

From DFX+ to Fusion

A compositor's guide to the differences between Fusion and DFX+.

DFX+ is a powerful image processing tool, with enough features and power to become a key part of the effects and animation pipelines in any studio. However, the full time compositor or dedicated film effects studio faces unique challenges that may not be addressed by DFX+

To accommodate these artists, eyeon produces Fusion, our top of the line multithreaded film compositor. Fusion employs the same intuitive and responsive interface found in DFX+, but adds special tools for dealing with film, expanded color support, and mechanisms for managing complex user environments.

Compositions created in DFX+ can easily be opened in Fusion, making it easy to move your project forward.

This document outlines the features and capabilities that are unique to Fusion 5.0 – these features are only available in Fusion – they cannot be found as part of DFX+.

Network Rendering

Any copy of Fusion can be used as a slave in a network render environment. This allows a copy of Fusion to become part of the render farm long after the artist has gone home for the night.

The modular nature of DFX+ makes it difficult to predict if a given copy of DFX+ will have access to all of the tools found in a composition, so network rendering using a copy of DFX+ as a slave has been disabled.

Color Depth

Fusion is able to process images in using both integer and floating point color space models. While 8 bit integer is often sufficient for simple video and DV effects, High quality video capture devices may benefit from the additional fidelity of 16 bit integer color processing.

Certain OEM models of DFX+, such as the version shipped with the Altitude, may provide 16 bit integer processing as an additional feature.

In addition to 8 bit and 16 bit integer color processing, Fusion adds two floating point color depths to the palette of options available to the artist. Floating point color not only provides for more subtle steps between colors, it also gives the artist the ability to deal with over and under exposure, by capturing and preserving the values of colors pushed below black and or above white.

As well as the mind boggling fidelity and accuracy of 32 bit per channel floating point color, Fusion also provides a less memory and CPU intensive 16 bit per channel floating point option.

Formats

The wider color depth capabilities of Fusion mean that it is capable of saving your images to a broader range of formats. Cineon, OpenEXR, TIFF, SGI are some of the formats that gain additional options in Fusion for saving your images at higher color depths.

While DFX+ converts 10 bit Logarithmic Cineon and DPX files to Linear images using default settings, Fusion gives the artist tools for choosing a specific black point, white point and gamma for the conversion.

Macros

Studios often develop special processes and techniques they employ regularly as part of the work they do. Procedures like converting NTSC to PAL, blurring UV channels, creating slates are examples that all involve several tools working together. Fusion allows the artist to create new tools called Macros which combine the functionality of several tools into one tool. Better yet, Macros can be customized to show only the most important controls, so a process involving 10 tools with several hundred controls can easily be simplified to one tool with 5 controls instead.

Better yet, macros created in Fusion can be employed by artists working in DFX+!

Double Polyline Masks

DFX+ already provides some of the most powerful spline masking tools for rotoscoping in the industry. Fusion adds to those capabilities by providing double edged polylines. These are special polylines carefully designed to address the rotoscoping artists worst nightmare; motion blur. By providing spline shapes for the inner and outer shape, the artist can apply varying amounts of softness along the perimeter of the spline shape.

Eyeon Software knows that rotoscoping is tedious and soul destroying work, so extra effort was made to ensure that double polylines didn't also create double the work for the artist. It is possible to take a single edged polyline and convert it to a double edged polyline, preserving any animation applied to the shape along the way. Points on the outer polyline are parented to the inner polyline so that you only need to apply extra keyframes where they are needed.

One example of how this feature can optimize a studios workflow would be to have a junior artist perform a rough rotoscope of a subject using single edged bezier or B-Spline polylines in DFX+, then have a senior finishing compositor convert the shape to a double polyline and refine the mask further using Fusion.

Advanced Geometry

The 3D environment in DFX+ has limited support for geometry, allowing use of primitive shapes like cubes, spheres, cylinders and more. Fusion increases the 3D environment's support for geometry by allowing the import of meshes in the OBJ or FBX formats.

Additionally, the artist can use the Import FBX utility with Fusion to create a composition containing cameras, objects, lights and animations matching the scene stored in an FBX file. This makes moving between 3D animation and 2D compositing easier than ever before.

Look Up Tables

Color calibration is important to the professional artist – ensuring that the colors seen on the monitor match the colors of the final presentation media is critical to success. Fusion lets the artist set one or more custom look up tables, or LUT's. The LUT curves can be used to tune the exact presentation of colors in each display view. Switching between different preset LUT's is no more complex than a simple click of the mouse, or you can disable LUT's entirely for a look at the raw image.

Fusion even lets the artist create custom macros to apply to views as LUT's. This could be used for complex color corrections, to overlay an image in the views, or even to apply a deformation to deal with lens distortion.

Sub Views

The key to successful color correction is information – the more the artist knows about the image, the better. DFX+ can show an image as RGB pixels, 2D and 3D histograms and even as a vector scope. Fusion makes it even easier to learn about the image by providing sub views, small windows in the corner of your display to show histograms and vector scopes simultaneously with the image.

Sub views can also host additional information about the image including color inspectors and image info.

Large Flows

Today's effect shots are much larger and more complex. Instead of a single artist, shots often require the input of several artist working in tandem. The node tree, or "flow" can also get quite large – sometimes containing hundreds of tools.

Fusion adds several capabilities to ease the way when collaborating on a shot. A comments tab allows a free form area for maintaining notes about the composition. Use the comments tab to keep a todo list, or to explain what the composition is doing to the next artist who needs to work on the shot.

Fusion also adds a navigator window to the top left corner of the Flow Editor. The navigator provides a graphical overview of the entire composition, making it easy to see what portion of the composition is currently visible, and where off screen tools can be found.

The Fusion flow also provides a utility that can search for tools in the composition by name, filename, or type.

Tools

Fusion also adds the following tools to the palette available to the artist.

White Balance

This tool helps “white balance” a shot automatically. The artist selects a pixel from the scene and then selects the color that pixel should have been. Fusion uses this information to automatically correct the image removing color casts and adjusting the overall tone. The tool support secondary corrections in the highlights, mid-tones and shadows, as well as a variety of color spaces.

An additional Color Temperature mode provides even more flexibility to this tool.

Gamut

The Gamut tool can be used to convert the color space of an image. Support is provided for more than 14 color models, including sRGB, Adobe RGB, CIE and SMPTE-C. This tool can also remove the gamma adjustment automatically applied to most digitally stored images.

Remove Noise

The remove noise tool provides simple grain management, filtering images to remove grain. Separate control over the Red, Green, and Blue channels gives this tool the flexibility to deal with any situation.

Cineon Log

When loading a Cineon or DPX file, Fusion provides the option of bypassing the log to lin conversion, preserving the raw data stored in the file. This lets the artist work with the tool natively in integer space without cropping the dynamic range of the image. Later down the pipe, when the color corrections are done, this tool can be used to convert the Log image into linear color space.

Light Trim

The Light Trim tool is specifically designed to emulate the behavior of a light trim table. It works with logarithmic film images, before the images have been converted from log to linear by the Cineon Log tool.

Change Depth

The Change Depth tool provides a mechanism for changing the color depth an image is processing at. For example, this tool makes it possible to load an image at 16 bit float color depth, apply color corrections, and then convert to faster 8 bit integer processing for transformations and other operations.