

Deeper Calibration — The Measurement Data

The validated results behind the accuracy claims

Deeper Calibration was tested **back-to-back on the same 24 displays** – each calibrated once with Faster (**Standard**) and once with **Deeper Calibration**, then independently re-measured. This is a true same-hardware comparison, not an estimate. The displays spanned **Windows and macOS** and **every major panel technology** – OLED, mini-LED, XDR, and LED-LCD – measured by three independent testers using the perceptual color-error standard, **ΔE_{00} (Delta E 2000)**.

The Results (*Standard Mode vs. Deeper Calibration Mode*)

Result	Finding
Average accuracy gain	30% or better gray-scale accuracy than Standard
Displays improved	24 of 24 (100%) – every display tested
Color deviation (Delta E)*	1.26 $\rightarrow$ 0.83 ΔE_{00}

At 1.26 ΔE_{00} , Standard already delivers professional-grade accuracy. Deeper moves the average to 0.83 - below 1.0, the point where a color difference generally stops being visible at all (see below for the ΔE_{00} classification range)*

What Improved

Deeper calibration's gains concentrate exactly where the eye notices them – in the neutrality of grays and whites:

- **Improved red-green tint.** The single biggest and most consistent win – the residual cast that subtly shifts grays toward magenta or green.
- **Improved white-point error.** Whites land closer to a neutral D65, the professional daylight target.
- **Improved blue-yellow tint.** Less warm/cool drift across the gray scale.
- **Tone reproduction is protected.** Lightness and gamma are verified and held to target and the 16-bit correction produces smoother tonal transitions.

Display	Panel	Improvement
Dell P2715Q	LED-LCD	53.70%
Lenovo P53 (built-in)	LED-LCD	43.70%
Dell U2717D	LED-LCD	37.10%
LG 38WK95C	LED-LCD	31.40%
Apple Studio Display	LED-LCD	27.50%
Dell Latitude 9420 (laptop)	LED-LCD	26.30%
Dell P2415Q	LED-LCD	22.70%
Small Dell laptop (built-in)	LED-LCD	17.50%
Acer XB323U (gaming)	LED-LCD	15.80%
Apple MacBook Pro M4	LED-LCD	13.70%
BenQ EX2780QT (gaming)	LED-LCD	6.60%
MacBook Pro M1 13"	LED-LCD	4.90%
Dell G2723H	LED-LCD (IPS)	40.90%
ASUS PA279	LED-LCD (IPS)	34.00%
Acer X275U	Mini-LED	53.10%
ASUS PA32UCX	Mini-LED	44.40%
Apple Pro Display XDR	Mini-LED XDR	30.90%
Apple 14" (built-in)	Mini-LED XDR	16.90%
ASUS PA32DCX	OLED	57.50%
YMK EM160 (portable)	OLED	47.30%
Large Dell laptop (built-in)	OLED	39.50%
LHC E15K1F (portable)	OLED	34.90%
Samsung Odyssey G61SD	OLED	33.60%
MSI MEG 342C	OLED	31.90%
Average		30%

What the Numbers Mean for Your Work

A color cast in the grays tints everything built on top of it – skin tones, shadows, gradients, and black-and-white work. By neutralizing that cast across the full gray ramp and re-anchoring the white point, Deeper Calibration gives you:

- **Neutral whites and grays** – a more trustworthy editing reference.

- **Cleaner shadows** – less hidden tint in the darkest detail.
- **Greater screen-to-screen and screen-to-print confidence** – when displays sit below the visible-error threshold, the differences you can't measure are also the ones you can't see.

Technical Terms

* What is Delta E 2000?

Delta E 2000 (ΔE_{00}) is the CIE standard for measuring how different two colors appear to the human eye ([ISO/CIE 11664-6](#)). It weighs lightness, chroma, and hue the way people actually perceive them, so the number tracks what you can see. A lower ΔE_{00} means the displayed color is closer to the intended target.

For customers, it answers a simple question: **how accurately does this display reproduce color?**

A Delta E value below 2 is widely regarded as the benchmark for professional color accuracy, while values below 1 indicate color differences that are typically indistinguishable to human observers.

Classification:

- **$\Delta E < 1$:** Extremely accurate. Differences are generally not visible in normal viewing. This is the level color-critical work aims for.
- **$\Delta E 1 - 2$:** Very accurate. Differences are barely perceptible and typically only noticeable during direct comparison. Most common acceptance range for photo & video work.
- **$\Delta E 2 - 3$:** Good accuracy. Differences may be visible on close comparison. Acceptable for most creative work.
- **$\Delta E 3 - 5$:** Differences are visible without direct comparison, though still acceptable for general viewing.
- **$\Delta E > 5$:** Color inaccuracies are clearly noticeable and may affect the viewing experience, not suitable for color-critical work.

Red Green Tint Improvement

Improvements along the red-green axis are particularly important because the human visual system is highly sensitive to red-green color differences. Even small inaccuracies can noticeably affect the appearance of skin tones, foliage, and other natural colors, making precise calibration in this color range critical for realistic and accurate color reproduction.

For **display calibration**, this means that even if overall Delta E values are low, improving accuracy on the red-green axis can produce a disproportionately large improvement in perceived image

quality. Skin tones appear more natural, greens look less artificial, and color transitions become more realistic.

Blue Yellow Tint

The blue-yellow axis describes color variations between cool (blue) and warm (yellow) tones. Deviations along this axis can introduce visible color casts in neutral grays and whites, affecting white balance and the overall natural appearance of an image. Reducing blue-yellow errors helps ensure accurate color temperature and a more realistic viewing experience.

White Point Error

A White Point Error is the difference between a display's measured white color and its intended target white point.

In display calibration, "white" is not simply the brightest white possible. It is defined by a specific color temperature and chromaticity, most commonly D65 (6500 K) for sRGB, Rec.709, and most modern displays.