The Interaction Between Color Standards and Production Tolerances: A Mismatch of Metrics

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Scope
• Profiling and verification
• Targets and specifications
• Analysis of potential issues
• Recommendations for practical implementation

Color management process
• Within North America many people will print to a G7 data set
  • Target one of the CRPC's
• Let's use the example of CRPC 6 – GRACoL 2013

Profiling 101
• Optimize / linearize press
  • Many people forget this step
• Print a profiling target
  • Native state of press
• Measure using instrument
• Create profile using software
• Utilize the generated profile

How do people check they are conforming?
• Use the TC1617
  • Or P2PS1 if targeted or grayscale
• Use the ISO 12647-7 control strip?
  • Two or three strip versions
• Look at the sheet
• Don't do anything!!

Targets and specifications
Does this cause an issue

- Two potential issues
  - Different measurement / validation criteria
    - Critical
  - Different measurement patches
    - Workable but can give issues if close to the pass

G7 Tolerances

- Targeted
  - $\Delta E_{00}$ paper
  - $\Delta E_{00}$ K
  - $\Delta E_{00}$ CMY
  - $\Delta E_{00}$ RGB

- Colorspace
  - $\Delta E_{00}$ avg all patches
  - $\Delta E_{00}$ 95% all patches

Typical targets for this

- Idealliance 12647-7 two and three row targets
- FOGRA validation wedge

But what happens if you use other targets?

- Why do people do this?
So we are using the three bar strip

- ISO 12467-7 Color Bar
  - \(\Delta E_{00}\) paper
  - \(\Delta E_{00}\) avg all patches
  - \(\Delta E_{00}\) max primaries (CMYK)
  - \(\Delta H\) max, CMY
  - \(\Delta Ch\) avg CMY Gray
  - \(\Delta Ch\) max CMY Gray

- ISO 12467-8 Validation Print Bar
  - \(\Delta E_{00}\) paper
  - \(\Delta E_{00}\) avg all patches
  - \(\Delta E_{00}\) max CMY/RGB patches
  - \(\Delta H\) max, CMY
  - \(\Delta Ch\) avg CMY Gray
  - \(\Delta Ch\) max CMY Gray

Other tolerance sets .......

- And to look at more
  - ISO 12647-7 Color Bar - uses \(\Delta E\)

- ISO 15311 PSD 2016 media relative
  - \(\Delta E_{00}\) avg all patches
  - \(\Delta E_{00}\) 95% all patches
  - \(\Delta Ch\) avg CMY Gray

- ISO 15311 PSD 2011 media relative
  - \(\Delta E_{00}\) avg all patches
  - \(\Delta E_{00}\) 95% all patches

Verification to G7 colorspace

- Typically people use a TC1617 chart
  - Full data
  - See what is happening

- Reality
  - People don't like to measure!
  - Use different charts
  - And metrics

So what happens?

The impact of the different tolerance sets - 12647-7
The impact of the different tolerance sets

12647-7 tolerances

So what about the P2P51 alongside - targeted

P2P51 reverse targets

12647-7 and P2P51 targets
Closing thoughts

- The use of the full TC1617 is not sustainable in many production environments
  - Using other targets and tolerance sets leads to inconsistencies, false positives and false negatives!
- A simplified target set needs to be universally agreed upon for verification to a CRPC
  - Essential the same tolerances be used for the reduced data set
  - Standard target would be preferable

Questions

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