second is Skin Selection. This may be moderated by a mask and can be set to None (in which case the entire frame is processed), Skin Tones (which algorithmically selects standard skin tones), or Chroma Key (which a central color and a range is specified to be processed). The Third section varies depending on your Skin Selection - with Skin Tones, it's two simple sliders, with Chroma Keyer, the refining controls are quite extensive. The Fourth section is the optional Skin Texture generation.

The sections may be mixed/matched as appropriate to your footage. For instance, choosing Smooth Method One along with Skin Tones as the Skin Selection and no Skin Texture requires the lowest processing (has short render times) and is ideal for light smoothing applied as a general improvement. Smooth Method Four with Chroma Key Skin Selection and Texture generation tackles the toughest jobs, but comes with increased render times.

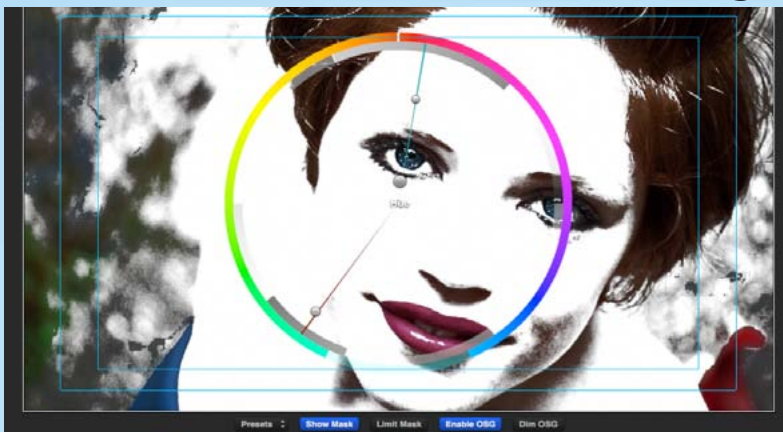
Instead of the standard eye dropper color selection and range sliders, for Chroma Key skin selection, you may choose OnScreen controls. With Show Mask turned on, this can allow you to quickly zero in on the skin tones in a scene by using control points for Hue, Saturation and Luminance. You pull the control points further from the center of the screen to limit their range and you rotate them around the center to choose the central Hue, Saturation, and Luminance.

The OnScreen Guides may be dimmed or turned off entirely, the control points will function the same, allowing experienced users to control the selection without distraction.

Skin texture generates a random pore pattern that can be adjusted to conform to the skin surface based on the luminance values. The amount of this conform and the angle of the "lighting" is controllable. Because Perfect Skin has no knowledge of the underlying structure, the generated skin texture may not always be convincing especially when there is a lot of movement, but used lightly, it can be quite effective.

It's important to note that the OnScreen Guides are rendered within the image buffer, so **Enable OSG** should be unchecked before rendering.

Perfect Skin Usage and Controls

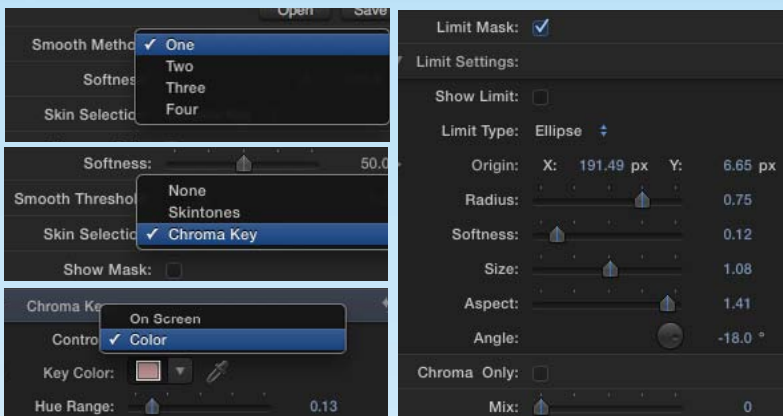


Perfect Skin makes use of a dynamic user interface that changes to appropriate controls based on various settings. This is because, for instance, different skin smoothing methods require different settings; different skin selection choices require different parameters, etc.

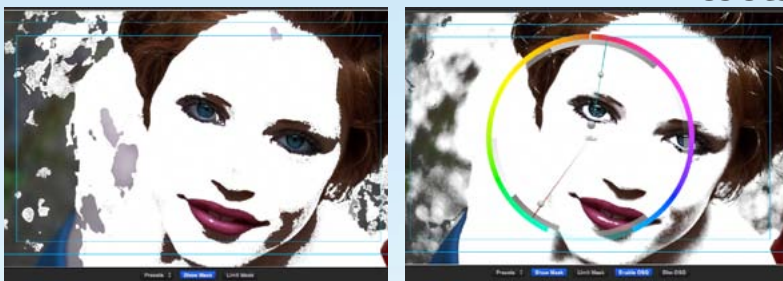
Your first task when using Perfect Skin is to make decisions as to how best to process your image - what will be the ideal skin selection method to use? How much processing will the talent's skin require? Will you need to mask off or limit the processing to the talent's face to avoid processing secondary talent or background elements?

Sometimes you can deal with all the problems in one pass of the plugin, other times the best answer may be to add multiple copies of Perfect Skin to deal with different problems (older talent might need wrinkle reduction, younger talent in the same frame may have acne issues). Sometimes the addition of the Coverup plugin may be warranted.

Making the right set of choices will lead to the best looking outcome with the minimum render time.



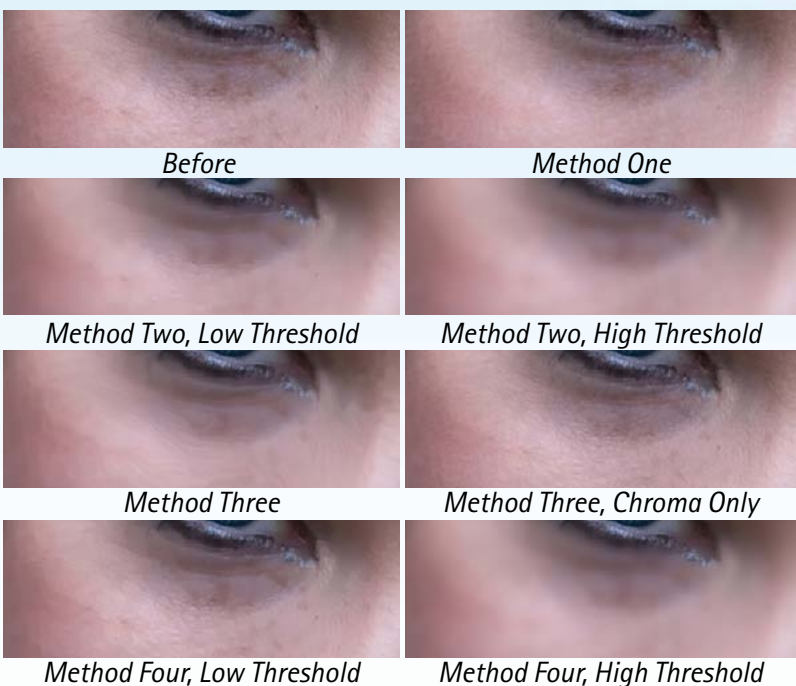
Presets



Because the complexity and variety of potential shots is infinite, no built in presets are provided. The **Presets** section provides a way for you to save and load your own presets.

This can be handy when you're processing multiple similar shots.

Basic Controls



Before

Method One

Method Two, Low Threshold

Method Two, High Threshold

Method Three

Method Three, Chroma Only

Method Four, Low Threshold

Method Four, High Threshold



Smooth Method offers four choices in increasing smoothing ability and processing requirements and different levels can have varying controls. **One** provides basic smoothing - easing fine lines and imperfections. It has one input, **Softness**. **One** is good at reducing dark areas like blackheads, moles, wrinkles, etc. **Two** is a stronger, thresholded smoothing. Adjust the **Softness** slider to set overall smoothing and the **Smooth Threshold** slider to control the level of detail that is retained. This is a good general purpose method that will handle most situations and has a moderate level of processing needs. **Three** and **Four** both provide a higher level of smoothing, but at a cost of greater processing needs as they analyze the image first. **Three** has a **Tweak** slider to reduce artifacting and is often best for **Chroma Only** smoothing. Method **Four** has a threshold slider to retain detail.

Basic Controls (cont.)



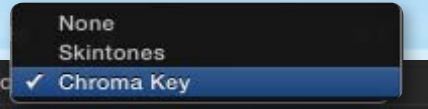
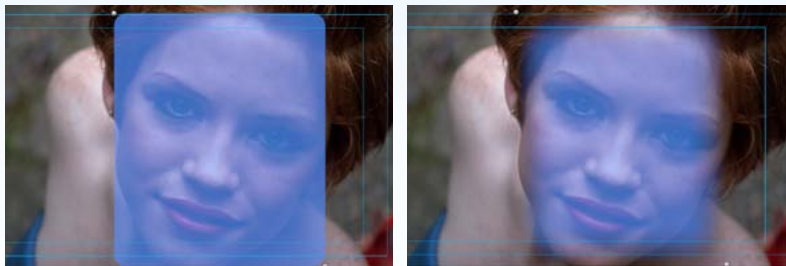
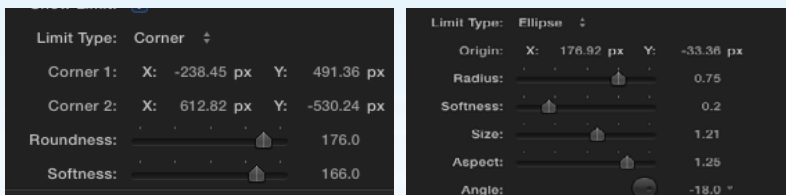
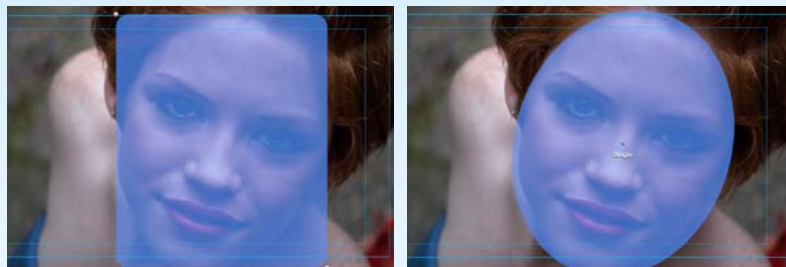
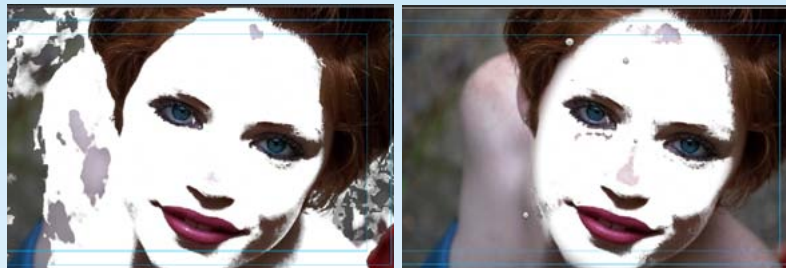
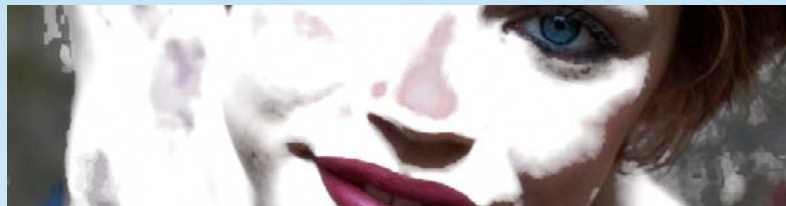
Before

None w/Limit Mask



Skin Tones

Chroma Key

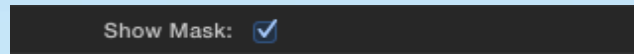


Skin Selection is used to limit processing to specific areas. This limit may be:

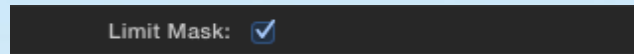
None - most often used to either process the entire frame or in combination with the **Limit Mask** to isolate a specific area.

Skintones - the skin tones are mathematically calculated. You may control the strength of the mask, and a lower threshold value. Skintones has a lower processing impact, but it is less precise than the third option -

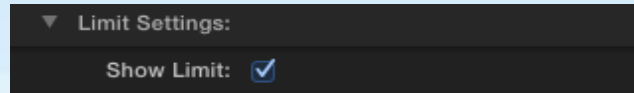
Chroma Key - may be adjusted by OnScreen controls or by selecting a skin color with the eyedropper and adjusting a range of acceptable values for Hue, Saturation, and Luminance. More on Chroma Key below.



Show Mask turns the selected region white as a visual aid when adjusting the **Skin Selection**.



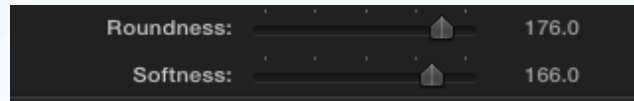
Limit Mask limits the processing to a specified region in the image. It opens up a secondary set of controls for specifying the region.



Show Limit tints the limit region of the screen a blue color as a visual aid for placing the limit. You can also use the Show Mask to see where the limit is being applied. Show Limit turns off all other processing to improve interactivity, so even though you can see through the blue tint, you will not see any smoothing taking place until your turn off Show Limit..



Limit Type may be set to either Corner (rectangular) or Ellipse. The controls will change as appropriate to each setting.



For **Corner**, the easiest way is to drag the two corners into place using the OnScreen handles, then adjust the **Roundness** and **Softness** as required. These settings are linked in that with Roundness at 0, Softness has no effect.



Origin

Radius



Softness

Size / Aspect



Angle

Tracking



Before

Chroma Only



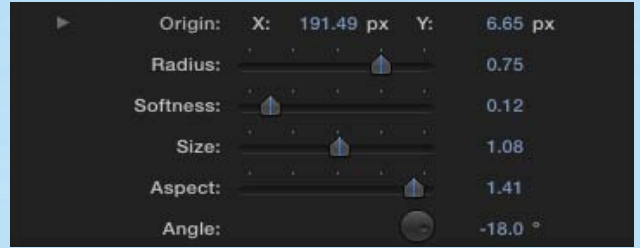
Original

Over Smoothed

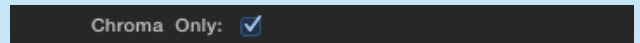
70% Mix



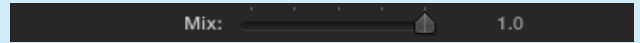
For Ellipse, the settings are more complex, but this allows greater flexibility and with a single origin point, is easier to use a host's built in tracking to maintain placement of the limit mask.



You may use the onscreen handle to place the **Origin** (or center) of the ellipse. The **Radius** controls the distance from the origin that the ellipse is drawn. **Softness** adjusts the falloff at the edge of the ellipse. **Size** and **Aspect** allow you to control the shape of the ellipse, and **Angle** rotates it around the origin. All are keyframeable to allow you to track a moving target.

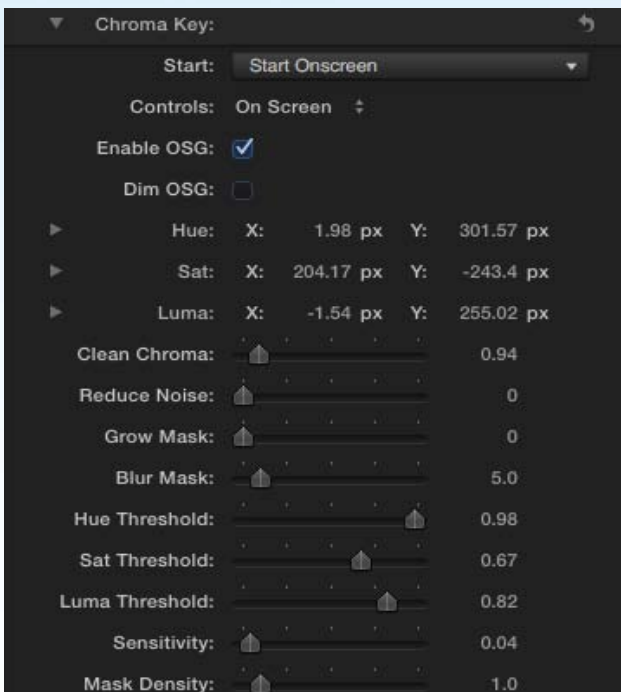


Chroma Only tells the plugin to process only the Saturation and Hue of the image and to leave the Luminance untouched. This can reduce the appearance of light freckling and small blemishes



Mix allows you to blend back the original image, returning detail if your image has gotten too "plastic" looking.

Chroma Keying

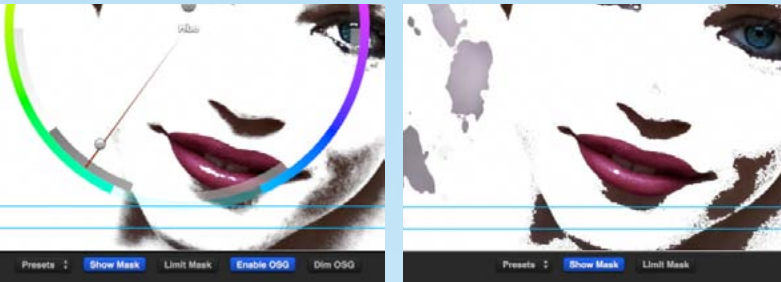
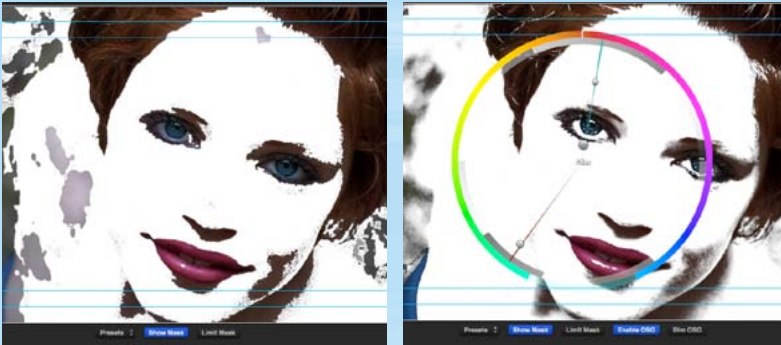


The **Chroma Key** for **Skin Selection** has quite a number of controls, so I thought I'd indulge in some basic keyer theory first to lay the groundwork. Whether using **OnScreen** controls or the eyedropper, you provide the keyer with a center Hue, Saturation, and Luminance and a range. Every pixel's Hue, Sat, Luma is compared and if it falls within that range, it is full strength (white) in the mask.

You also specify what to do with the colors that fall outside the range with the tolerance sliders. These are sort of a "margin" and tell the keyer how far outside the range a color is allowed to fall. For all colors that fall outside the range plus the "margin", the mask becomes transparent. The further outside the range, the greater the transparency. How fast the mask "falls off" is controlled by the **Sensitivity** slider.

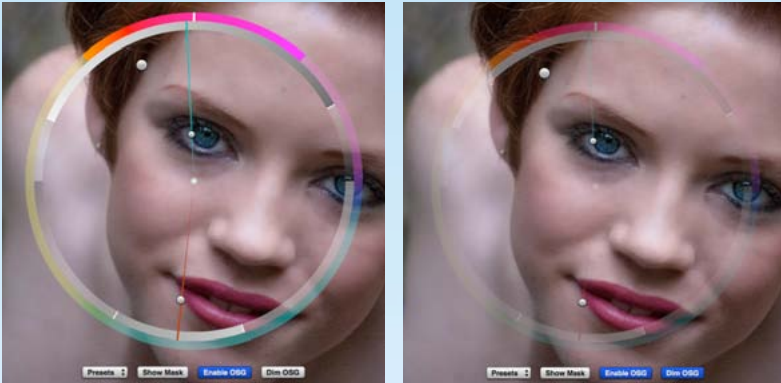
As well as keyer controls that are used to generate the mask, you also have additional pre-processing (**Clean Chroma**) and post-processing you can do (such as **Reduce Noise** - removes single pixels, **Grow Mask**, **Blur Mask**, etc.)

Chroma Key Controls

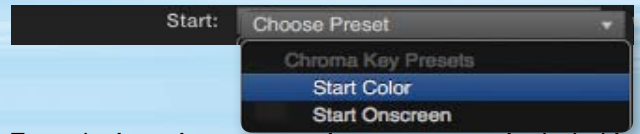


On Screen

Color



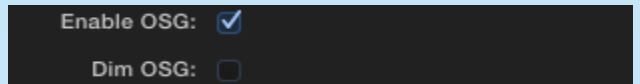
Note: The OnScreen Guides are rendered within the image buffer, so **Enable OSG** should be unchecked before rendering.



To make it easier, two starting presets are included in the Chroma Key section - Color and OnScreen. They set the controls to a general skintone that you will then refine. There is no save/load included as that can be done by the main Preset loader at the top of the controls.



The Controls for Chroma key may be either Color or On Screen. What you use is strictly a matter of your preference. Both provide the same information to the chroma keyer. The user interface varies depending on your choice. First we'll go over the On Screen controls, then the Color ones.



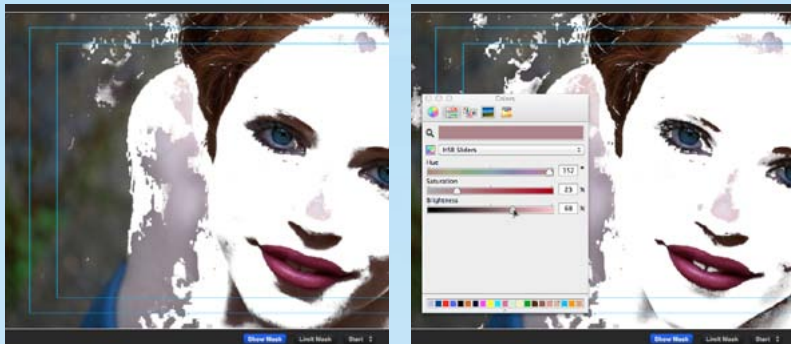
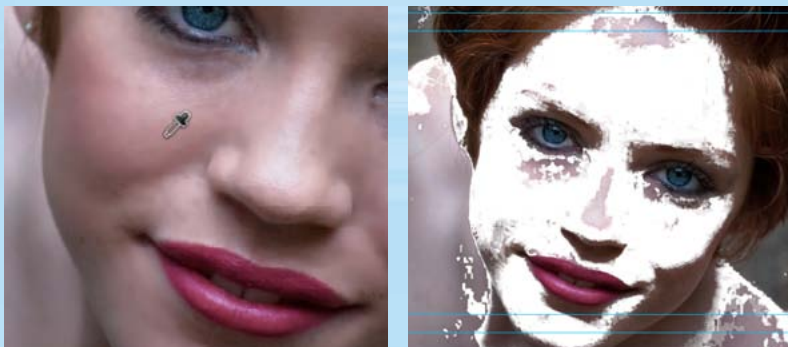
Enable OSG turns on the OnScreen Guides. These consist of an outer Hue Ring, and a semi-circle above for Luminance, and one below for Saturation. Dim OSG makes these transparent to allow you to see through them. They are graphic representations of the HSL and ranges being selected and are not necessary to adjust the OnScreen control handles. Experienced users may end up dispensing with their use.

Hue:	X:	1.98 px	Y:	301.57 px
Sat:	X:	204.17 px	Y:	-243.4 px
Luma:	X:	-1.54 px	Y:	255.02 px

While the control points could be adjusted in the inspector, it is best to use the onscreen handles to control the adjustment.

Essentially there is a control point for Hue, Saturation, and Luminance. They select a central value and a range to be used by the chroma keyer. The further you pull them away from the center, the smaller the range. Drag around the circle to select the central value.

Click **Show Mask** to highlight the selected area. Drag the **Hue** control upward to begin limiting the range and you should see mask begin shrinking. Drag around the circle to select the desired hue until you have the best portion of the skin selected. Now do the same with the **Sat** control, dragging it downward and around the ring to reduce the mask further. Then the Luma control upward and around until you've isolated the skintones to process.



Without Texture



Add Texture



Depth 50



Depth 100



Light Angle 0°



Light Angle 90°



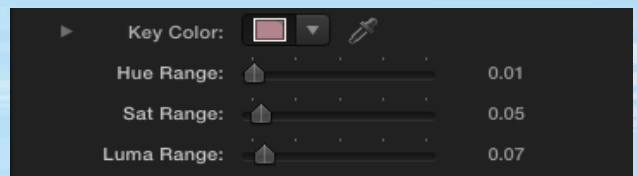
Conform Minus



Conform Zero



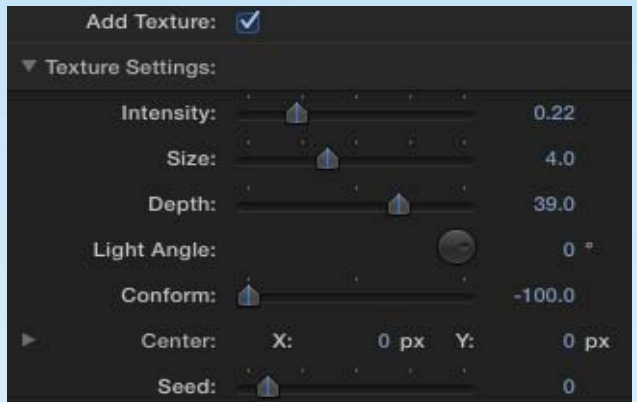
Conform Plus



If you selected Color controls, take the eyedropper and choose a color that seems about midrange for Hue, Sat and Luma. Turn on the Show mask, then adjust the HSL Range sliders to include as much of your image as you need. The higher the value, the more colors you will be including.

You can always tweak your color by using the HSL sliders in the System Color picker.

Whether you chose Color or On Screen Controls, you can adjust your mask using the controls described under the Chroma Keying overview above.



Sometimes, the smoothing levels necessary to remove imperfections can leave skin looking plastic and unnatural. **Add Texture** generates a random pore map to relieve the plastic look. It does add to render times, so shouldn't be enabled if unnecessary.

The best way to use it is to turn the **Intensity** up until the "pores" are visible and adjust the **Size**, **Depth**, the **Conform** (how much the pores try to follow the facial features, driven by luminance), and the **Light Angle** (what direction the light is coming from. Once you have adjusted it to your liking, reduce the **Intensity** until the effect is just barely visible.

Center is used to move the pore map around as the pore map does not actually know the underlying facial structure and the illusion can break down if the pores appear to remain in one place while the face moves beneath them.

Keyframing changes in the **Center** or using the host's built in tracking function to move the pores to track movement may help.

Seed will alter the random distribution of the pores.