

# Measurement Report - Verification of Profile - CP1500-576p-ChromIQ-NCM-verify

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**Report type:** Validation print check (ISO 12647-8) · **Judged against:** Custom ISO 12647-7

This report judges the profile built in CP1500-576p-ChromIQ-NCM, run 1. It was verified by printing a chart through that profile, measuring it, and comparing the measurements with the chart's own aim values. The measurements it covers are listed under Report Scope.

## Report Scope

The following verification run is included:

- CP1500-576p-ChromIQ-NCM-verify, Instrument: X-Rite i1 Pro 3 · Measurements: 1

**No. of Measurements:**

1

**Date range:**

2026-10-18 – 2026-10-18

## How to read this report

This report compares what the instrument measured against the chart's design colours (the reference values the chart was built from). Most numbers are colour differences in  $\Delta E_{00}$ : 0 is a perfect match, 1–2 is barely visible, and 10 or more is clearly different. The others name their own unit:  $\Delta Ch$  for a colour cast,  $\Delta L^*$  for a lightness difference,  $L^*$  for a lightness.

- $\Delta E_{00}$ , paper white against the reference paper: How far the bare paper of the printed test chart sits from the paper the reference describes. A paper that is bluer, warmer or darker than the aim moves every colour printed on it.
- Maximum  $\Delta E_{00}$ , solid colours: The worst of the four solid ink corners against what they should be. Solids are where an ink is laid down at full strength, so they show the ink itself rather than the profile.
- Maximum  $\Delta H^*ab$ , cyan, magenta and yellow solids: Whether the three chromatic solids shifted in hue, ignoring how light or how saturated they are. A hue shift in a solid is the one error the eye finds hardest to forgive.
- Average  $\Delta E_{00}$ , control strip: The average colour error over the patches of the control strip on the test chart used: the run of patches a press or a proof is checked on.
- Maximum  $\Delta E_{00}$ , control strip: The worst single patch of that control strip.
- Maximum  $\Delta E_{00}$ , control strip, lowest 95 % (95th percentile): The error that 95 % of the declared strip stays under, so one bad patch does not decide the result.
- Average  $\Delta Ch$ , grey balance of the grey ramp: How neutral the greys of the printed test chart are on average: how far each step of the grey ramp sits from having no colour cast at all. Lightness is ignored, only the cast is counted.
- Maximum  $\Delta Ch$ , grey balance of the grey ramp: The worst single step of the grey ramp. One step with a cast is visible in a photograph even when the average looks healthy.
- Average  $\Delta E_{00}$ , all patches (within gamut): The average colour error over the whole chart. The headline number, and the one to watch over time.
- Average  $\Delta E_{00}$ , lowest 95 % (within gamut): The average over the lowest 95 % of the patches, with the highest 5 % left out, so a handful of very hard colours cannot hide an otherwise good result.
- Average  $\Delta E_{00}$ , highest 5 % (within gamut): How bad the hardest colours are: the average over the highest 5 % alone. This is the row that answers what happens at the edge of what the printer can do.
- Maximum  $\Delta E_{00}$ , all patches (within gamut): The single worst patch on the sheet. Useful for finding a misread or a damaged patch as well as a real error.
- Maximum  $\Delta E_{00}$ , lowest 95 % (95th percentile) (within gamut): The maximum difference within the lowest 95 %, which is the 95th percentile: the error 95 % of the chart stays under, counted by rank rather than by fitting a curve.
- Average  $\Delta E_{00}$ , outer-gamut patches: The average error over the most saturated quarter of the test chart used, the colours at the edge of what the printer can reach.
- Average  $\Delta E_{00}$ , surface-gamut patches: The average error over the patches that sit on the outside of the device cube, where a profile has least room.
- Maximum  $\Delta L^*$ , single-colour ramps 30 % to 70 %: Whether the mid-tones of each single ink, and of grey, land at the right lightness. This is the part of a ramp the eye reads as contrast.
- Maximum  $\Delta E_{00}$ , repeat patches on one sheet: How far apart the patches of one colour landed where that colour appears more than once on one sheet of the test chart used. No profile and no aim value is in this number: the patches were asked for the same thing, so what separates them is the printer and the instrument together.
- Maximum  $\Delta E_{00}$ , the same chart measured again: Whether the same file prints the same colour on another sheet and on another day. This is the question behind asking whether a printer is steady, and it is answered by measuring the same chart more than once.
- Maximum  $\Delta E_{00}$ , between two of the nine sheet areas (within gamut): Evenness checks whether the printed sheet shows the same colour everywhere. It has two metrics, "Maximum  $\Delta E_{00}$ , between two of the nine sheet areas" and "Maximum  $\Delta E_{00}$ , one sheet area against the whole sheet". This one is the largest difference between any two of the nine areas. A gradual change from one side of the sheet to the other shows here first, because the two far sides differ most. An uneven sheet usually has one of these causes: banding from the printer, a partly blocked or misaligned print head, paper that is not flat or not the same all over, or, on an instrument that reads whole strips, the instrument changing while it reads. The strips are read one after another, so such a change during the reading shows as a difference across the strips rather than down them. If a difference runs steadily from the first strip read to the last, measure the sheet again in the opposite order: a difference that turns round with the reading may come from the instrument.
- Maximum  $\Delta E_{00}$ , one sheet area against the whole sheet (within gamut): Evenness checks whether the printed sheet shows the same colour everywhere. It has two metrics, "Maximum  $\Delta E_{00}$ , between two of the nine sheet areas" and "Maximum  $\Delta E_{00}$ , one sheet area against the whole sheet". This one is the largest difference between one area and

the average of all nine. A single area that is off, a blotch, shows here first; a gradual change from one side to the other shows first in the row above. An uneven sheet usually has one of these causes: banding from the printer, a partly blocked or misaligned print head, paper that is not flat or not the same all over, or, on an instrument that reads whole strips, the instrument changing while it reads. The strips are read one after another, so such a change during the reading shows as a difference across the strips rather than down them. If a difference runs steadily from the first strip read to the last, measure the sheet again in the opposite order: a difference that turns round with the reading may come from the instrument.

**The four verdict words.** A limit set is one column of the limits table: the numbers a report is judged against. Every row of the results ends in one of four verdict words.

- **PASS:** the measured value is within the limit for that row.
- **FAIL:** the measured value is over the limit for that row.
- **INFO:** the number is shown for information only and nothing was judged from it. That happens when the sheet is a profiling measurement, which is never graded, and when the row needs something about the print that was not recorded; the note under the results names the rows in that last case.
- **N-A (not applicable):** the value could not be worked out from the measured chart. A raised number beside it points to the note under the results that names what is missing.

A column marked “printed raw” under “Judged against” is a sheet printed without the profile. Its paper and solid colour rows are judged against the profile where the limit set has a limit for them; its values that compare the print with the chart’s design colours read INFO, with a numbered note that says so. A column’s Overall word is PASS when every row that could be checked passed; a row the test chart used could not answer is not counted as a failure, and the sentence under the word says how many there were.

A column named after a standard is judged against its limit set’s limits, applied to the values measured on the printed test chart rather than to that standard’s own chart and control strip. Such a column reads PASS or FAIL like any other, and the note under the results says what that word does and does not mean.

What the numbers mean depends on how the chart was printed:

- A profiling chart is printed **WITHOUT** colour management (the raw print that is measured to build a profile). It is not expected to match the design closely, so the  $\Delta E$  can look large, and that is normal. Here it is the **CHANGE** between dated reports that matters, not a single value.
- A verification chart is printed **THROUGH** the finished profile, with the printer’s colour management off. It **SHOULD** match the design closely, so low  $\Delta E$  and passes mean the profile is still accurate; numbers rising over time mean that the profile describes the printer less well than it did. (Printed raw instead, the same sheet is a check of the printer itself, and the report says which way each sheet was printed.)

Some of a chart’s design colours can be brighter or more saturated than this printer and paper can physically produce; no profile can print them, however good it is. Where a sheet was compared with its profile’s gamut, the colour-accuracy figures are split into two groups: “Within the profile’s gamut”, the colours that were genuinely printable, the fair measure of accuracy, and “Beyond it”, the unreachable ones, whose distance describes the limit of the gamut, not a mistake of the profile. Every patch stays counted and visible.

Where a sheet is split this way, the verdict words of the colour-accuracy and evenness rows judge the within-gamut figures.

The  $\Delta E$  figures measure a whole chain in one number: the profile’s conversion of each colour to printer values, the printer’s behaviour on the day, and the instrument’s own small uncertainty. A rising number means something in that chain has moved; by itself it does not say which part.

These figures show how one profile holds up over time. They are not a fair measure for ranking papers or printers against each other: where a sheet is split by the profile’s gamut, the averages cover only the colours each profile can print, and that set differs with every paper. A glossy paper keeps more of the difficult, saturated colours than a matte one, so its average can look worse while it is printing better.

Because the design reference never changes, comparing dated reports of the same chart on the same printer is a clean, reliable signal of change: ageing inks, a wandering printer, or an instrument going off. Screen and print colours here are approximate; the numbers come from the measurement file and are exact.

## Report Results

The following results are extracted from detailed data for the included measurements in this report. Where a sheet's colours are split into within / beyond the profile's gamut, the words judge the within-gamut figures; colours the profile could never print are not counted against it.

| Metric                                                                          | 2026-10-18         |
|---------------------------------------------------------------------------------|--------------------|
| $\Delta E_{00}$ , paper white against the reference paper                       | PASS <sup>1)</sup> |
| Maximum $\Delta E_{00}$ , solid colours                                         | N-A <sup>2)</sup>  |
| Maximum $\Delta H^*_{ab}$ , cyan, magenta and yellow solids                     | N-A <sup>2)</sup>  |
| Average $\Delta E_{00}$ , control strip                                         | FAIL               |
| Maximum $\Delta E_{00}$ , control strip                                         | FAIL               |
| Maximum $\Delta E_{00}$ , control strip, lowest 95 % (95th percentile)          | FAIL               |
| Average $\Delta Ch$ , grey balance of the grey ramp                             | FAIL               |
| Maximum $\Delta Ch$ , grey balance of the grey ramp                             | FAIL               |
| Average $\Delta E_{00}$ , all patches (within gamut)                            | PASS               |
| Average $\Delta E_{00}$ , lowest 95 % (within gamut)                            | PASS               |
| Average $\Delta E_{00}$ , highest 5 % (within gamut)                            | FAIL               |
| Maximum $\Delta E_{00}$ , all patches (within gamut)                            | FAIL               |
| Maximum $\Delta E_{00}$ , lowest 95 % (95th percentile) (within gamut)          | PASS               |
| Average $\Delta E_{00}$ , outer-gamut patches                                   | FAIL               |
| Average $\Delta E_{00}$ , surface-gamut patches                                 | FAIL               |
| Maximum $\Delta L^*$ , single-colour ramps 30 % to 70 %                         | PASS               |
| Maximum $\Delta E_{00}$ , repeat patches on one sheet                           | N-A <sup>3)</sup>  |
| Maximum $\Delta E_{00}$ , the same chart measured again                         | N-A <sup>4)</sup>  |
| Maximum $\Delta E_{00}$ , between two of the nine sheet areas (within gamut)    | N-A <sup>5)</sup>  |
| Maximum $\Delta E_{00}$ , one sheet area against the whole sheet (within gamut) | N-A <sup>5)</sup>  |
| Overall                                                                         | FAIL               |
| Judged against                                                                  | Custom ISO 12647-7 |

This limit set is named after a standard. Its limits were applied to the values measured on the printed test chart with ChromIQ's own metrics, not to that standard's own chart and control strip with its own methods, so this is not a test against that standard. A PASS means that the measured values are inside these limits. It is not proof that the print meets the standard, and where these limits are wider than the standard's own it says nothing about the standard.

**Notes on the verdicts above:**

- 1)  $\Delta E_{00}$ , paper white against the reference paper: In this measurement the paper is compared with the paper white recorded in the profile (the one the chart was printed through, or else the profile of its run), which is the paper that profile was made for. The cube-corner table compares the same patch with the chart's own aim for white, an ideal white, so the two can differ.
- 2) Maximum  $\Delta E_{00}$ , solid colours; Maximum  $\Delta H^*ab$ , cyan, magenta and yellow solids: the measured chart was printed through the profile, so its cyan, magenta, yellow and black patches were converted to other ink amounts before printing and are not the printer's own solids
- 3) Maximum  $\Delta E_{00}$ , repeat patches on one sheet: the measured chart never asks for the same colour twice, so there is nothing on the sheet to compare with itself
- 4) Maximum  $\Delta E_{00}$ , the same chart measured again: this is the first measurement of the measured chart, so there is nothing to compare it with
- 5) Maximum  $\Delta E_{00}$ , between two of the nine sheet areas (within gamut); Maximum  $\Delta E_{00}$ , one sheet area against the whole sheet (within gamut): the measured chart has 8 strips and 12 rows on its largest page; at least 9 strips and 9 rows are needed on a page

A row that could not be worked out says nothing about the printer and is not counted as a failure; each note above says why.