Quad Proof Report - User Guide

This Guide was designed to explain the components of the Quad Proof Report so the recipient understands how the report was generated, what the data and graphs illustrate, and how to interpret the feedback in order to understand the compliance of the measured color proofs to standard reference data.

The Quad Proof Report provides very useful feedback based on the analysis of measurements taken directly from the supplied proof. Given the number of variables that go into creating a digital color proof, it is nearly impossible to determine the root causes that contribute to areas reported to be out of compliance from only the report data. However, this Guide provides a troubleshooting paragraph for each component to give general direction for problem areas, which can assist a proofing technician or product vendor in determining how best to remedy a situation.

The colorimetric tolerances were determined at Quad, and are closely related to SWOP, Idealliance, & ISO Certification tolerances. Quad has elected to use DeltaE 2000 to relate more to appearance based color differences relating to the human eye.

GENERAL SUMMARY

COMPLIANCE

A relative designation of Good, Fair, or Poor is used to indicate compliance to the selected reference data.
A "Good" is a very tight compliance to the reference data. A "Fair" is a passing compliance to the reference data, but may identify some area of concern. A "Poor" means that one or more patches are out of the reference data tolerances. This designation is only used as a gauge for comparing progress when attempting to improve results, or to compare several proofing systems.

REPORT DETAILS

General information about the customer, prep supplier, the proof samples that were submitted and measured, what data the measurements were compared against, and how the samples were measured.

FULL GRAY BALANCE ANALYSIS

Status indication of Good, Fair, or Poor, comparing measurements from the sample P2P patches to the listed reference data. Conditions of Average and Maximum deltaE (2000) are listed, using tolerances of 2.0 for Average, and 3.0 for Maximum of any single patch. A status of Fair or Poor will also list Comments warning of the implications of attempting to print to these proofs if the condition is left uncorrected.

FULL COLORIMETRIC ANALYSIS

Status indication of Good, Fair, or Poor, comparing measurements from the sample IT8.7/4 patches to the listed reference data. If the difference between the characterization data set and the IT8/7.4 target is an average delta E (2000) <1.5 for all patches and a maximum delta E <6.0 for at least 95% of all patches, and the primary solid patches, cyan, magenta, yellow, red green and blue on the IT8/7.4 are delta E <5.0 from the characterization data set, The measurement is in tolerance to the targeted data.
A status of Fair or Poor will also list Comments warning of the implications of attempting to print to these proofs if the condition is left uncorrected.

PAPER ANALYSIS

Status indication of Good, Fair, or Poor, comparing measurements from the sample IT8.7/4 paper patches to the listed reference data. Condition of deltaE(2000) is listed, using a tolerance of 1.5. A status of Fair or Poor will also list Comments warning of the implications of attempting to print to these proofs if the condition is left uncorrected. It is the responsibility of the proof provider, working closely with the client, to determine a good correlation of the proofing stock (or simulation) to that of the print stock.

COLORIMETRY

CMYK PRIMARY PATCH DELTA E

What is it? A report of single-color primaries (CMYK), two-color overprints (RGB), a CMY overprint, and paper white, comparing the L*a*b* values of the measured sample to the reference data, expressed in deltaE(2000). Why is it important? It is indicative of the relationship of the pure components of color in a subtractive color system (CMYK) between proofing, and what it should represent - the press.

Pure color components represent the achievable color gamut, in which the proof should not exceed that of the press (or reference data). Troubleshooting: Out of tolerance deltaE values in this area may indicate core problems with the proofing inks and/or gamut-size differences between proof and press, illustrating unachievable color matching. Error contribution can also be attributed to paper white deltaE, and/or limiting of ink density, which have an impact on gamut size.

CMYK Primary Patch Delta E

	L*a*b* Reference			L*a*b* Comparison			
Primary	L*	a*	b*	L*	a*	b*	dE2000
Paperwhite	90.05	-0.01	4.14	90.26	0.81	4.05	1.19
Black	19.00	1.01	1.18	18.85	1.46	0.93	0.69
Cyan	56.56	-37.98	-40.03	56.12	-36.13	-42.17	1.05
Magenta	47.64	69.97	-3.54	48.55	69.22	-1.60	1.22
Yellow	85.43	-5.62	84.62	86.15	-6.04	83.29	0.57
Red	47.43	64.38	42.74	47.89	64.55	44.38	0.84
Green	52.26	-61.49	26.76	52.13	-59.83	25.43	0.59
Blue	26.54	18.56	-42.01	25.99	19.26	-42.09	0.59
Overprint	24.73	0.21	-0.12	25.52	0.83	0.49	1.22

TOP 10 DELTA E PATCHES

What is it? A report of the ten-most out of tolerance patches, expressed in deltaE(2000), comparing the measured IT8.7/4 sample to the reference data.
Why is it important? Illustrations of the color values, and the degree that they are out of tolerance, may be cause for concern, and could also be indicators of the symptoms of a problem.

Troubleshooting: The color values shown in this area indicate where to focus troubleshooting (e.g. light tones skewed by high paper white deltaE, dark tones affected by ink hues or ink limiting).

Top 10 Delta E Patches

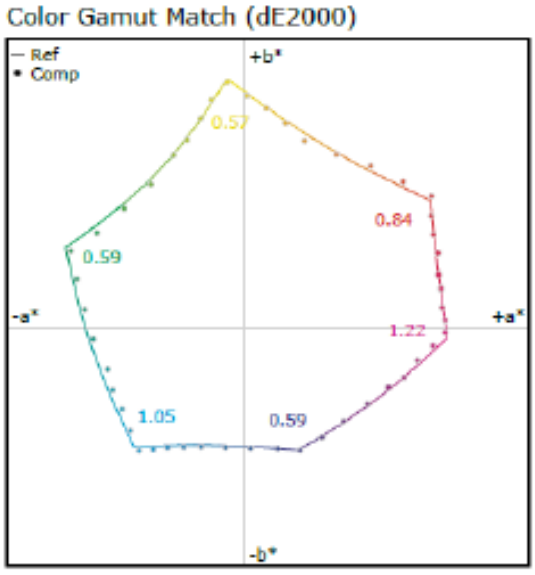
				L*a*b* Reference			L*a*b* Comparison			
C	M	Y	K	L*	a*	b*	L*	a*	b*	dE2000
40	0	0	100	16.25	-2.69	-3.77	17.98	-3.44	-6.63	2.65
40	100	0	100	9.20	11.70	-3.95	9.42	9.31	-3.12	2.11
100	100	0	100	7.91	7.18	-7.44	11.14	7.13	-8.01	2.06
40	40	0	100	12.79	3.64	-3.94	12.44	5.32	-4.32	1.95
100	100	40	100	8.38	3.44	-3.13	10.91	4.19	-2.92	1.84
0	0	0	85	31.07	0.35	1.01	30.65	1.58	1.21	1.78
100	40	0	0	44.23	-17.41	-40.21	43.10	-14.86	-40.90	1.76
40	0	100	100	15.27	-6.52	8.53	15.72	-6.84	11.04	1.75
5	0	0	0	88.00	-1.85	1.38	88.20	-0.60	1.48	1.74
3	0	0	0	88.82	-1.12	2.47	88.93	0.07	2.72	1.74

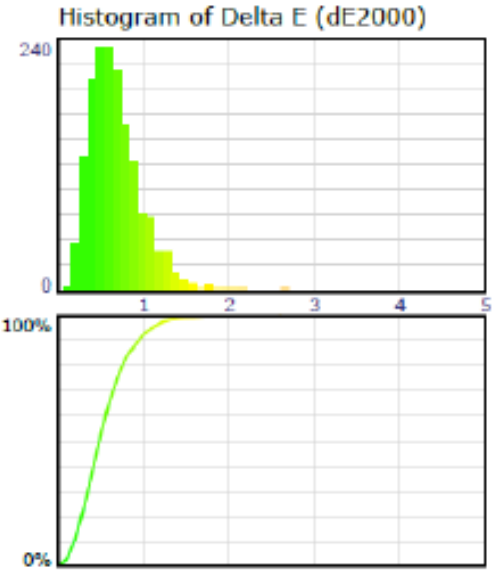
COLOR GAMUT MATCH (DE2000)

What is it? A graphic illustration of all single-color and two-color outer gamut values from the IT8.7/4 measurements of the sample (shown as dots), compared to the reference data gamut area (shown as a line). The gamut shape represents the maximum color saturation of the system. Six primary colors (CMYRGB) also list their respective deltaE(2000) values.
Why is it important? It is indicative of the relationship of the pure components of color in a subtractive color system (CMYK) between proofing, and what it should represent - the press. Pure color components represent the achievable color gamut, in which the proof should not exceed that of the press (or reference data). Troubleshooting: Out of tolerance deltaE values in this area may indicate core problems with the proofing inks and/or gamut-size differences between proof and press illustrating unachievable color matching. Error contribution can also be attributed to paper white deltaE, which has an impact on gamut size.

HISTOGRAM OF DELTA E (DE2000)

What is it? A graphic representation of the deltaE(2000) values per the population of the IT8.7/4 sample measurements compared to the reference data. The top graph shows the number of samples (vertical axis) graphed against their deltaE(2000) values (horizontal axis). The bottom graph shows the percentage of the population of patches per deltaE(2000). A narrow grouping (colored green) on the left side of the graphs indicates good compliance (low deltaE).
Why is it important? While Average and Maximum deltaE summaries are important measures on the Summary Page, the histogram information illustrates how variant the population is, in terms of deltaE(2000), and to what degree.
Troubleshooting: A graphic showing wide variation may indicate that there are several problems causing many degrees of errors among the population. A graphic showing narrow grouping at a high deltaE may indicate that there is a more isolated problem.



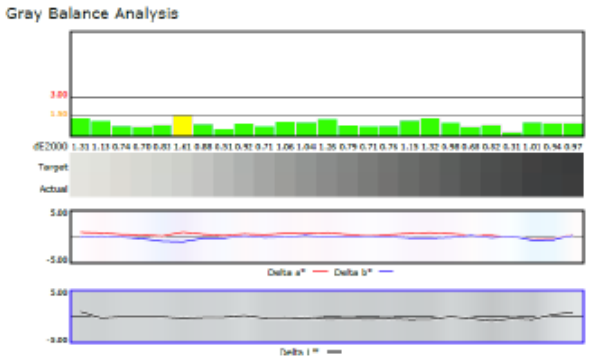


GRAY BALANCE / DENSITOMETRY

GRAY BALANCE ANALYSIS

What is it? A graphic representation of the colorimetric difference between the CMY gray values of the measured P2P sample, and the reference data. The graphics show deltaE(2000) bar graphs indicating compliance to the reference data and tolerances for the entire tonal range of CMY neutrals, gray scale images representing the measured sample to the reference values, and a line graph of delta a* and delta b* (hue differences, which are also expressed graphically as tints for reference only) for the entire tonal range of CMY gray.

Why is it important? Gray balance is a key attribute of calibration and color management, and is often indicative of problems. Gray balance is critical to color reproduction, and is very visually perceptible when judging color matching.
Troubleshooting: Gray balance problems may indicate overall global calibration issues. Refinements to calibration, linearization, tonal curves, or color management settings based on feedback from the bar graph (degree of problem) and the a*b* plot (direction of gray imbalance) may improve results.



DENSITOMETRIC ANALYSIS

What is it? A graphic representation of colorimetrically calculated Tone Value Increase differences between the pure-color CMYK scales in the measured P2P sample, and the same patches from the P2P reference data. A table summarizing these values for quartertone, midtone, and three-quartertone appears below the graph.
Why is it important?

This traditional approach to color calibration may be a more familiar means of adjustment to some people. The importance mirrors the explanation in Gray Balance Analysis.
Troubleshooting: Gray balance problems may indicate overall global calibration issues. Global adjustments to calibration, linearization, or color management settings based on TVI differences could improve compliance. Note: pure-color preservation settings in the color engine may yield non-parallel results to the Gray Balance Analysis.