



# ACES Project Checklist

## Visual Effects Supervisors / Artists

This checklist is intended to help you organize your first couple of ACES projects, after which this should be second nature for you. Many of these steps you already do, so the emphasis here is to identify any ACES-specific questions you need to ask up front, and to suggest ways to get the answers.

### Getting Started

- As ever, communication is key. While ACES simplifies and standardizes the processes and settings, there are still some decisions to be made. By liaising with those who will be processing or viewing the image at various stages, and thoroughly testing your pipelines, a consistent result can be assured. This is the primary issue that ACES aims to solve — a consistent-looking image at every step, and for every collaborator.

### File Formats

- Discuss who is doing the VFX pulls, and the format to be used. This may be EXR files in either ACES2065-1 encoding or in the native color space of the camera, or log DPX files. If using DPX, the traditional 10-bit version should be avoided, as this is not sufficient to contain all the information captured by modern digital cameras.
- The ACES standard for interchange is 16-bit uncompressed EXRs in ACES2065-1 color space, with the **ACES Image Container** flag set (defined by SMPTE standard ST 2065-4). While it is not uncommon for facilities to use ACEScsg for internal interchange, this is non-standard, and care should be taken to ensure that ACEScsg files are not accidentally interpreted as ACES2065-1. The ACES Image Container flag should never be set for ACEScsg files, and ACEScsg should not be used for any external interchange.

### Working with DI

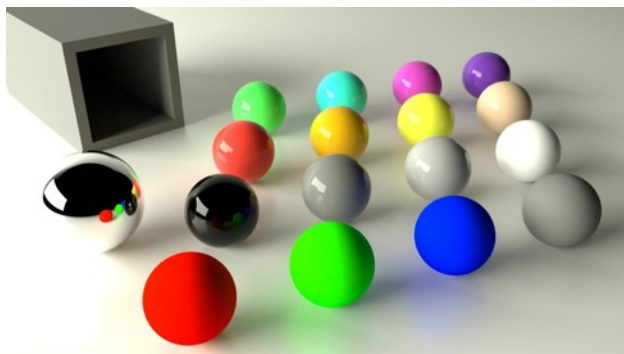
- Test a round-trip back to DI and editorial, to ensure that any pixels not modified by VFX are unaffected by the process, and exactly match those in the original plate for DI, and rendered color for editorial. Make sure that any plate normalization grades provided are invertible, so that they can be removed in final renders. Simple ASC CDL type transforms lend themselves best to communicating on-set looks to VFX and DI.
- Communicate with the colorist / DIT / dailies colorist, or whoever is providing the LUTs or grades, to ensure you apply them in the intended color space. This may be ACEScsc or ACEScct, or possibly linear ACES2065-1 for CLF (Common LUT Format) looks or [Look Transforms](#) (sometimes called Look Modification Transforms or LMTs). The same adjustment applied in ACEScsc and ACEScct will look identical in the mid-tones and highlights, so an incorrect working space may not be immediately noticed, but the shadow handling will be different. A correct working space is essential so that work-in-progress renders drop seamlessly into editorial.
- Decide whether you are using LUTs which have the Output Transform (sometimes called Output Device Transform or ODT) baked in or grade only LUTs. A fully baked LUT may be simpler, but it eliminates the ability to switch Output Transforms to preview on a different type of display. These LUTs will also eliminate the option to toggle the grade on and off, to see just the base ACES look.

## Compositing

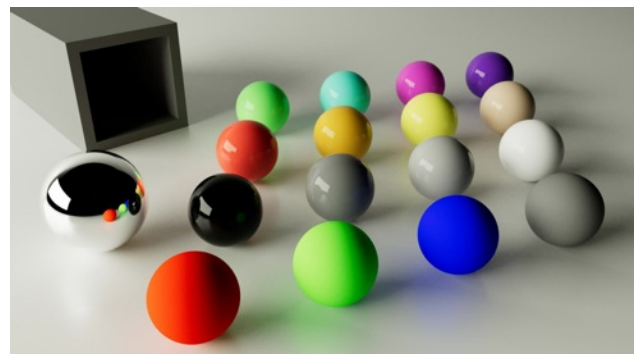
- Make sure you have access to all custom Input Transforms (sometimes called Input Device Transforms or IDTs) for cameras used on the show, and make sure you have them in a form that can be used in your compositing software.
- If you are using software such as Nuke, a move to ACES will not have a significant impact on the way you work. Nuke was designed from the ground up to work with linear image data – the same as ACES. However Nuke’s legacy color management does not specify a working color space, and it simply linearizes the image data with its current primaries, and uses 1D display transforms with no tone-mapping for values above 1.0. Recent versions use Open Color IO ([OCIO](#)) for color management. OCIO has options to mimic Nuke’s legacy approach, but also includes a pre-built [configuration for ACES](#).
- Software such as After Effects is geared towards working in a display-referred way, where the actual pixel values sent to the screen are manipulated. Display device color management is provided via ICC profiles which compensate for the difference between a standard and the actual display in use, although many people disable this feature. Moving to ACES will therefore involve a slight change of mindset, working on scene-referred image data, and viewing the result through an ACES Output Transform. This can be implemented in After Effects using the [free OCIO plugin](#) from Fnordware. Besides the standardization of input and output transforms that ACES brings, there are many other noticeable benefits to moving to scene linear, such as more realistic focus and exposure changes, without the need for 'cheats'.

## CGI

- Some 3D software (e.g. Cinema 4D) works internally in a high dynamic range linear way, but the software’s viewport treats this image data as display linear, offering only simple 1D view transforms that clip values greater than 1.0. The software may provide a highlight compression slider, but it is likely to use an unspecified algorithm that does not match the tone mapping of ACES. This means that rendering to an EXR (which generally requires a **linear sRGB** IDT in comp or DI) will result in an ACES image that does not match what was seen in the viewport. This difference must be accounted for when lighting and texturing, and the tendency to alter the scene to make it 'look right' through the viewport’s simple sRGB view transform should be avoided. The need to use LUTs or ICC profiles to preview the ACES look is discussed in [this thread](#) on ACES Central.



*Simple sRGB Viewer LUT*



*ACES sRGB Output Transform*

- HDRI environment captures should easily drop into an ACES pipeline, as they are already high dynamic range scene referred data. The only consideration is whether the primaries need to be mapped to ACEScg (AP1) primaries, to match the rendering color space. Texture libraries or your own SDR texture captures will also need to be converted to ACEScg. In this case a simple inverse sRGB transform plus a matrix should be sufficient, as textures should not contain image data above diffuse white.

## Software

- Make sure all the tools you are using are ACES compatible (ACES logo'd products are proven to be). Some non-Logo'd tools, such as Photoshop may be necessary for texture and matte painting. A version of the After Effects OCIO plugin is [available for Photoshop](#), should you need it. Alternatively you may have to use methods such as baking in an invertible ODT before working on the image. One method of doing so is discussed in [this thread](#) on ACES Central.
- Choose the [most current version of ACES](#) as long as it is implemented in every application in the pipeline and ensure all parties use the same version.

## Output Transforms

- Consider the calibration of artists' monitors when choosing the Output Transform. Are they calibrated to sRGB or P3 gamut? HDR monitors for artists are not yet common or practical, but a benefit of ACES is that artists can work on an sRGB monitor with an sRGB Output Transform (pushing and pulling the exposure to check that the comp doesn't 'break') and then render out a version with an HDR Output Transform for viewing in an HDR screening environment.
- Some Output Transforms come in 'D60 sim' versions that simulate the appearance of D60 white on a monitor calibrated to a different white point. Discuss with the colorist whether to use one of these, based on the intended final deliverable. If delivering for cinema, the DCDM Output Transforms map equal ACES values to D60, so a D60 sim Output Transforms is appropriate for preview.

## Spreading the Word

- Help educate team-members who don't know about ACES. The [ACES Primer](#) is a great place to start, as is the [ACES Overview](#) which accompanies this document. And [ACESCentral.com](#) has the latest information on ACES benefits and workflows.
- Take a look at the [workflow diagram](#) which shows how ACES overlaid onto the various components of a modern scene referred workflow.
- It may be helpful to study some of the other Quick Start Guides in this series, so that you are clear on how others will be working with the images and metadata you create. You don't need to be able to do everybody else's job, but understanding what their jobs entail will help you do yours better.

*If you have additions to this list that you think would be helpful, please contact us at [aces@oscars.org](mailto:aces@oscars.org)*

*Also, please share your ACES experience, tips and tricks for others on ACESCentral.*