Colour Management for Digital Photography

Guide 1: Camera Settings & Colour Profiles

Why Camera Colour Management Matters

Colour management is the system that ensures colour stays consistent and predictable as your image travels from camera sensor through editing software and on to screen or print. Getting it right at the capture stage gives you the best possible foundation — and avoids unpleasant surprises later.
This guide covers the decisions you make at the camera: colour space assignment, Picture Styles/Profiles, white balance, and how your RAW file captures colour data in the first place.

1. How Your Camera Records Colour

RAW vs JPEG — a fundamental difference

When you shoot **JPEG,** the camera processes the sensor data internally: it applies your chosen colour space, Picture Style/Profile, white balance, sharpening, and contrast, then compresses the result. Colour decisions are baked in.

When you shoot **RAW,** the camera records the raw sensor data with minimal processing. The colour space setting in the camera menu is largely irrelevant — it only affects the embedded JPEG preview you see on the LCD. The actual RAW data is colour-space-agnostic; you assign a working colour space when you open the file in Lightroom Classic or Adobe Camera Raw (ACR).

Practical takeaway: If you shoot RAW, the most important in-camera colour settings are white balance (which can still influence your starting point in Lightroom) and the camera's colour profile (which affects how the RAW developer interprets the sensor data). The colour space menu setting matters mainly for JPEG shooters.

2. Colour Spaces — sRGB, Adobe RGB, and ProPhoto RGB

A colour space is a defined range (gamut) of colours that can be represented within a given system.

sRGB
- The smallest of the three common spaces
- Designed for screen display and web use
- Covers roughly 35% of visible colour
- Standard for most consumer devices, social media platforms, and web browsers
- **Best for:** JPEG shooters whose images are primarily for web, social, or casual printing

Adobe RGB (1998)

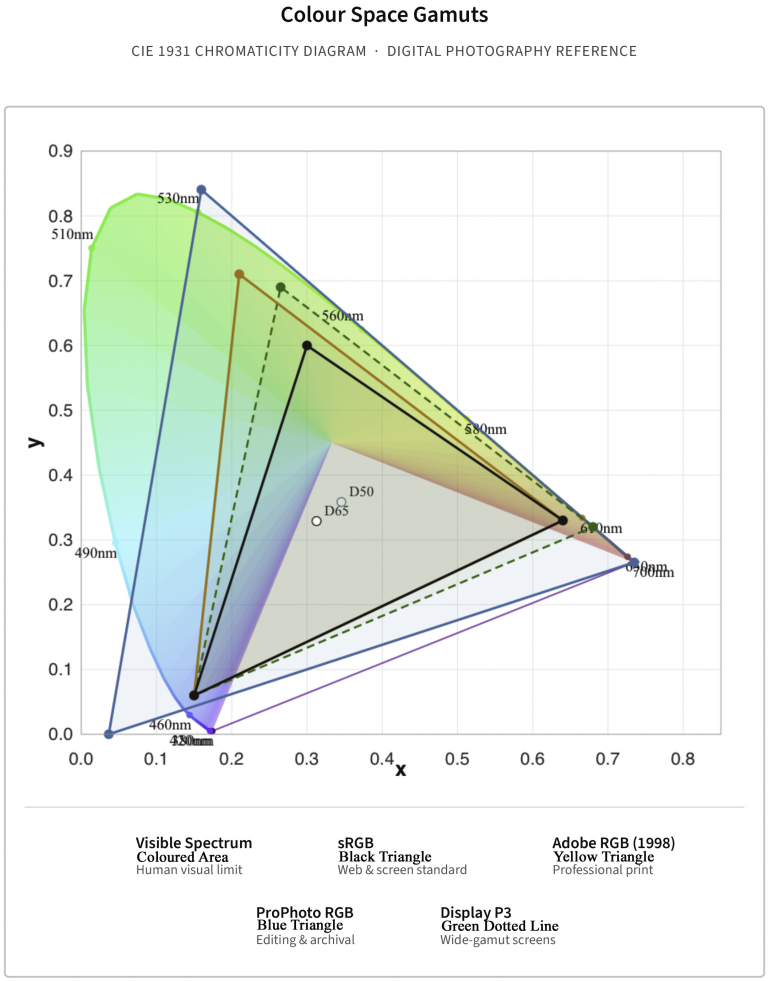
- Significantly wider than sRGB, particularly in the cyan-green range
- Covers roughly 50% of visible colour
- Supported by colour-managed print workflows and many professional labs
- Displays dull/desaturated on non-colour-managed screens if the profile is ignored
- **Best for:** JPEG shooters preparing files for professional printing or print labs that support it

ProPhoto RGB

- Extremely wide gamut — wider than what most printers or displays can reproduce
- Lightroom Classic uses a ProPhoto-based internal working space at16-bit.
- Retains maximum colour data during editing
- Not suitable as a delivery format — always convert to a smaller space for output
- **Best for:** The internal editing space in Lightroom/ACR; not a camera menu option.

In-camera recommendation

- **RAW shooters:** Leave the camera set to sRGB — it only affects the LCD preview. The choice that matters is made in Lightroom.
- **JPEG shooters for print:** Set Adobe RGB in-camera. Deliver as sRGB for web; convert to Adobe RGB when sending to a print lab that accepts it.
- **JPEG shooters for web/social only:** sRGB is simpler and safer.



sRGB

Universal standard for web, social media and consumer devices. Safe for all screens and platforms.

~35% OF VISIBLE SPECTRUM · 1996

Adobe RGB

Wider gamut than sRGB, especially in cyan-greens. Used in professional print workflows and colour-managed labs.

~50% OF VISIBLE SPECTRUM · 1998

ProPhoto RGB

Extremely wide gamut. Lightroom's internal editing space. Never use as a delivery format — always convert for output.

~90% OF VISIBLE SPECTRUM · KODAK

Display P3

Used in modern Apple displays and iPhones. Wider than sRGB in reds and greens. Growing standard for wide-gamut screens.

~45% OF VISIBLE SPECTRUM · DCI/APPLE

3. Camera Colour Profiles (Picture Styles / Creative Styles / Film Simulations)

Camera manufacturers give their colour profiles various names:

Manufacturer	Name
Canon	Picture Style
Nikon	Picture Control
Sony	Picture Profile
Fujifilm	Film Simulation
Panasonic	Photo Style

What they do
These profiles control how colour, contrast, saturation, and sharpness are rendered by the camera's internal processor. For JPEG shooters, they define the final look of your image. For RAW shooters, they influence two things:

1. **The embedded preview** (the JPEG thumbnail seen on the LCD and in your file browser)
2. The starting interpretation in your RAW processor — Lightroom Classic and ACR use Adobe's own Camera Matching profiles to replicate these looks

Common profiles and their characteristics

Standard / Auto The camera's default balanced rendering. Moderate contrast and saturation. Good all-rounder for general photography.

Neutral / Flat Low contrast and saturation. Preserves maximum tonal range. Ideal for RAW shooters who want a flat starting point for heavy editing. Also useful for video.

Portrait Optimised skin tones, slightly lower sharpness. Reds and yellows are pulledtoward warmer tones. Good starting point for portraiture when shooting JPEG.

Landscape Boosted greens and blues, increased sharpness. Makes foliage and skies pop. Can push saturation into territory that's hard to recover.

Vivid / Landscape Strong saturation and contrast across the board. Eye-catching but can clip colour in highly saturated scenes.

Monochrome Converts to black and white in-camera. RAW files still contain full colour data — you can ignore this profile in Lightroom and recover full colour. Useful for previewing a B&W conversion on the LCD.

Camera Matching Profiles in Lightroom Classic

When you open a RAW file in Lightroom Classic, look in the **Develop module > Camera Calibration panel** (or the **Profile Browser** at the top of the Basic panel). You'll see profiles named:

- Adobe Color (Lightroom's default, neutral and well-balanced)
- Adobe Standard
- Camera Standard
- Camera Portrait
- Camera Landscape
- Camera Neutral
- Camera Faithful
- Camera Vivid

The **Camera [Name]** profiles are Adobe's attempt to replicate your camera manufacturer's picture styles. If you shoot with Neutral in-camera, selecting **Camera Neutral** in Lightroom gives you a matching starting point.

Recommended workflow: Set your camera to **Neutral** or **Faithful** for RAW capture. In Lightroom, use **Adobe Color** (Lightroom's excellent default) or choose a Camera Matching profile if you want to start from a look that matches what you saw on your LCD.

4. White Balance

What it does

White balance tells the camera (or RAW processor) what "white" looks like under the current light source, so that whites reproduce as neutral and skin tones look natural. It's measured in Kelvin (K):

Light source	Approximate Kelvin
Candle / tungsten	2,500–3,200K
Early morning / late afternoon sun	3,500–4,500K
Midday daylight	5,200–5,500K
Overcast sky	6,000–7,500K
Open shade	7,000–8,000K
Flash	5,500–6,500K

Auto White Balance (AWB)

Modern cameras handle AWB well in consistent lighting. The limitation is that AWB can shift between shots in a sequence, making consistency harder in post-production — particularly for portraits or product shots where consistency across a set matters.

Preset White Balance

Using a daylight, cloudy, or flash preset gives you consistent, repeatable results within a shoot. This is preferable to AWB when you're shooting a series that needs to match.

Custom / Kelvin White Balance
For critical colour accuracy — particularly with studio flash or a controlled environment — set a custom white balance using a grey card or ExpoDisc, or dial in a specific Kelvin value. This is the most consistent approach. Low energy light bulbs sometimes the Kelvin value on the box.

White balance and RAW files
With RAW, white balance is not destructive — it's a metadata instruction to the RAW processor. You can change it freely in Lightroom without any quality loss. However, getting it approximately right in-camera speeds up your workflow and ensures the LCD preview is a trustworthy guide.

Practical tip: For portrait or studio work, shoot a frame with an 18% grey card or X-Rite ColorChecker Passport under your lighting. In Lightroom, use the White Balance Selector (eyedropper) on the neutral grey patch to set a precise custom white balance. You can then sync this across all images from that lighting setup.

5. The X-Rite ColorChecker Passport

If colour accuracy is important to your work — particularly portraiture, product photography, or any scene where skin tones or critical colours must be reproduced accurately — the **X-Rite ColorChecker Passport** (or **ColorChecker Classic**) is a worthwhile investment.

How it works
1.Photograph the ColorChecker under your shoot lighting at the start of a session.

2. In Lightroom Classic, use the **X-Rite plugin** (or Camera Raw's built-in ColorChecker support) to create a custom DNG camera profile from that target

3.Apply that profile to your images from that session

This creates a camera profile tuned specifically to your camera body and the lighting conditions of that shoot. It's the most accurate starting point you can give yourself.

6. Summary — In-Camera Colour Management Checklist

RAW shooters
- Colour space: sRGB (preview only — doesn't affect RAW data)
- Picture Style: Neutral or Faithful (flat, preserves tonal range)
- White balance: Use a preset or custom WB rather than AWB for consistency
- Consider a grey card or ColorChecker for critical colour accuracy

JPEG shooters (web/social)
- Colour space: sRGB
- Picture Style: Standard or Portrait (depending on subject)
- White balance: As accurate as possible — harder to correct post-capture
- Keep saturation and contrast moderate — difficult to recover clipped colour

JPEG shooters (professional print)
- Colour space: Adobe RGB
- Picture Style: Portrait or Neutral depending on subject
- White balance: Custom or preset — consistent across a shoot
- Deliver as sRGB for web; keep Adobe RGB for print lab submission