Managing Colour in Production

Your guide to industry leading colour control with ACES

Discover the disguise xR solution: disguise.one
What you’ll learn

This e-Book explores disguise’s approach to managing colour in live production. Discover the importance and benefits of our colour calibration tools, and our commitment to colour consistency, with industry standard support, via the Academy Color Encoding System (ACES).

• The importance of Colour Calibration
• How does Colour Calibration work?
• What is ACES?
• The disguise ACES pipeline
• Our partnership with Epic Games and Unreal Engine
• The disguise benefit
• Next steps to mastering colour with disguise.
As disguise continues to expand support for future production workflows across Live, Film, TV and Broadcast, the importance of colour consistency and continuity remains paramount.

We see ACES as the starting point for enabling more creative choice and technical flexibility for all users and verticals. This, combined with our advanced colour calibration tools emphasises disguise’s commitment to mastering colour in live production.

ACES was created by the industry to address the need for a common method of colour representation and management, that takes into account both the scientific and artistic demands.

With the adoption of ACES we now have the basis for managing visual data from many sources and transforming to a common representation for processing and output.

This is particularly important as we see more virtual production and mixed mode in camera visual effects (ICVFX), combining with traditional shooting and post processing work. In xR, for example we need to manage colour for rendered content, delivered to LED and ingested by an observing camera, to match existing footage.

**Ed Plowman**
disguise CTO
What is Colour Calibration?

Colour calibration is a critical stage in the disguise colour pipeline and is vital for creating a realistic xR illusion or cinema quality ICVFX.

Multiple cameras on set will capture the LED or projection surface from different angles which results in colour shifts. Additional set lighting and prop surfaces can also affect how colour is captured in camera.

Calibration ensures that the final captured colour is uniform and that your footage is displayed and captured as expected.

disguise automates the process of calibrating the colours represented on the stage (including set extension & AR, if used) to create a seamless output. The calibration process creates a common working colour space for all sources and corrects for colour issues.

disguise’s colour calibration process simplifies what is otherwise a laborious task and delivers results within minutes.
To understand the importance of colour calibration, let’s take a closer look at the pathways for colour that exist when working with in-camera visual effects.

All of these complications for colour consistency can be addressed using the disguise colour calibration tools.
Let's Calibrate

In order to match the virtual and real worlds together, we need to calibrate the colour response of the LED screen and camera pairing.

The disguise Colour Calibration tool runs through the gamut of the LED screen and learns the response of the sensor on the camera to those colours.

This is an automated process that takes under 5 minutes to complete, and results in a seamless blend between virtual elements and on-screen elements.

Find out more about Colour Calibration
What is ACES?

The Academy Color Encoding System (ACES) is an open, device-independent color management and image interchange system, developed at the Academy of Motion Picture Arts and Sciences.

Designed to simplify colour management, ACES has become the standard in the film industry and has an increasingly large footprint in broadcast.

The ACES colour space encompasses almost every current colour space, enabling consistent linear colour representation throughout the entire pipeline ensuring a consistent colour experience that preserves the vision of the creative team.

“The wider dynamic range and extended colour information of ACES gives you the confidence that your source material is preserved at the highest quality throughout the workflow.”

Raed Al Tikriti
CPO
disguise

Managing colour in Production: Industry leading colour control with ACES
Colour for the Future

Work better across formats and industries

ACES is supported by almost every major digital content creation package and is now supported in disguise Designer software.

All parts of the creation pipeline can be worked on in parallel to final colour, with the final look being able to be applied at any point without unexpected colour shifts.

With ACES enabled in Designer, Colour Lookup Tables (LUTs) have a pre- and post-transform option. This allows you to specify which colour space the LUT expects to receive and which space will be output from the LUT. Designer converts content safely into its internal ACES AP0 colour space, allowing you to perform transformation or add creative control, before the final output.
ACES can be used on any type of production from digital film-based production workflows and visual effects to Television broadcast and commercials and events. All production environments benefit from the precision and standardization that ACES brings.

The benefits of ACES

Combining the legacy power of the disguise Designer workflow and hardware with the integration with ACES now allows you to **transform and compose content from multiple ACES sources**, creating consistency when colour spaces are mixed.

ACES leads to better interoperation with VFX, quicker look iteration and predictable results when utilising LUTs.

Further reading on ACES
“In my last shoots I’ve been working with the ACES workflow, and the results have been really good!

This feature is a great tool for all of us in the production process - the VFX team has less work to transform the plates, and I have more dynamic range to adjust in the screens. I’ve been doing some tests with a colorist to compare and the conclusion is that it is working perfectly.”

David Monguet
Founder & CTO, MO&MO Film Services
Top five things to know about ACES

1. **Create photorealistic scenes of the highest quality, detail and framerate** without worrying about colour consistency.

2. **ACES unlocks the potential of your colour sources.** With disguise Designer you now have support for all major input and output transform types - including camera native transforms, ACEScg, HLG and PQ.

3. **Preserve the highest level of image quality** throughout the entire workflow and content pipeline.

4. With ACES integration you can be confident your creative vision is preserved. **disguise integration with ACES will take care of all of that for you.**

5. **Colour consistency for all productions**, from film and VFX to TV Broadcast and commercials, ACES is a standardized and easy to use workflow that will benefit any production.
ACES For Virtual Production

With the meteoric rise of virtual production, the need for teams across production to operate in a consistent colour space is paramount. From VFX artists to the director, ACES ensures all eyes are seeing the desired pixels at every step of the process.

The disguise benefit

Designer composites any video, live camera, or virtually rendered content onto your LED screens, without having to re-render into a specific colour space. ACES transformed footage can be integrated seamlessly into your pipeline.

This allows you to work with a wide range of industry standard software, across multiple teams, with graded and composited content converted to a wide range of display standards from within Designer.
“We believe standardized colour management is crucial to achieving high image quality and allowing for consistent creative authorship. This has become increasingly important as virtual production practices have introduced new and unique challenges in this space. With a trusted open standard such as ACES in place, filmmakers can focus on creating and shaping their images and have confidence that their intent will be maintained through the entire production process.”

Carol Payne
Creative Technologies, Netflix
ACES For Live Events

End to end content control for brands and artists. The ACES workflows in disguise enables confidence in content reproduction across the entire pipeline. Whether you’re creating an aesthetic for a brand, or producing content to match the needs of a brand, ACES ensures the colour stays consistent.

**The disguise benefit**

Designer can take any content, mix multiple media sources and be consistent across your displays. It fits in seamlessly with your live show.

The latest Designer software includes improved colour calibration tools and a new and expanded range of ACES compliant input/output transforms and gamma formats for your content.
Delivered in Partnership with Epic Games

In 2020 Epic Games awarded disguise a MegaGrant to revolutionise production workflows and enhance the interoperability between disguise and Epic’s Unreal Engine.

Our partnership with Epic allowed us to embark on groundbreaking new research to dramatically empower how real-time video content is delivered across various applications.

Working closely with Epic has enabled us to develop our ACES workflow to support Unreal Engine’s capabilities.

Realtime rendering at the highest quality
With RenderStream layers and Unreal, you can push up to 12-bit, rec.2020 content, direct to Designer.

Deliver consistent colour via RenderStream
Unreal’s ACES Filmic Tonemapper allow you to deliver cinema quality ACES content to your disguise stage via Renderstream.

Confidence in colour, at scale
The disguise Cluster Rendering solution ensures the highest quality visuals.
The disguise benefit

Preserve your vision

No other media server is integrated with ACES, this with Renderstream and clustered rendering is only the beginning of our commitment into high end and virtual production workflows and technology.

Overall better interconnection when either working on VP or with content producers for live shows.

What you need to get started:

- **Designer software** - Bring ACES content straight into your Designer project, or take advantage of expanded support through ACES for colour standards.

- **disguise server** - Choose from our existing range of servers depending on the scale and complexity of your project.

- **rx nodes** - Networked together, each rx node will render only a portion of the overall content. Discover our rx render engine hosting platform, engineered for scale-out rendering.

- **RenderStream** - The perfect infrastructure to enable the rx, RenderStream allows seamless integration of real-time content from third-party render engines from the disguise software.
Manage colour with disguise

Get started today!

→ Get your free Designer licence here

→ Book a demo to learn more here

About disguise

The disguise technology platform enables creative and technical professionals to imagine, create and deliver spectacular live visual experiences at the highest level.

Combining real-time 3D visualisation-based software with high performance hardware, disguise delivers challenging creative projects at scale and with confidence. Its new award-winning Extended Reality (xR) workflow is empowering users to bring to life immersive visual experiences that inspire and engage remote audiences everywhere.