Dia²

Quick Start Guide

This guide covers installing and using Dia² in DaVinci Resolve.
Dia² also works with Baselight and Livegrade Frontier.

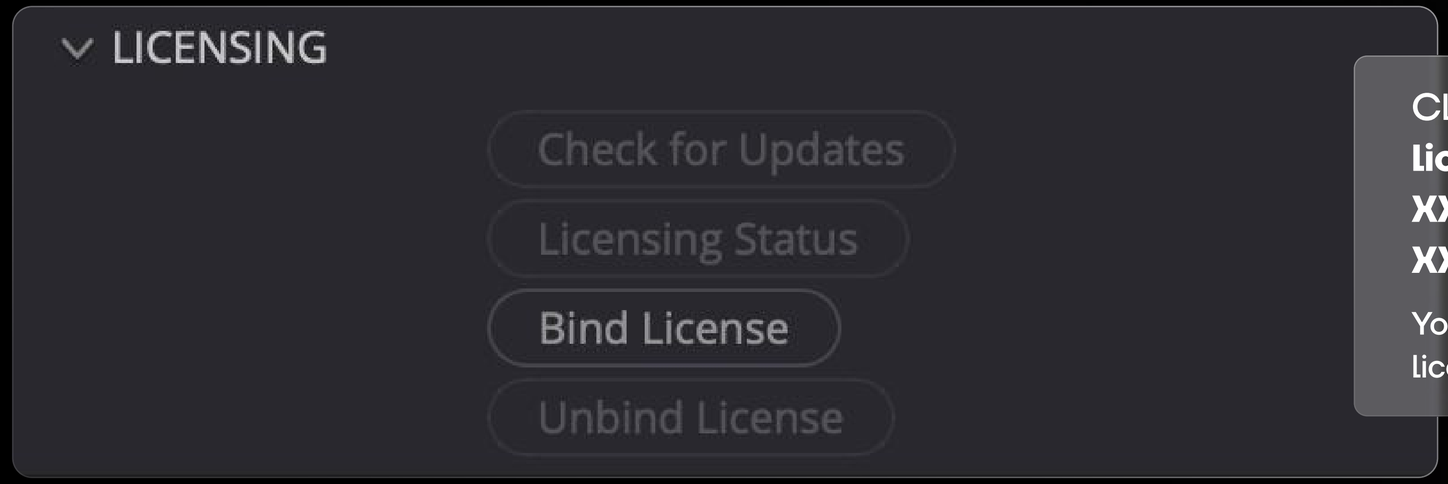
Installation and Licensing

You can **download Dia² from your account** on the HAL Picture website:

Dia²

Once installed, the plugin should appear **in the Effects Library of DaVinci Resolve's Color page.**

To activate a license, **drag and drop** *Dia²* onto a node **and scroll down to the Licensing tab**:



Click ***Bind License*** and **enter license key** (format: **XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX**).

You can use *Unbind License* to move your license to another device.

Color Management Setup

Color Management

Your project, your pipeline

Dia²'s internal Color Management lets you choose the workflow you want for your project:

- fully color-managed standards: ACES, RCM
- camera-based workflows
- log-to-log or direct-to-display options

direct-to-display

Select your **input colorspace**
Various working colorspaces and camera-specific colorspaces are available

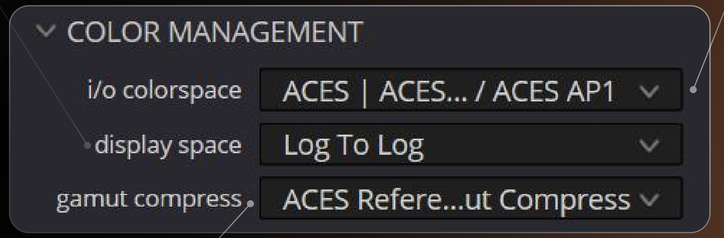


Select your **display space** (HDR and SDR formats supported)

log-to-log

Select "Log To Log"

Choose the colorspace that matches your workflow choices.



We recommend applying the ACES gamut compress once at the start of the colour workflow.
It can be applied here in the plugin, and it can be disabled if you decide to apply it somewhere else in your pipeline (via the project settings, via a color transform node...).

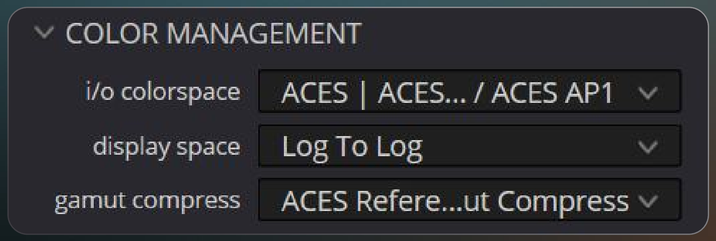
Make sure your Project Settings are set up accordingly.
Various use cases are detailed in the next pages.

Color Management Setup

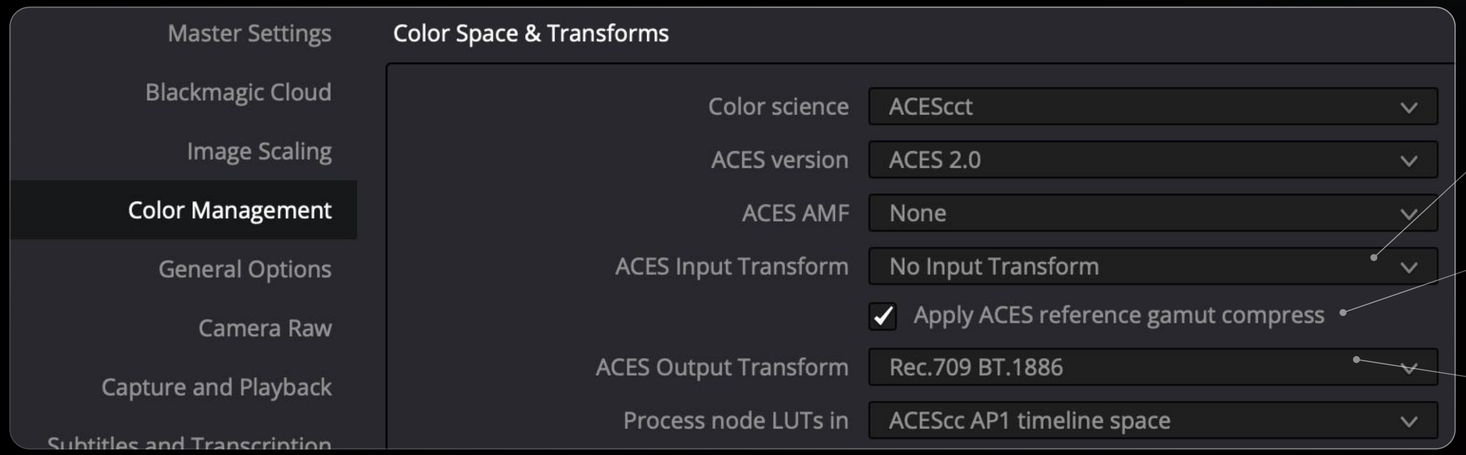
ACES workflow

Setting up an ACES-based pipeline with Dia²

In Dia²'s internal Color Management tab, **choose your ACES version** from the **i/o colorspace** menu.



Make sure your settings **are configured** accordingly in DaVinci Resolve Project Settings. For example, in an ACES 2.0 pipeline:



Choose the IDT corresponding to the color space of your source footage.

We recommend **using reference gamut compress**. Applying it here means you don't need to apply it in the plugin "Color Management".

Choose the ODT matching your destination color space.

You can use either ACES 1.3 or 2.0, but be aware that looks developed in 1.3 won't match when converting to 2.0 and vice-versa.
ACES 1.3 is offered for backward compatibility, **we strongly advise starting new projects in ACES 2.0**.
More infos on ACES: https://acescentral.com/

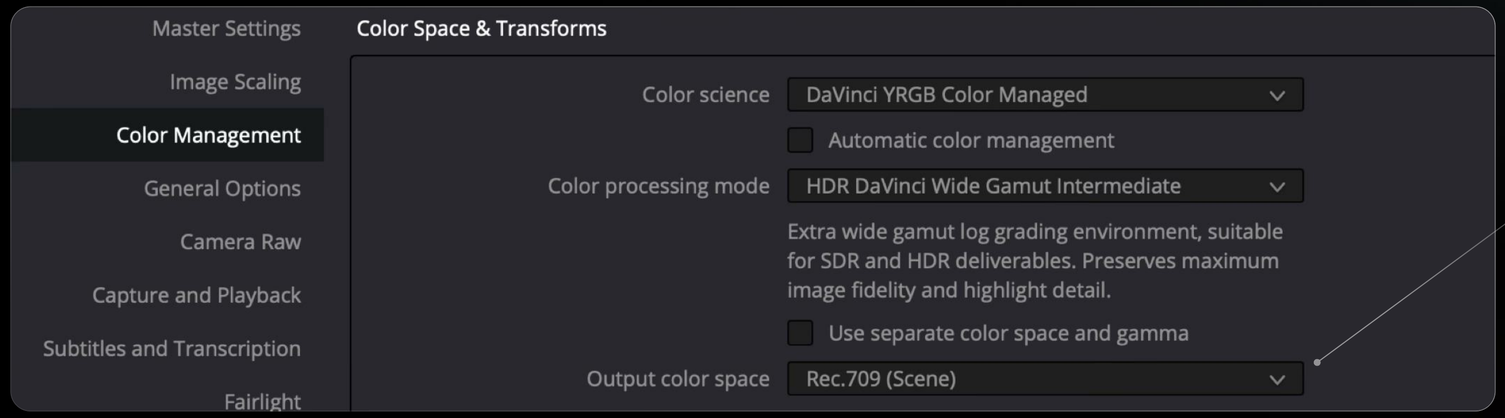
Project Setup

Color Management Setup

DaVinci ColorManaged

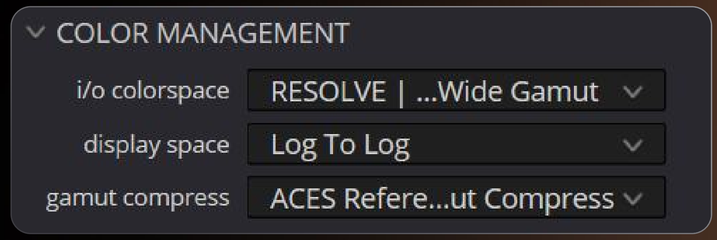
Working within DaVinci YRGB ColorManaged pipeline

To work in *DaVinci ColorManaged*, make sure your settings are properly configured in DaVinci Resolve's **project settings**.



Choose **the output color space** depending on your monitor.

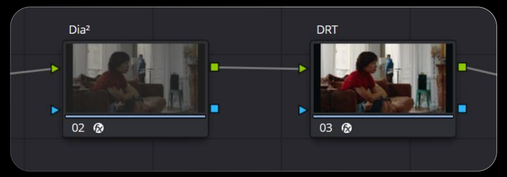
In Dia²'s Color Management tab, **choose Resolve in the drop-down menu.**
If you use multiple instances of Dia², we recommend **checking ACES reference gamut compress** on the first instance only.

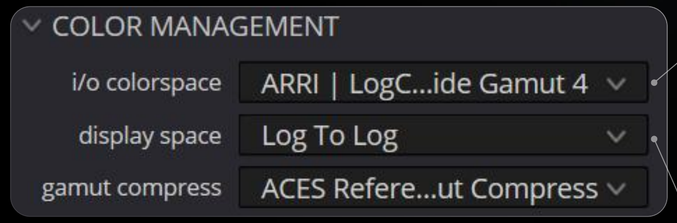


Camera Space

Grading in native camera color spaces

If you're working in native camera color space, with a custom DRT/Color Management, **you need to set up Dia²'s internal color management accordingly.**





Dia²'s internal processing happens in an ACES working space.
If you choose a log-to-log pipeline, your images will be converted back to your i/o colorspace before output.
If you choose a display space (SDR or HDR), Dia² will process your images with the appropriate ACES Output Device Transform.



Choose **the OETF/colorspace matching your grading color space.**

Supported color spaces:

- ARRI LogC3 / ArriWideGamut3
- ARRI LogC4 / ArriWideGamut4
- RED Log3G10 / REDWideGamutRGB
- SONY Slog3 / Sgamut3.cine
- PANASONIC V-Log / V-Gamut
- BLACKMAGIC BM Gen.5 Film curve / BM Wide Gamut RGB
- DJI D-Log / D-Gamut
- APPLE Apple Log / Rec2020
- APPLE Apple Log 2 / Apple Wide Gamut
- CANON Canon Log 2 / Cinema Gamut
- CANON Canon Log 2 / Rec2020
- CANON Canon Log 3 / Cinema Gamut
- CANON Canon Log 3 / Rec2020
- FUJIFILM F-Log2 C / F-Gamut C
- NIKON N-Log / Rec2020

Since the internal color science of Dia² relies on ACES, **ACES gamut compress should be applied at least once at the start of your look pipeline**, unless you're applying it somewhere else.

LookDev Setup

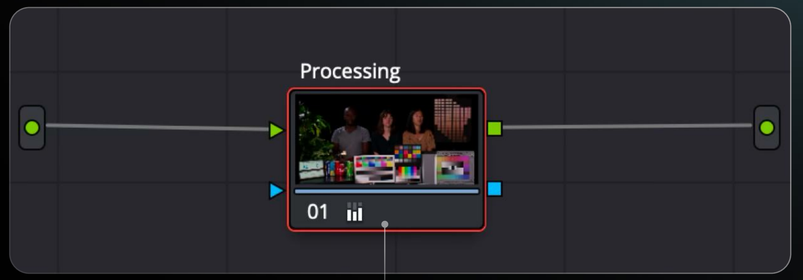
A base template and advice for look development

Put the look at the end

Look transformations should happen at the end of your pipeline, so that all your shot-by-shot modifications (grading, etc.) use the richest data possible.

This is why we advise **setting up Dia² in a Group Post-Clip or Timeline node**. This logic is valid for our other plugins and any other look development tool.

Clip node graph



Timeline or Group Post-Clip node graph



Basic dailies processing:
- Color temperature
- Tint
- Exposure

Dia²

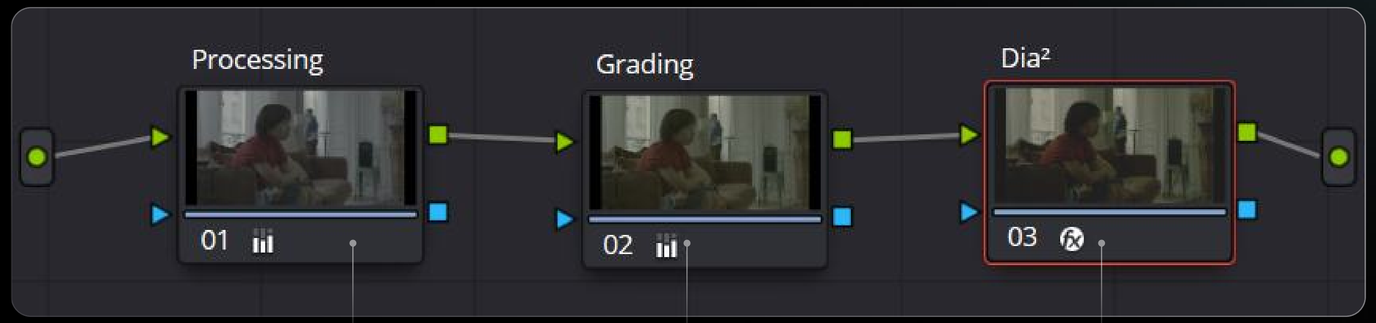
Use balanced, varied footage

A Look must be versatile and work on a wide variety of footage. We suggest using a timeline with **diverse material and test shots** for your project. While creating your looks, don't forget to jump between different footage to make sure you're not compensating for something that is shot-specific.

All sample shots must be correctly balanced (**white balance, tint and exposure**). We recommend doing this processing in the *Camera Raw* module when working with RAW footage.

Color Grading Setup

A basic node graph structure to use Dia² in a color grading context



Basic dailies processing:
- Color temperature
- Tint
- Exposure

Color Grading Node(s)

Dia²

Note that **the order of operations** inside Dia² is the following:

1. Exposure (inside Color)
2. Diffusion
3. Definition Vignetting
4. Halation
5. All Color operations
6. Spatial Equalizer
7. Grain

You can also move the look nodes to the Timeline or Group Post-Clip level.

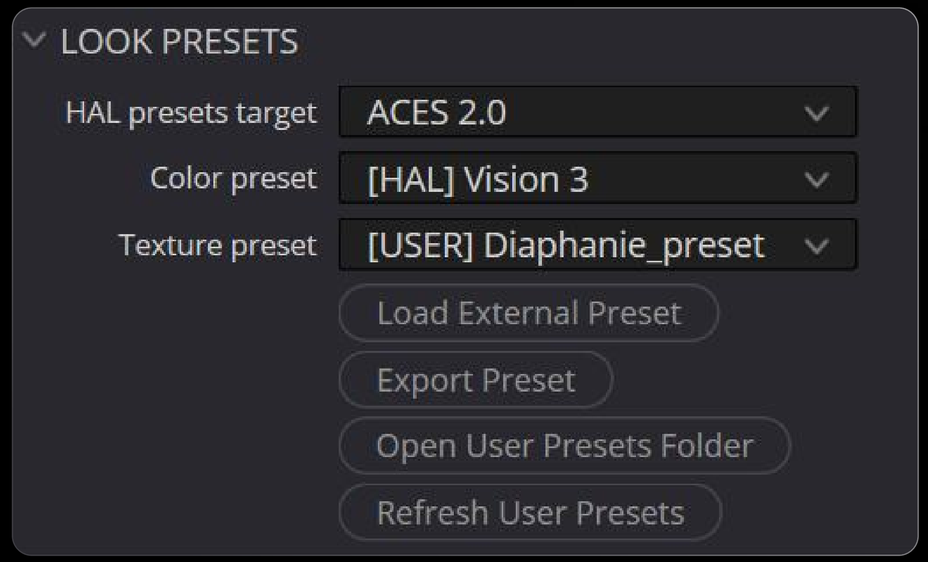
This node graph is a basic structure to grade through the look.

Look Presets

Load and export look presets

You can save the current Dia² settings **as a preset stored** in an .xml file using **Export Preset**.

To load a new preset, (**Color** or **Texture**), click **Open User Presets Folder**, drag and drop your preset, then click **Refresh User Presets**. Your preset will be available in the drop down menu.



In the drop down menu you can find **the .xml presets** in your user folder and built-in presets.

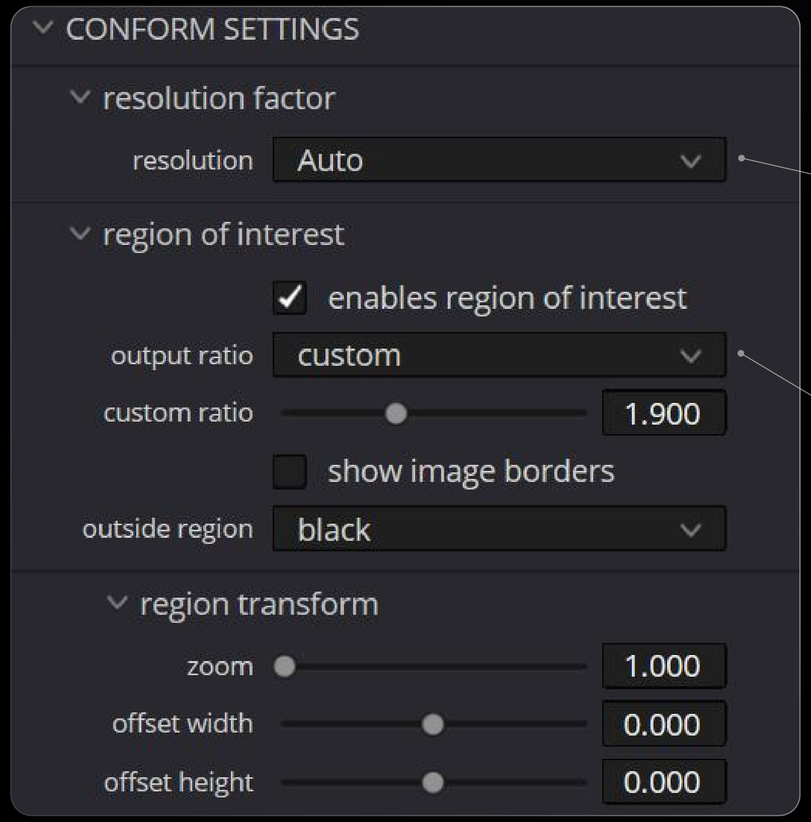
The **HAL presets target** menu lets you choose between different built-in preset flavors depending on the DRT you are using.

Built-in presets include a wide variety of **pre-made looks** that are good starting points for your look development journey ! You can also import/export looks **from/to *Diachromie* and *Diaphanie***.

More on built-in presets here.

Conform Settings

Make sure Dia² knows about your project's specifics



The Conform Settings panel allows you to configure the plugin for your project. It's really important to choose the right settings to make sure that the plugin works properly.

Resolution factor needs to be set in accordance with the resolution of your timeline. If you import your texture look into another timeline of a different resolution, changing the resolution factor will allow textural effects to be resized accordingly. Keeping it in **Auto** will ensure stable results as the plugin will auto-detect the size of your timeline.

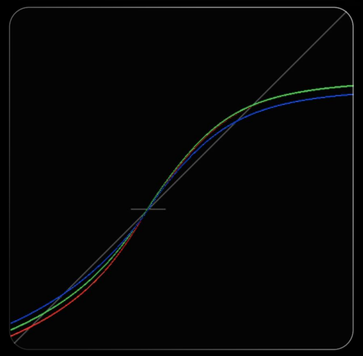
Region of interest lets you ignore certain parts of the image, typically burnt-in blanking. Note that everything outside the region of interest will be set to black.

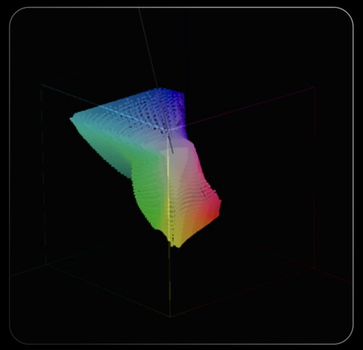
You can use **show image border**, **custom ratio**, and **region transform** to fine tune the blanking.

Monitoring Tools

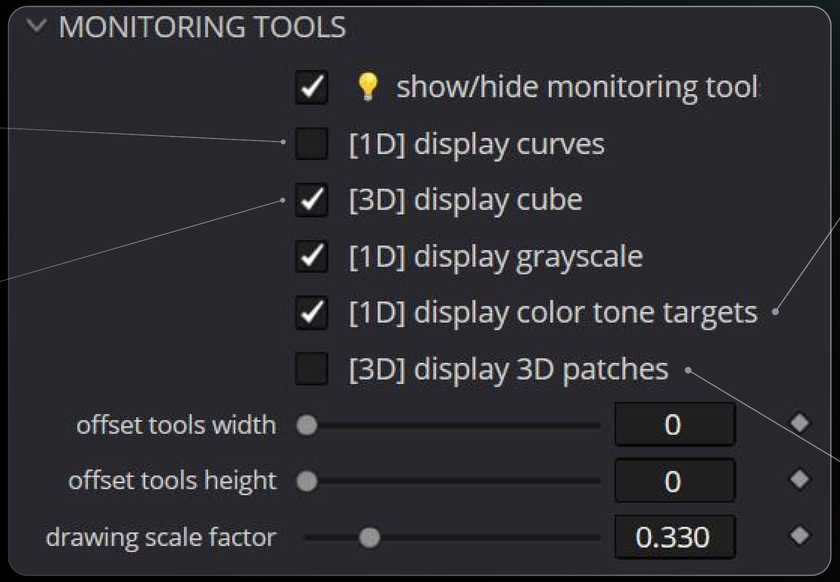
Overview

Display RGB Curves

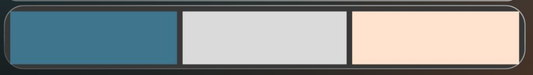




Display 3D transforms in an AP1 RGB Cube



Show hue targets for Color Tone Curve module (see p.14-15)





Show color palettes to monitor color transformations

Feel free to explore all the other monitoring tools and options.

Color Transformations

Overview

Color Transformations contains all the tools you need to **shape the color part of your look.** The order of the sections is not the internal order of operations but an intuitive order for look development.

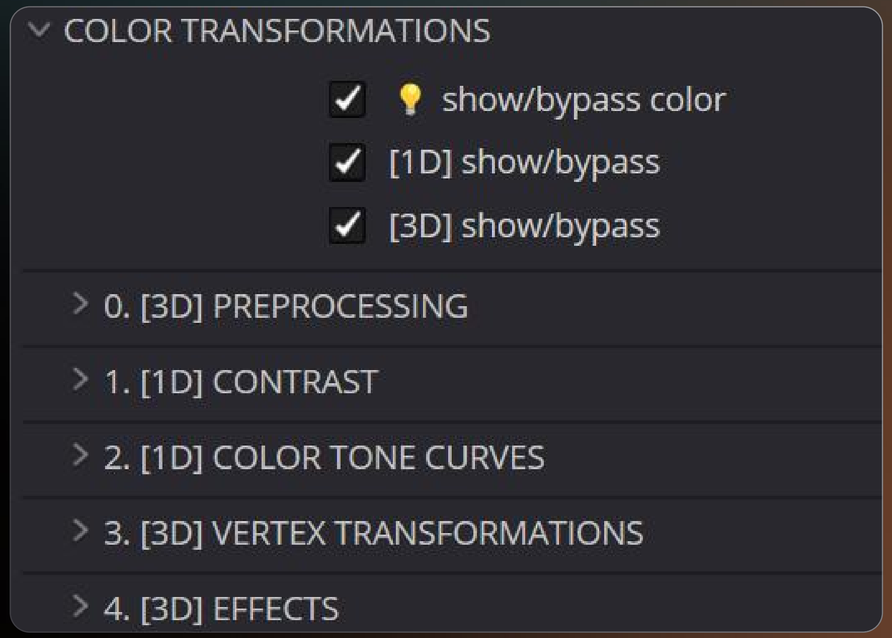
The **[3D] Preprocessing** section lets you apply **filmic pre-processing** to your image or design a specific **monochrome** look.

The **[1D] Contrast** section addresses **the tonal curve** of your look.

The **[1D] Color Tone Curves** section is dedicated to **fine-tuning dominant colors** in the shadows, midtones and highlights, as well as a global set of modifications to tint the image.

The **[3D] Vertex Transformations** section is the most complex set of tools. It is designed to **define the color palette of your look** by shaping its color cube. It includes transformations that affect the behavior of the color in 6 predefined zones covering primary and secondary colors.

The **[3D] Effects** section offers a Bleach Bypass effect and a Color Unifier effect.



1D: Contrast Curve

Overview

The **Contrast module** allows you to fine-tune your tone curve. All the tools (except exposure) **preserve middle grey** as a look shouldn't generally change exposure.

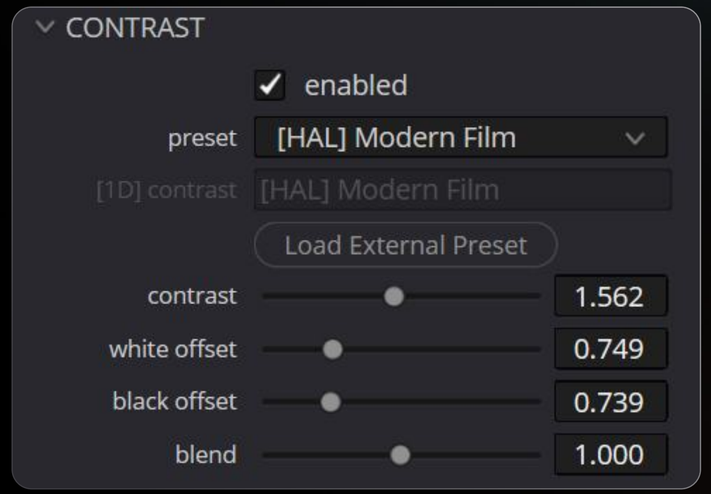
The **Contrast slider** sets the main slope of the curve around middle grey.

Use **White Offset** to shape the shoulder of the curve.

Use **Black Offset** to shape the toe of the curve.

The **Blend slider** lets you blend the effect of the contrast module. Note that it can be pushed further than 1.

Exposure slider applies an exposure offset in stops.





1D: Color Tone Curves

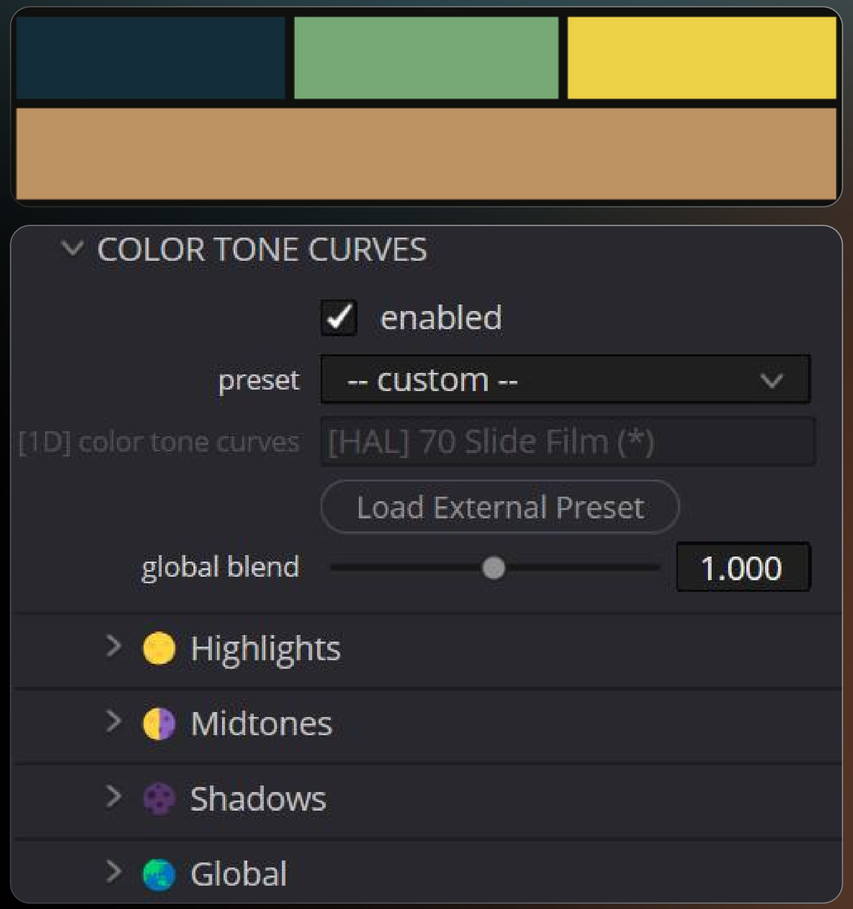
Add color casts and tints

The Highlights, Midtones and Shadows sections allow you to add color tints in the corresponding zones of the look. They all have the same set of tools.

The Global section lets you add an overall cast to the look.

In the Monitoring Tools, you can display the hue targets to help you pick your hues.

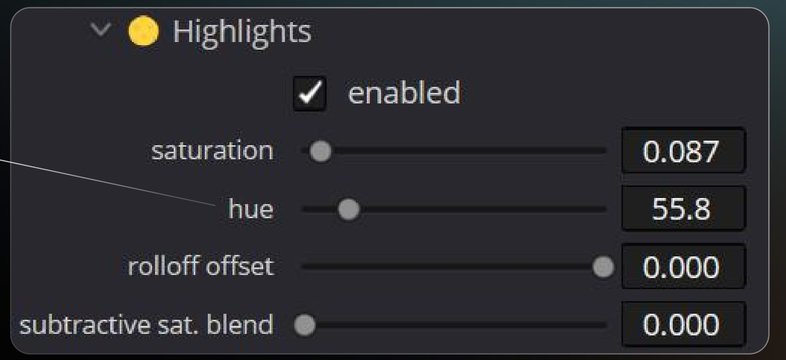
The **global blend** blends the effect. You can push it over 1 to accentuate the whole transformation of the module.



1D: Color Tone Curves

Highlights example – Modern Film





Here **the color tone targets** are displayed (see p.11) to visualize the target hues using the **hue slider**.

Control the dominant color strength using **the saturation slider.** You can choose to protect the brightest parts of the image using **rolloff offset**.

Subtractive sat. blend changes the default behavior of the module by decreasing lightness when saturation increases.

3D Vertex Transformations

Overview

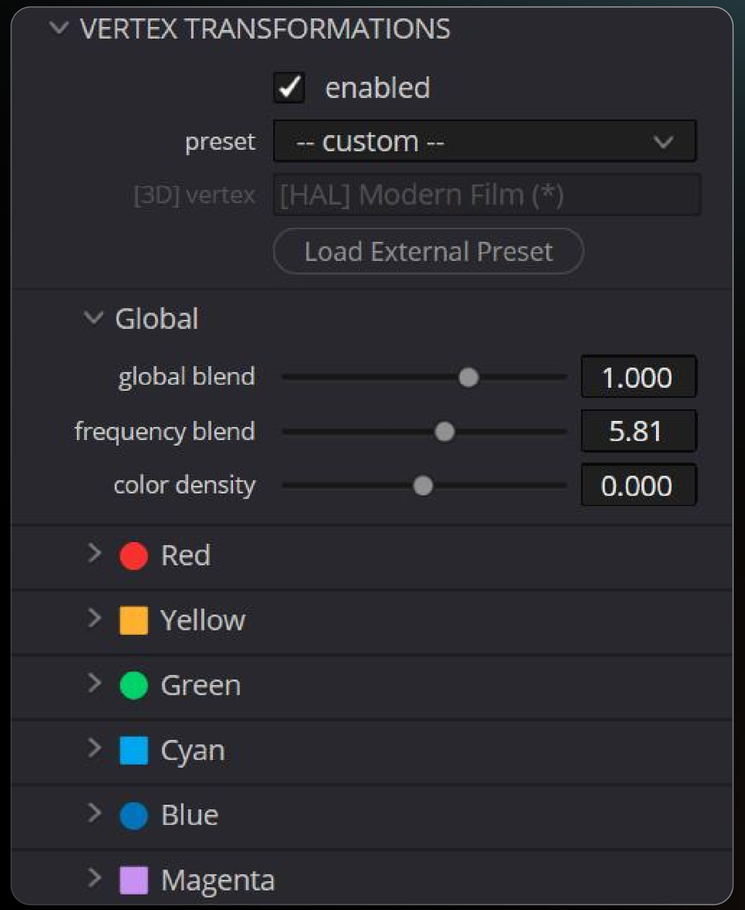
The **[3D] Vertex Transformations** let you shape the color cube. Each vertex (Red, Yellow, Green, Blue, Cyan, Magenta) has the same set of tools.

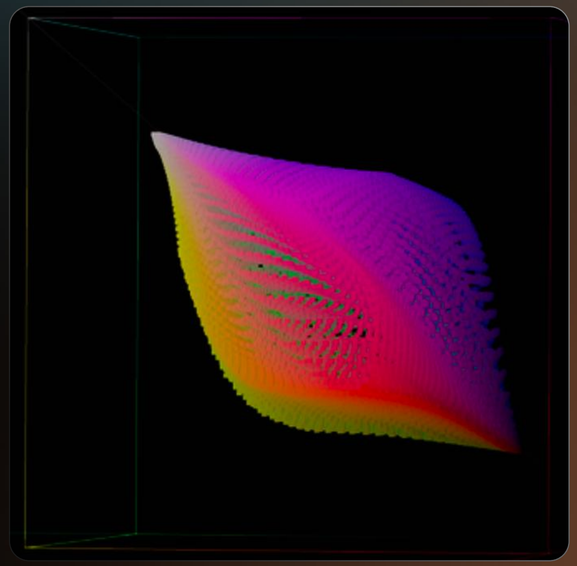
The **global section** lets you apply those tools to all the vertices at once.

Global blend blends all the transformations of the module and can go over 1 to increase the effects.

Frequency blend blends the transformations on low frequencies. It limits their effects on fine details to avoid noise-related issues.

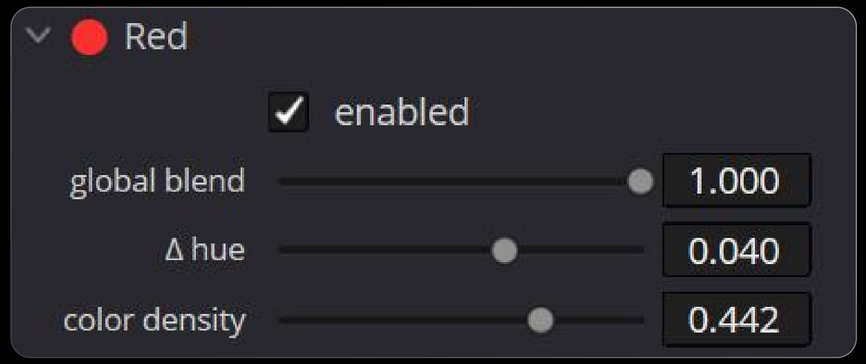
Color density increases or decreases the lightness of saturated colors.





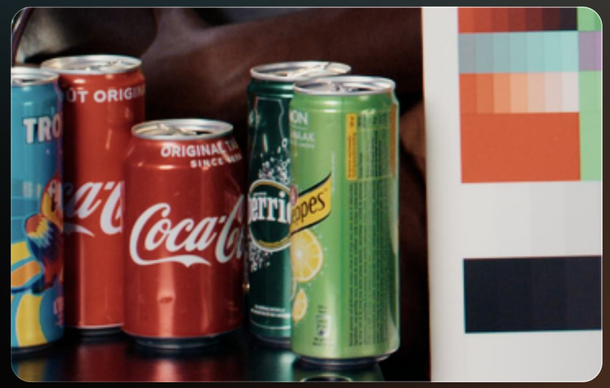
3D Vertex Transformations

Modern Film - Red Vertex example





Red vertex disabled



Red vertex enabled

Each vertex has **the same operators**, but each affects only its own zone of the cube.

As you can see in the before/after illustration, by working on the red vertex of the cube, we can easily make the reds **denser** and add a slight **hue shift** toward orange, typical of film emulsions.

Effects

Bleach Bypass

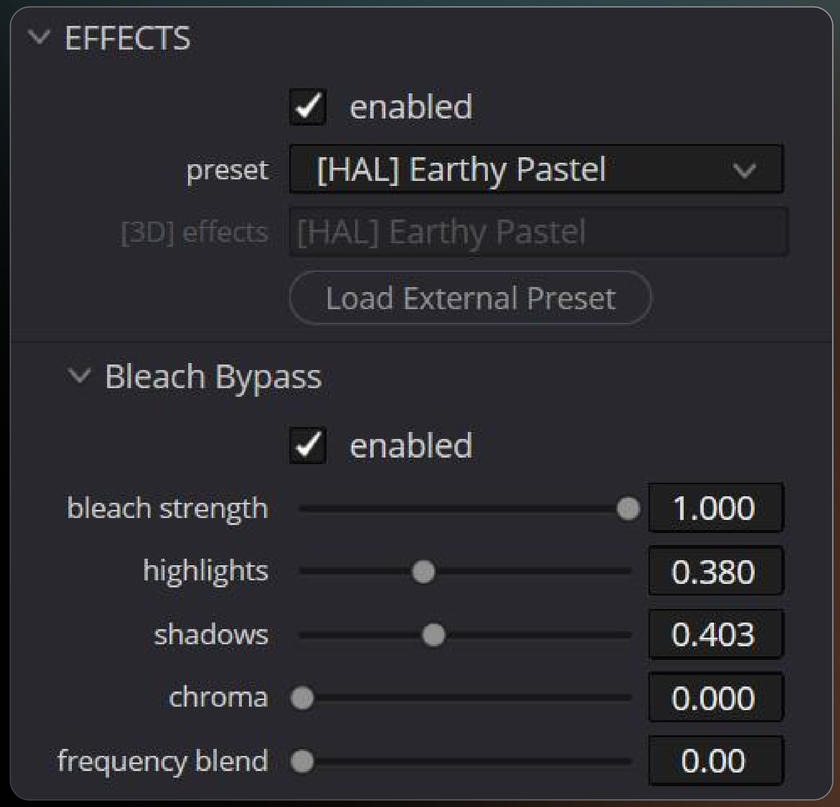
***Dia²* features a parametric bleach bypass effect.**

Bleach strength lets you control the global strength of the effect.

Highlights and Shadows let you control the strength of the effect on specific regions.

Chroma lets you apply the effect only over a certain chroma threshold. The default value (0) applies the effect across the whole chroma range for a film-like bleach bypass effect.

Frequency blend allows you to reduce the effect on the higher frequencies, if it introduces artefacts.



Effects

Color Unifier

This effect allows you to **pick a color** (by selecting its **hue, saturation** and **brightness**) and to **pull neighboring colors toward it** using the **strength** slider.





Notice here how the blues of the jacket and the hoodie are pulled toward the same color.

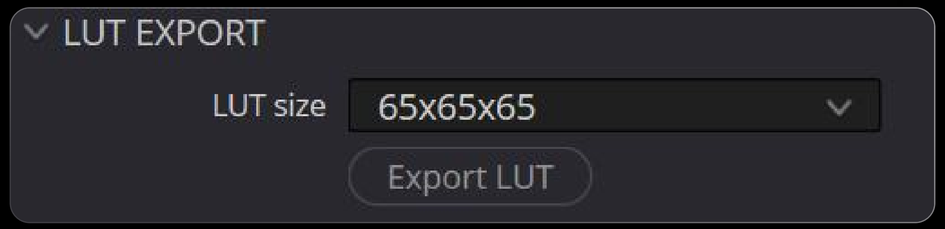
LUT Export

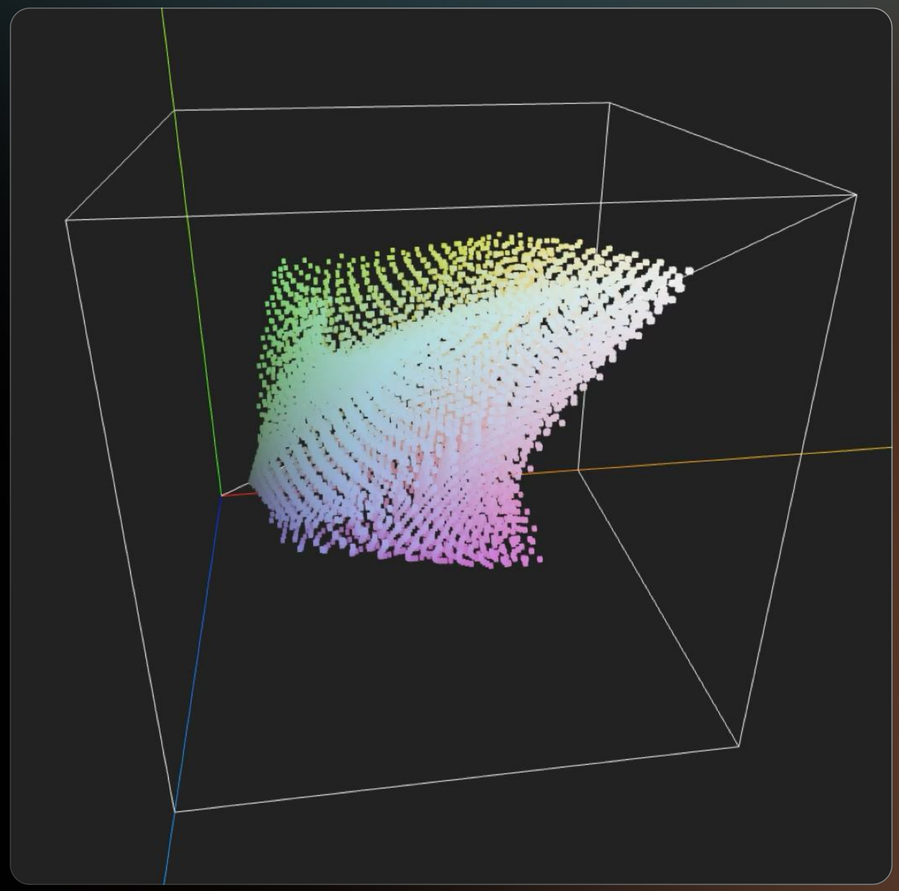
Internal LUT export

You can export your look as **a 3D .cube LUT** in the **LUT Export** tab.

As with every LUT, this LUT will include **only the color transformations**, not the textural ones.

The generated LUT will include all the Color Management processes that are set up in the Color Management tabs (*p. 3-6*).



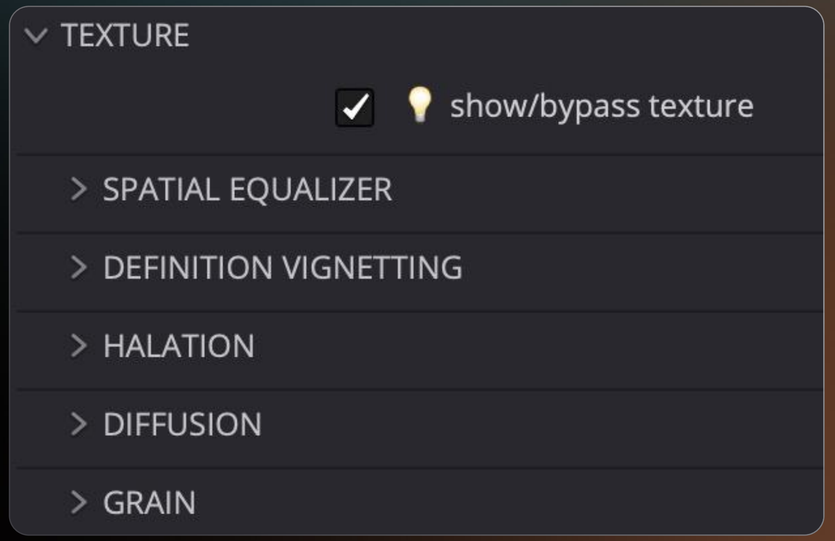


To export a camera LUT with Resolve's built-in LUT export, *refer to the user manual.*

Texture

Overview

The *Dia²* Texture module is composed of 5 independent submodules that shape the texture of your look:



The Spatial Equalizer module is dedicated to working on spatial frequency, allowing you to adjust the spatial resolution of specific levels of detail.

The Definition Vignetting module allows you to create a signature vignette, inspired by famous lens looks.

The Halation module emulates the film-related halation phenomenon, reproducing the light contamination that occurs between very bright areas and their adjacent regions.

The Diffusion module emulates optical diffusion filters.

The Grain module lets you apply a fully generated, procedural grain to your image. The grain is highly parametric, allowing you to achieve a wide variety of effects — from authentic film grain emulation to a more digital-looking texture — with careful parameter adjustment.

All these textural modules are also present in ***Diaphanie*** with more controls. Presets built using *Diaphanie* can be **imported into *Dia²*** and vice-versa.

Spatial Equalizer

What is spatial frequency ?

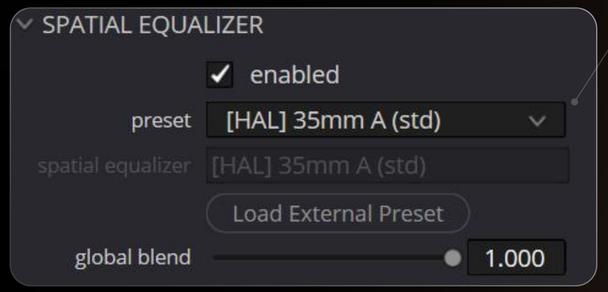
Images can be represented in the frequency domain, where each frequency corresponds to a specific level of detail in the image.

The frequency representation isn't visually meaningful on its own, but **it becomes powerful when you manipulate it**. For example, if you apply a high-pass filter (which preserves only the fine details) and then convert the result back to the spatial domain, you'll obtain **a behavior similar to edge or contour detection**.

In *Dia²*, you can use presets that apply specific transforms in those frequency bands. You can also **Load External Presets** from *Diaphanie* where you can work more precisely on those frequency bands.



Representation of three frequency bands, similar to a band-pass filter in audio processing. Low spatial frequencies (on the right) can be interpreted as the overall spatial structure of the image, and higher frequencies (on the left) correspond to finer details and variations in the image.



Built-in Presets:

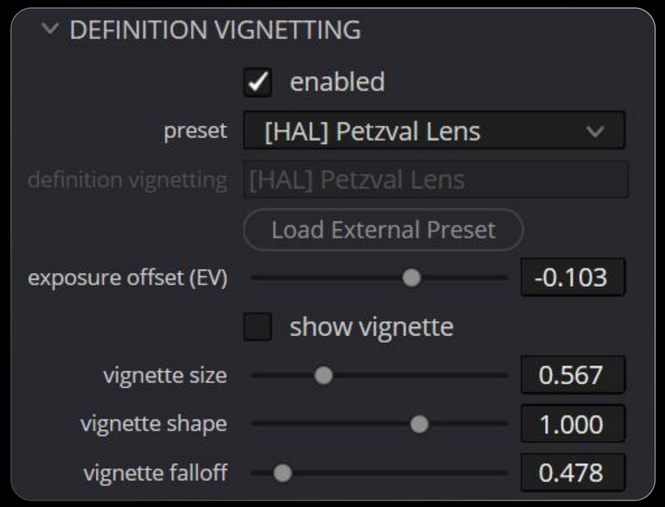
Filmic Looks
- 16mm A (std)
- 16mm B (alt)
- 16mm C (rough)
- 35mm A (std)
- 35mm B (soft)
- Amateur film

Digital Looks
- Velvety Grain
- Digital Haze

Lens Looks
- Vintage Lens

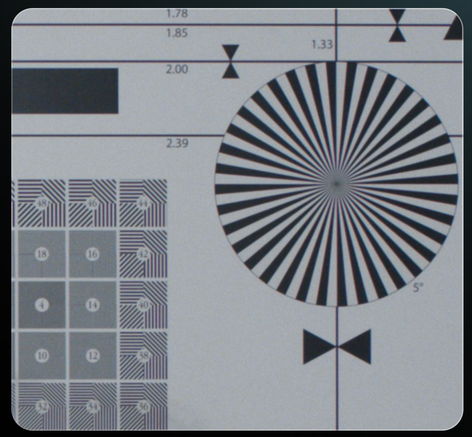
Definition Vignetting

This module allows you to reproduce vignetting effects inspired by typical lens behaviors. Just like a lens, **it interacts with the frequency content** of your image.

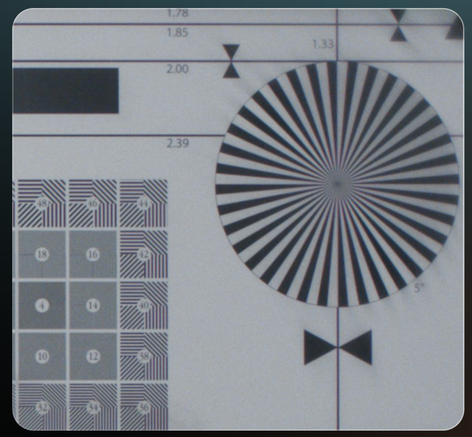


Built-in Presets:
Lens Looks

- Anamorphic
- Darken
- Petzval Lens
- Regular Spherical Lens
- Vintage Lens
- Washing Machine
- ...



original image (cropped)



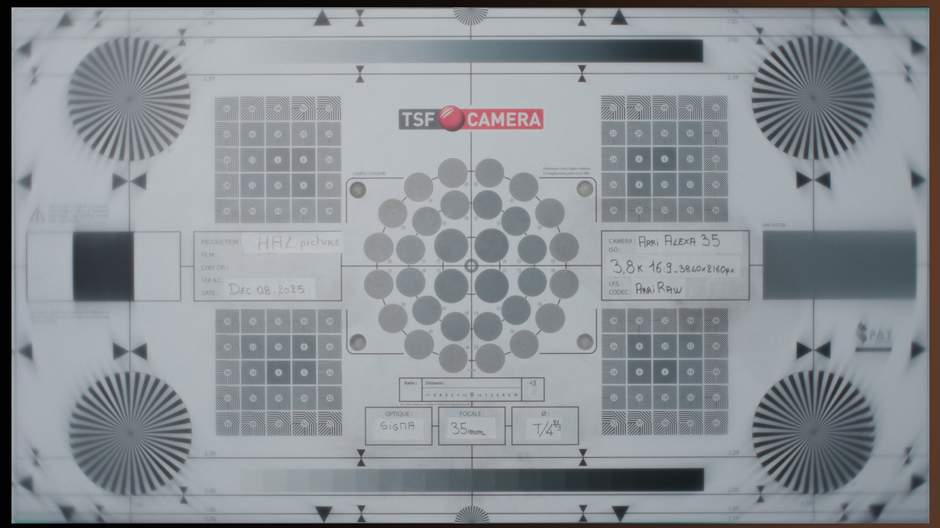
Definition Vignetting enabled



vignette shape

The **exposure offset** sets the vignette's exposure in EV.

You can control the shape, falloff and offset of your vignette. Note that the falloff can be used as a form of global blend.



Petzval Lens Preset enabled.

Halation

What is halation?

Halation is a **phenomenon present in film** due to various properties, like its thickness, the diffusing nature of the gelatin substrate and the reflection of the light on the film base. It typically **produces a red-yellow halo around highlights**. Historically considered a defect that manufacturers tried to minimize, halation is nowadays viewed as an interesting aesthetic effect.

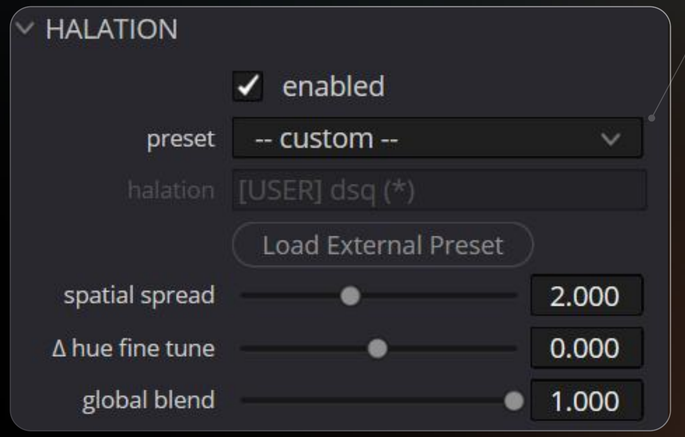


Kodak Vision3



Dia² (with a filmic preset)

The Halation component of *Dia²* is designed to let the user replicate typical film halation or try new digital-looking effects.



Built-in Presets:

Filmic Looks
- 16mm A (std)
- 16mm B (alt)
- 16mm C (rough)
- 35mm A (std)
- 35mm B (soft)
- Amateur film

Digital Looks
- Velvety Grain
- Digital Haze

Lens Looks
- Vintage Lens

The **spatial spread** slider allows you to choose the size of the effect.

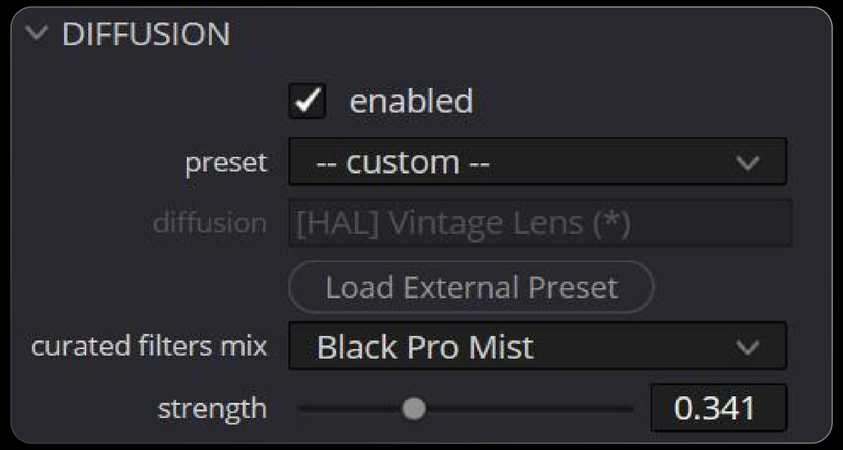
The **hue fine-tune** slider allows you to control the color of the halo, from yellow to orange.

Diffusion

The **Diffusion module** emulates the effect of optical diffusion filters.

You can either load a preset (built-in by HAL or provided by a user), or use an option from the curated filters mix.

The **Curated filters mix** lets you choose between specific builtin presets that affect the **radius, strength** and **halo/flare** aspects of the diffusion. Other [HAL] presets can also alter color temperature or saturation. These presets mimic the typical behavior of well-known optical diffusion filters. They are based on the analysis and comparison of test shots with and without the corresponding filters.





Black Pro-Mist 1/2 or Dia²?

Grain

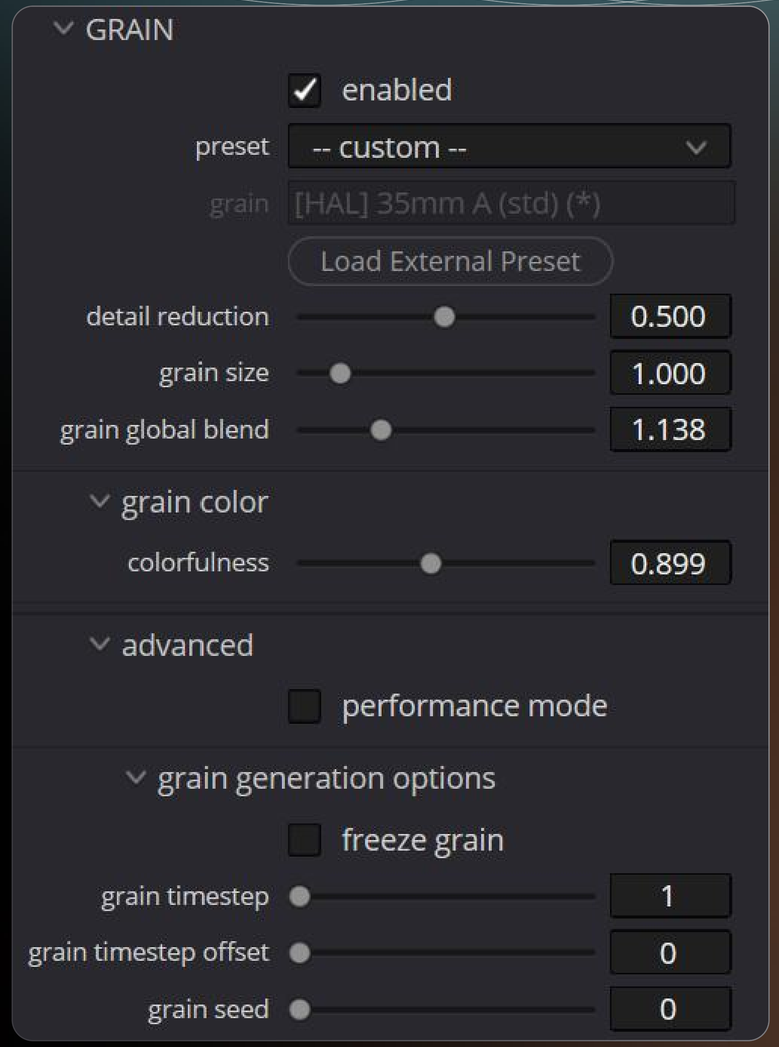
Dia²'s grain module allows you to achieve accurate film grain emulation, as it is based on film measurements, as well as more digital, never-before-seen textures.

Detail reduction is an important tool, as it allows you to remove details finer than the grain. This helps the grain feel like part of your image.

Grain colorfulness allows you to remove or add color to the grain without changing its brightness.

Performance mode speeds up rendering dramatically by using 1024×1024 tiles instead of full resolution planes. Please note that in this mode, the grain pattern may be visible in a paused frame.

Grain generation options are particularly useful for stop-motion and any other kind of **animation**.



What's next ?

Going further

You're ready to **start experimenting with** *Dia²* !

Here are some suggestions to boost your *look development* journey:

- **You can find advanced information on each module** in the documentation of Diachromie and Diaphanie
  Some sliders won't be available in Dia², but you'll get more detail on how each module works

- **Check out our YouTube channel** for look development tutorials and educational content

- **Practice on varied reference footage**
  Camera manufacturers offer RAW sample shots on their websites

- **Need help?** After reading the FAQ, feel free to e-mail us at help@hal-picture.com



