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G7 Curve Creation

Conventional Presses

Presented by: David Hunter

G7 Curve Creation Agenda

Adjusting Printing Devices- into Alignment

- Defining what is “Normal Variation” by collecting print data
  - How does Printer manufacture color today, yesterday, last week
- Apply to your Production Standard, Expectations, May Define…
- Determine which printers need adjustment and how…
  - Printers that are farthest out of alignment get priority
- #1 Reason Curves don’t work: Printer not **Stabilized**
  - Conventional Printers- use multiple measurements over time
  - Digital Printers- can use one measurement

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2. Baseline Printing Devices

Collect Data to define what is “Normal” for printers

- Use E-Factor to quantify Precision and Accuracy!!!

Offset Press

GRACoL2013

Proofer

Large Format

Digital Press

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Apply Production Standard- Every Job/Day

Bullseye- Industry Reference Condition (GRACoL)

- How Close is Close Enough: Salable vs Waste

Offset Press

GRACoL2013

Proofer

EF =5

Large Format

Digital Press

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Learn What is Normal for Your Printers

Pass/Fail Criteria based on Salable/Acceptable Result

Offset Press

GRACoL2013

Proofer

EF =5

Large Format

Digital Press

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Collecting Data: Conventional Presses

Understand "Normal" Evolution… Collecting Data

- 2005- One Run dedicated press run, one P2P, **300 data points**
  - Manually plot curves on graph paper, manually enter correction
- 2010- Dedicated press run, 2000 prints, pull every 200, **6000 data pt**
  - Measure 10 P2P with DTP70, Import into G7 s/w
- 2019- No more dedicated runs, Integrated G7 Calibration bar
  - Multiple jobs, multiple operators, multiple coated paper **500K data**

- **Saving $5000 per press per paper type per Curve**
- And much more accurate- actual print conditions!!

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Controlling Conventional Presses

Control Precision- Then Accuracy

- Precision can be optimized by CIP Presets, Closed Loop, Good Ink
- Accuracy can be achieved by G7 Curves, or ICC Profiles/DeviceLink
- G7 Curves with Good Operator EF = 4-6
- If you need < 4 EF Then recommend using ICC Device Links
  - BUT- Have to control every variable:
  - Nips, Fountain, Temperature, Humidity, Plates, Instrument, Paper
  - No Dedicated Press run to create ICC Profile

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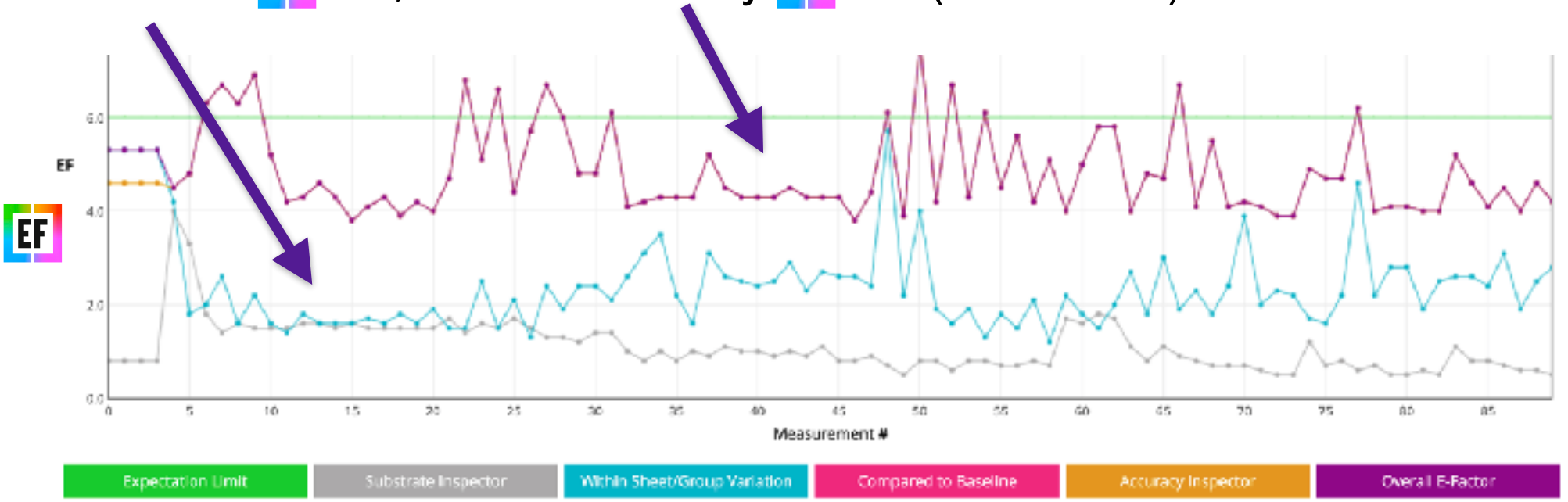
Precision Limits Accuracy

Conventional Presses: Flexo, Offset, Gravure

- Multiple Variables: Plate, Ink keys, Pressures, Fountain Solution
- Bad Precision Limits amount of Accuracy Possible
- Precision EF = 2, limits Accuracy EF = 4 (best case)



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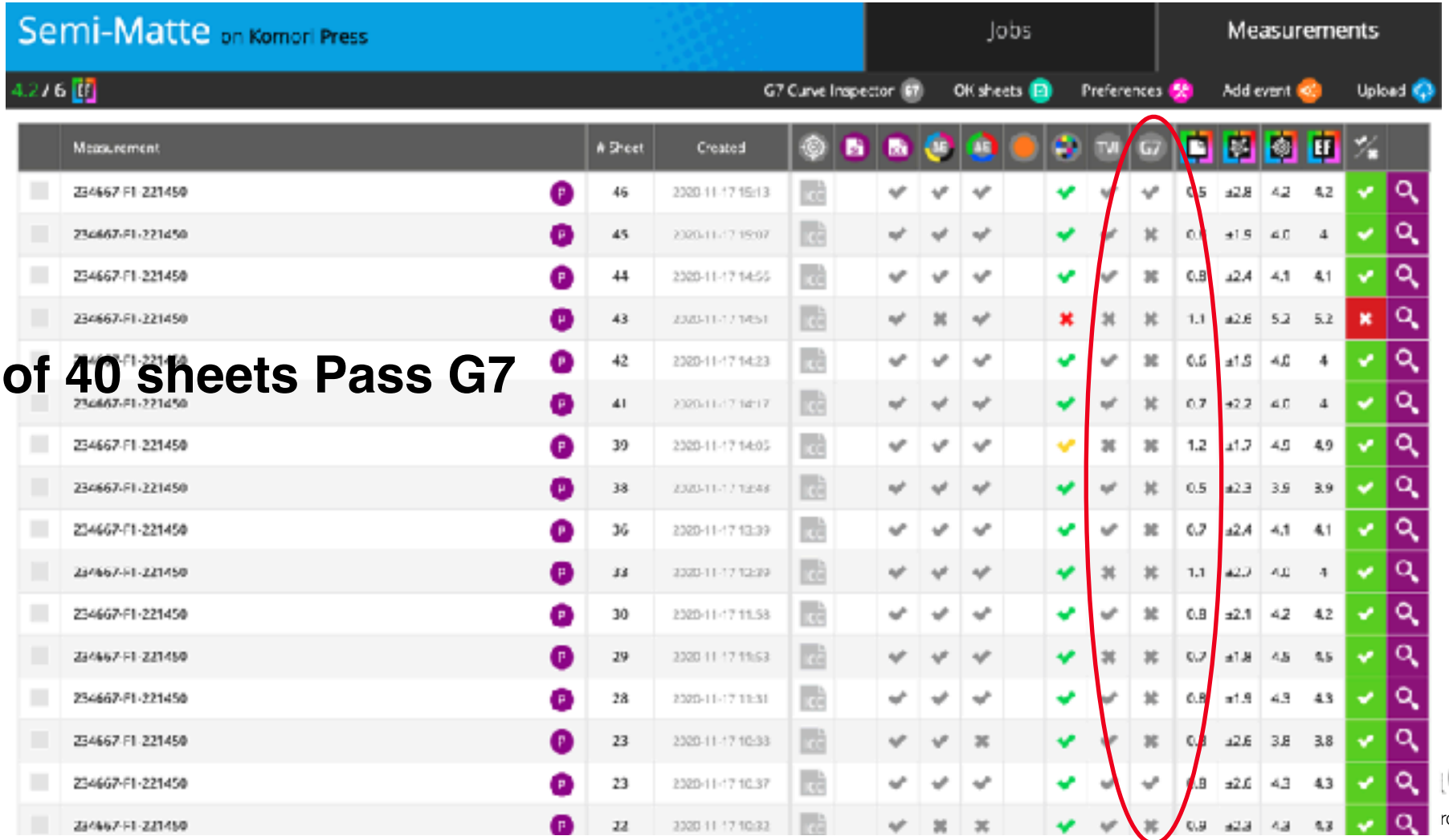
Understand Limits of G7 Curves

Conventional Presses: Flexo, Offset, Gravure



6 out of 40 sheets Pass G7

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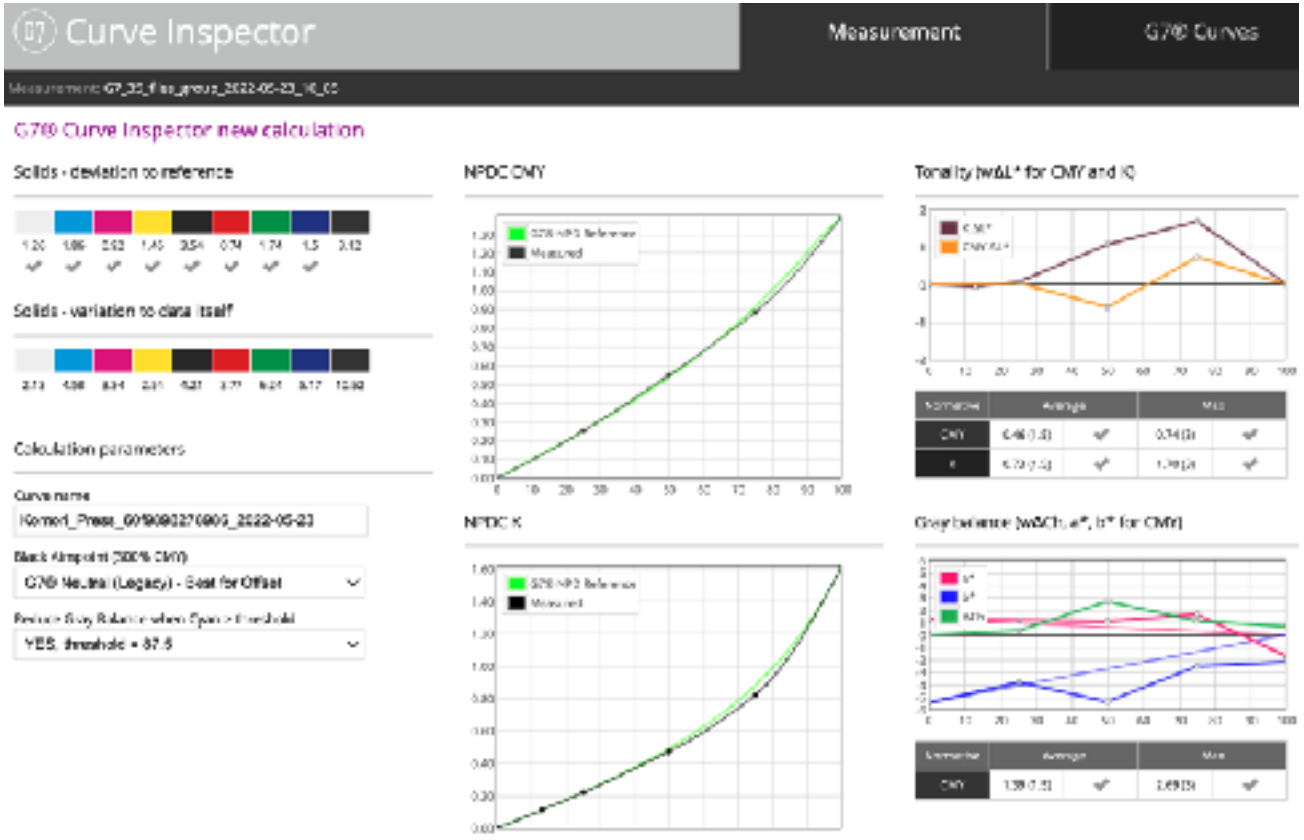
Average of all sheets Pass G7 Compliance

Conventional Presses: Flexo, Offset, Gravure

- 6 out of 40 Sheets PASS G7 Tolerances
- Average of the 40 Sheets PASS G7…



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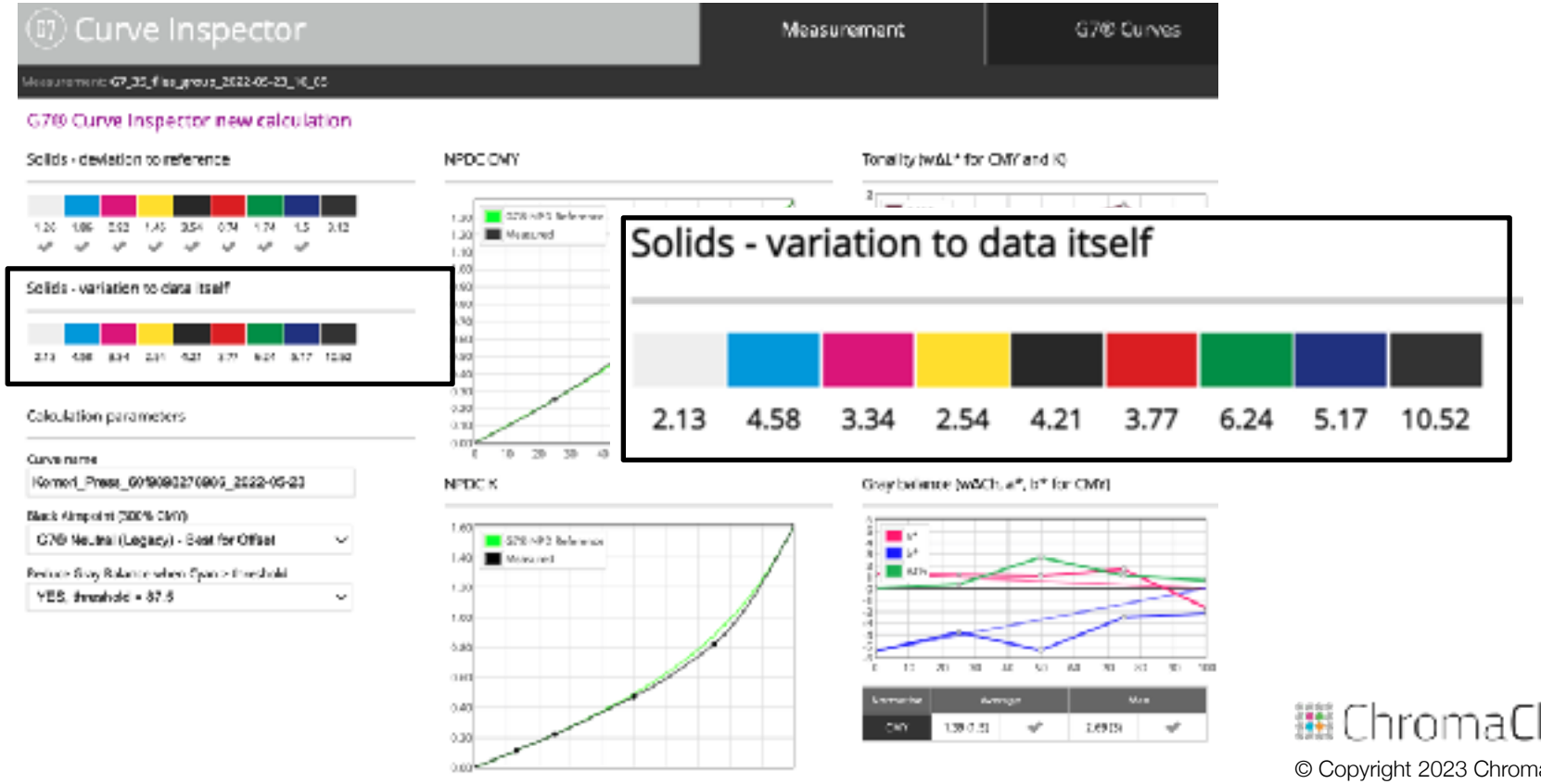
Focus on Precision (Consistency) of Data

Conventional Presses: Flexo, Offset, Gravure

- 6 out of 40 Sheets PASS G7 Tolerances
- Average of the 40 Sheets PASS G7…



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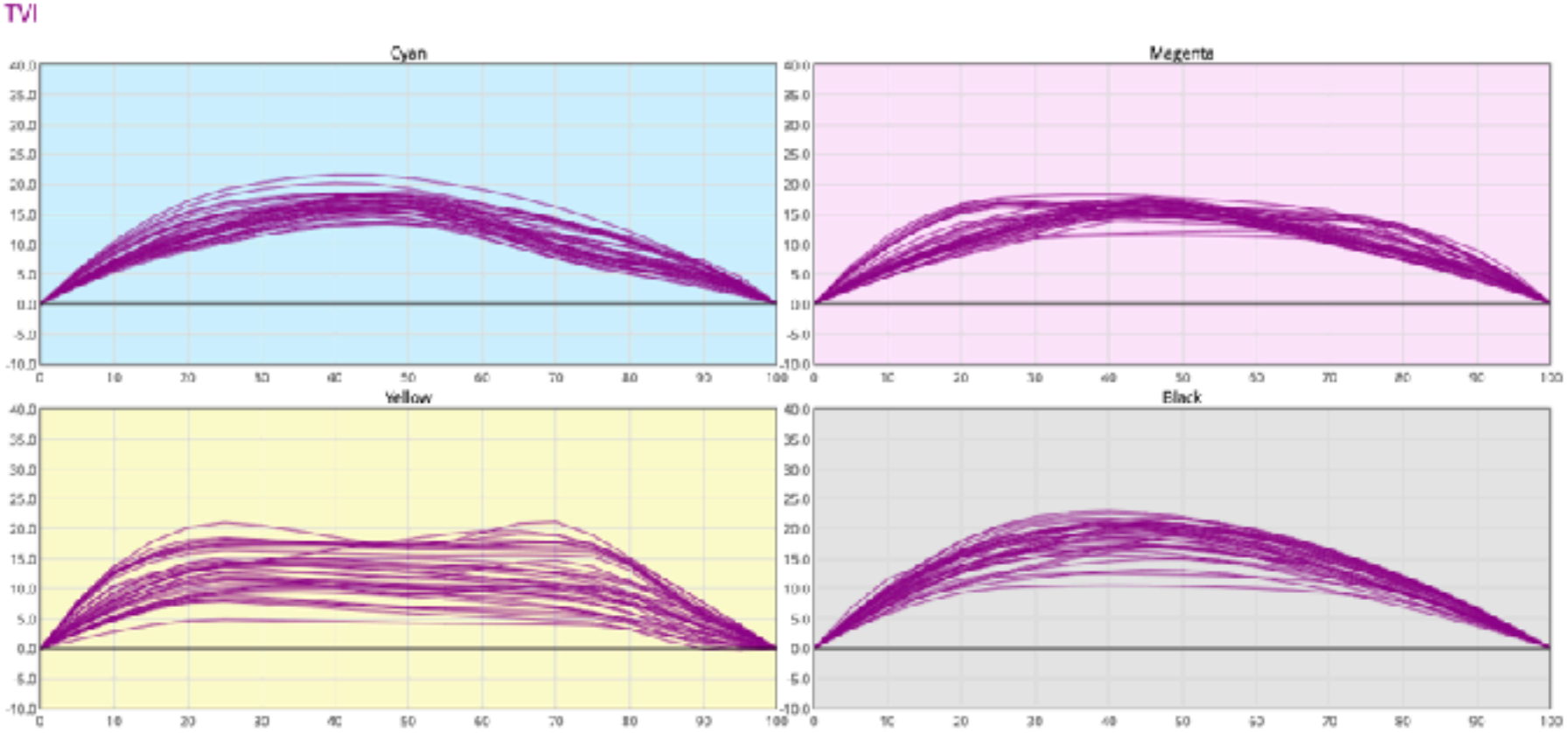
Determine Why Printer is Not Aligned

G7 Curves work for a Density and Dot Gain…

- CMYK Solids are all Correct, but 90% of these prints fail G7



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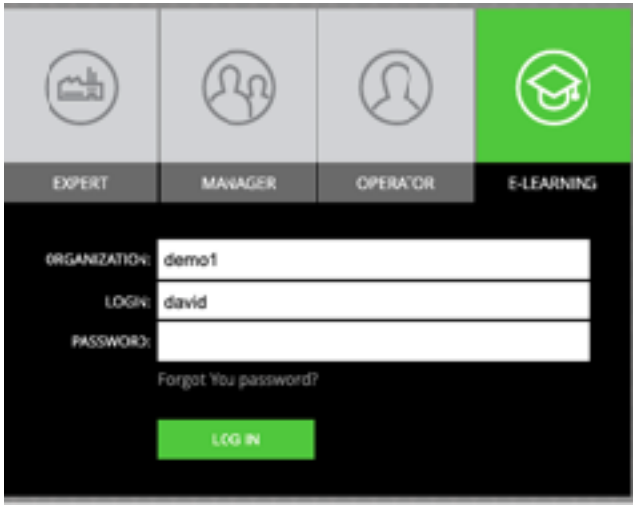
Educate Operators- Density & TVI

Press Operator Course: Controlling Dot Gain (TVI)

- Press Operators needs to control **BOTH** Density and Dot Gain
- 3 Part Course teaches Evenness, Right CMYK Labs, TVI control
- Also have Digital Operators Course for Large Format and Digital



Step One: Press Uniformity - 30 min

Step Two: Controlling Density - 30 min

Step Three: Controlling "Tone Value Increase" (TVI) - 30 min

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Determine Why Printer is Not Aligned

Conventional Press: Flexo, Offset, Gravure, Screen

- Variables- responsible by other people- Finger Pointing
- Plate, Anilox, Screen consistency
- Ink keys even across sheet
- Pressures within each unit, difference between units
- Ink Stripe (Nip Width)
- Fountain Solution
- Capture actual data press runs- **NO DEDICATED PRESS RUNS**
- More…

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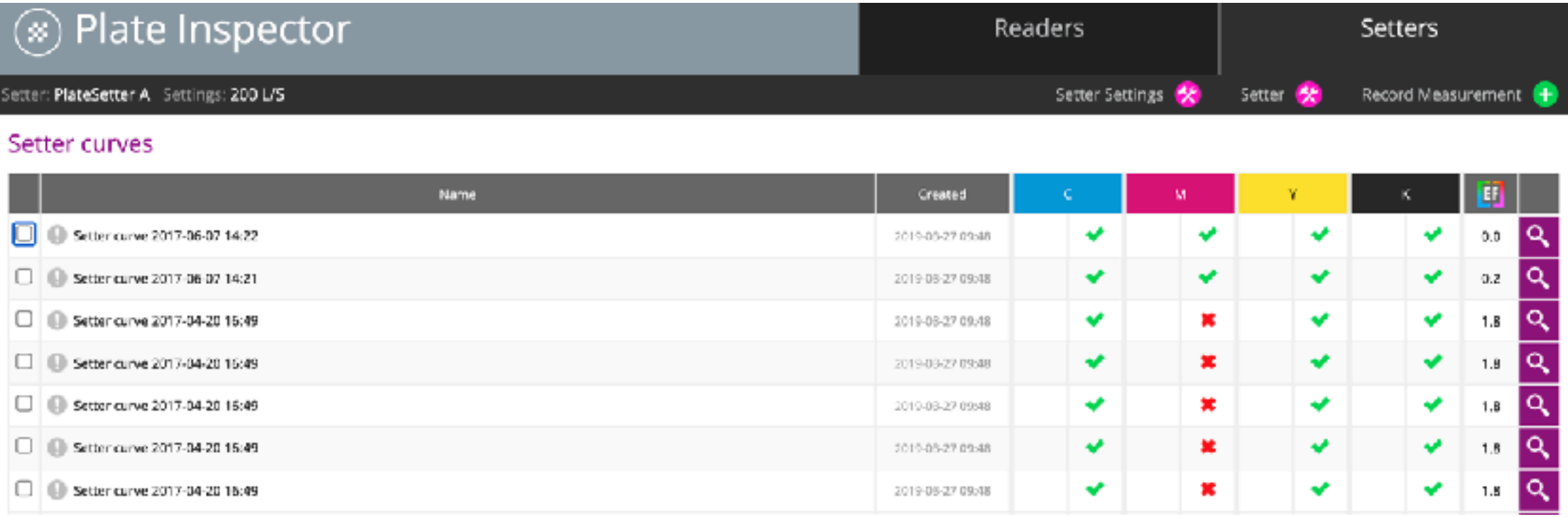
Conventional Variables affecting Precision

Measure Plates: Assign and Document

- Plate Precision: “plates are inconsistent”



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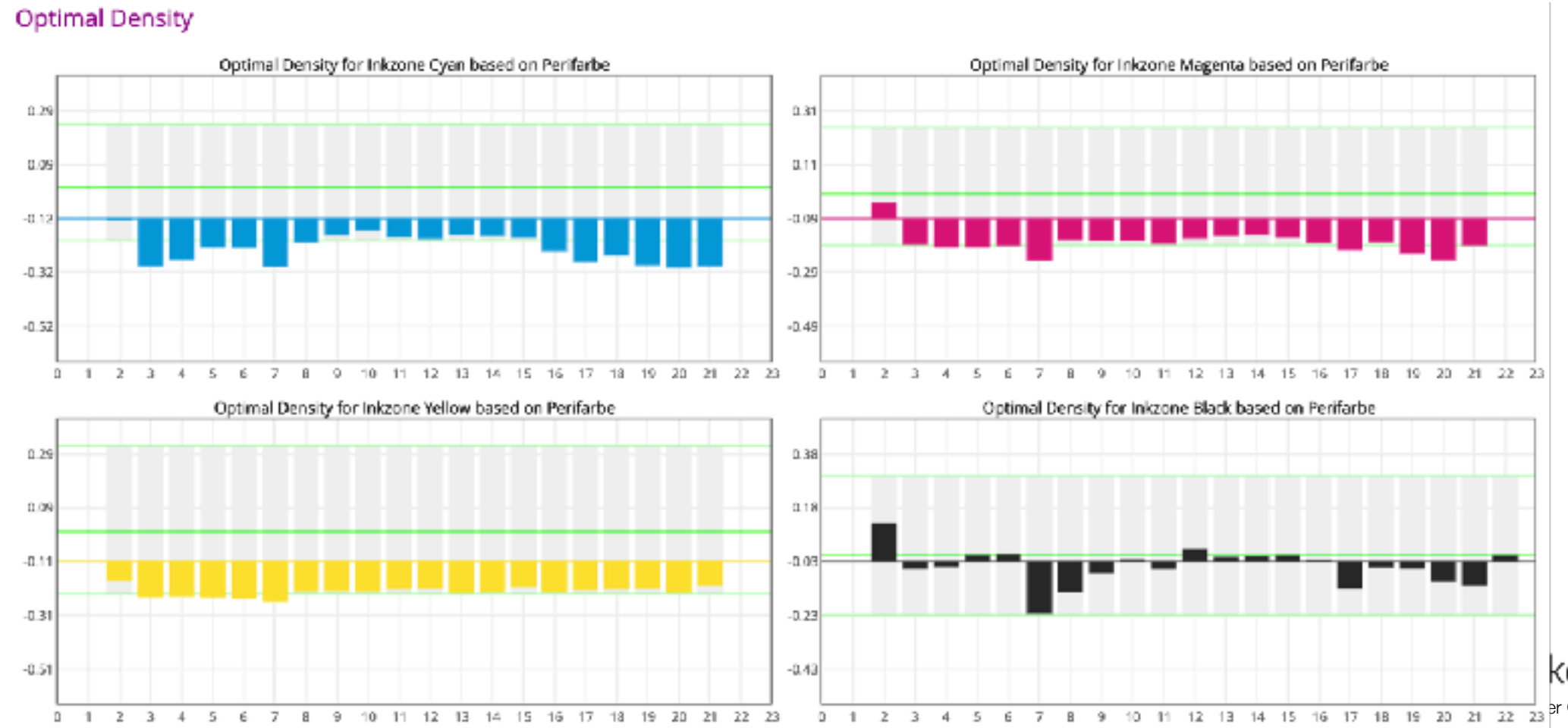
Conventional Variables affecting Precision

Evaluate Ink Key- Good CIP, Closed Loop Improves

- Ink Key Consistency- Evenness across page



Conventional Variables affecting Precision

Measure Pressure: Cylinder to Plate, every unit

- Press Unit Pressures- Within Unit, Between Unit

NIP Inspector

	Unit 1			Unit 2			Unit 3			Unit 4			Unit 5			Unit 6		
	Drive	Center	Operator	Drive	Center	Operator	Drive	Center	Operator	Drive	Center	Operator	Drive	Center	Operator	Drive	Center	Operator
Top	450 -6%	439 -9%	397 -21%	526 +9%	543 +12%	589 +19%	397 -21%	407 -19%	427 -12%	640 +25%	657 +27%	729 +34%	440 -9%	461 -4%	472 -1%	312 -54%	353 -36%	326 -47%
Middle	421 -14%	465 -3%	409 -17%	545 +12%	576 +17%	528 +9%	414 -16%	444 -8%	460 -4%	687 +30%	640 +25%	654 +27%	451 -6%	470 -2%	453 -6%	354 -35%	327 -46%	325 -47%
Bottom	399 -20%	434 -10%	412 -16%	561 +15%	582 +18%	576 +17%	432 -11%	414 -16%	439 -9%	720 +33%	679 +29%	673 +29%	429 -12%	463 -3%	429 -12%	349 -37%	328 -46%	364 -32%

- Higher pressure= high dot gain (TVI)

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Dashboard All Critical Variables

Eliminate Finger Pointing: Green Icon- Checked

- Plate
- Instrument Precision
- Paper
- Fountain Solution
- Nip Pressures
- Lighting
- Temperature/Humidity

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Dashboard All Critical Variables

Eliminate Finger Pointing: Green Icon- Checked

- Plate
- Instrument Precision
- Paper
- Fountain Solution
- Nip Pressures
- Lighting
- Temperature/Humidity

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Submit Press Sheets to Idealliance

Actual Customer job with G7 Verifier

- CC84 Single row inline with ink keys

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G7 Curves Conventional Summary

Follow ChromaChecker 5 Step Process

1. Apply a Production Standard (EF) to your Printing devices
2. Baseline printers which entails data collection
   - Reports how close each is to reference, and to each other
3. Ensure Precision is optimized, before creating Adjustment
4. Adjust G7 using *multiple* measurements, ideally 10,000+ actual prod
5. Verify Operators hitting correct densities and dot gains to get G7

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Compare Accuracy to Each Other

Compare to each other

- We can help with showing the actual EF number differences

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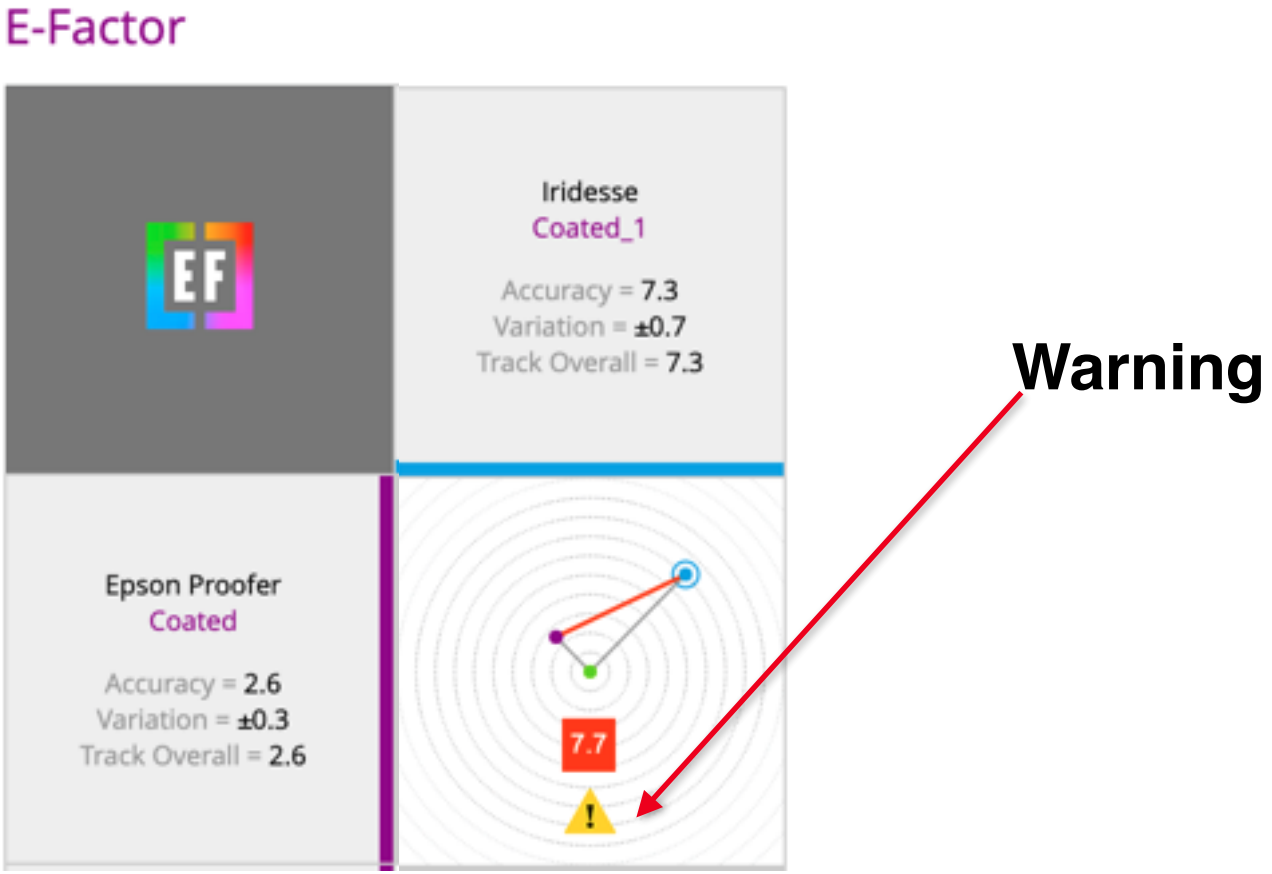
Compare Printers to Determine Adjustment

Compare how close printers match

- Align Printers to each other



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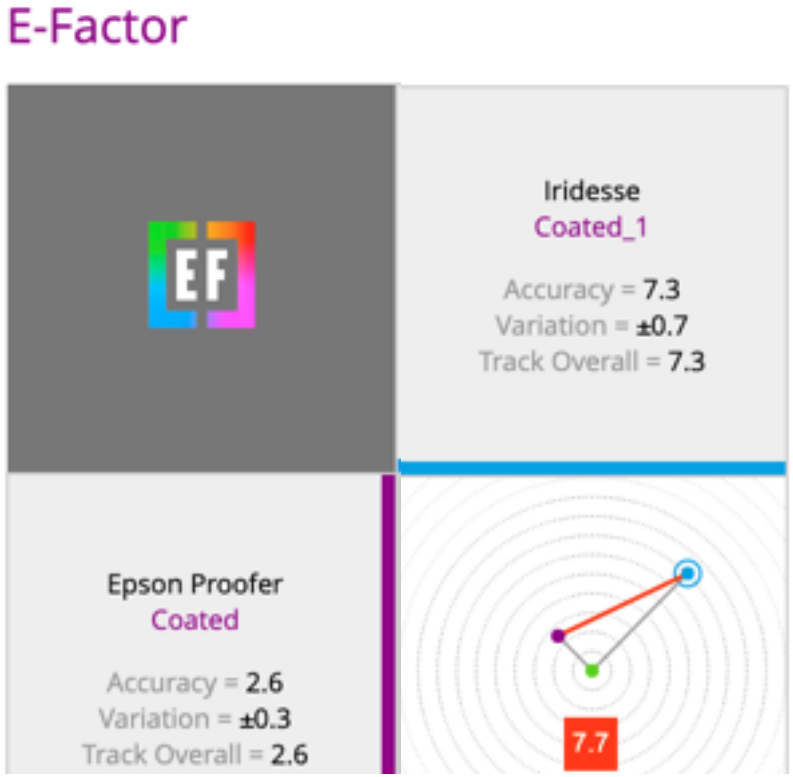
Compare Printers to Determine Adjustment

Compare how close printers match

- Align Printers to each other



Difference between used substrates is greater than 2 (ΔE = 6.9).
To get a better match, we recommend using the same substrate on both devices or if not possible use the Best Match function in Substrate Inspector to find a closer matching substrate.

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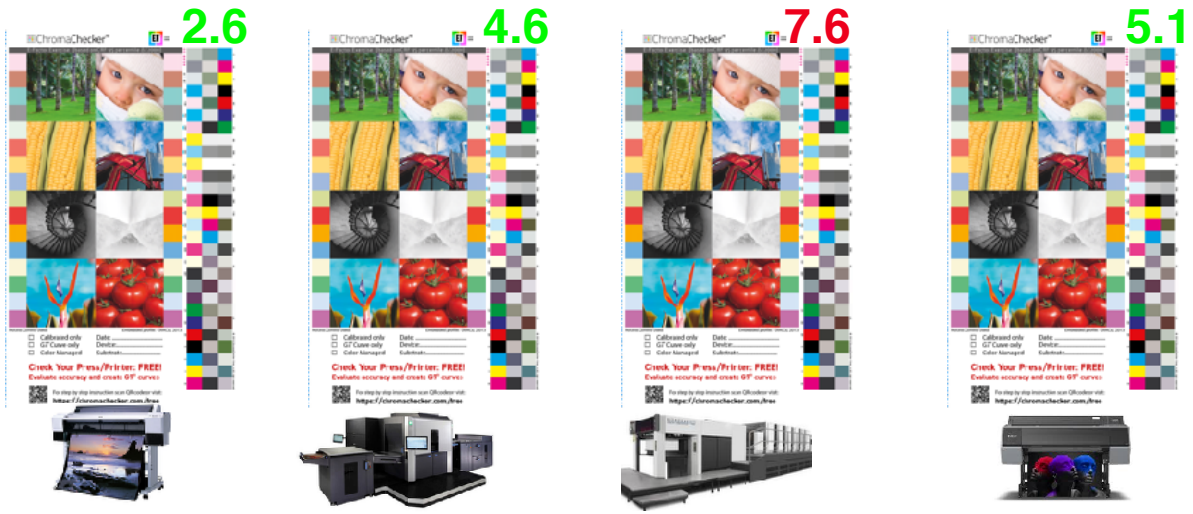
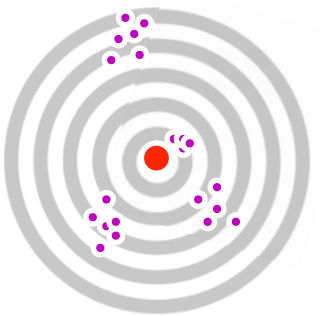
Put into Practice with Digital

ChromaChecker trial

- http://chromachecker.com/trial
- Download file and instructions
- Print file on different printers, then measure:
- Supports an i1, Exact, Techkon, KM Myiro1, Barbieri
- Reports the E-Factor of Printer, and can compare multiple printers





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