ChromaChecker™

Eliminate Dedicated G7 Press

Works for any Print Technology

Presented by: David Hunter

Eliminate G7 Print Runs 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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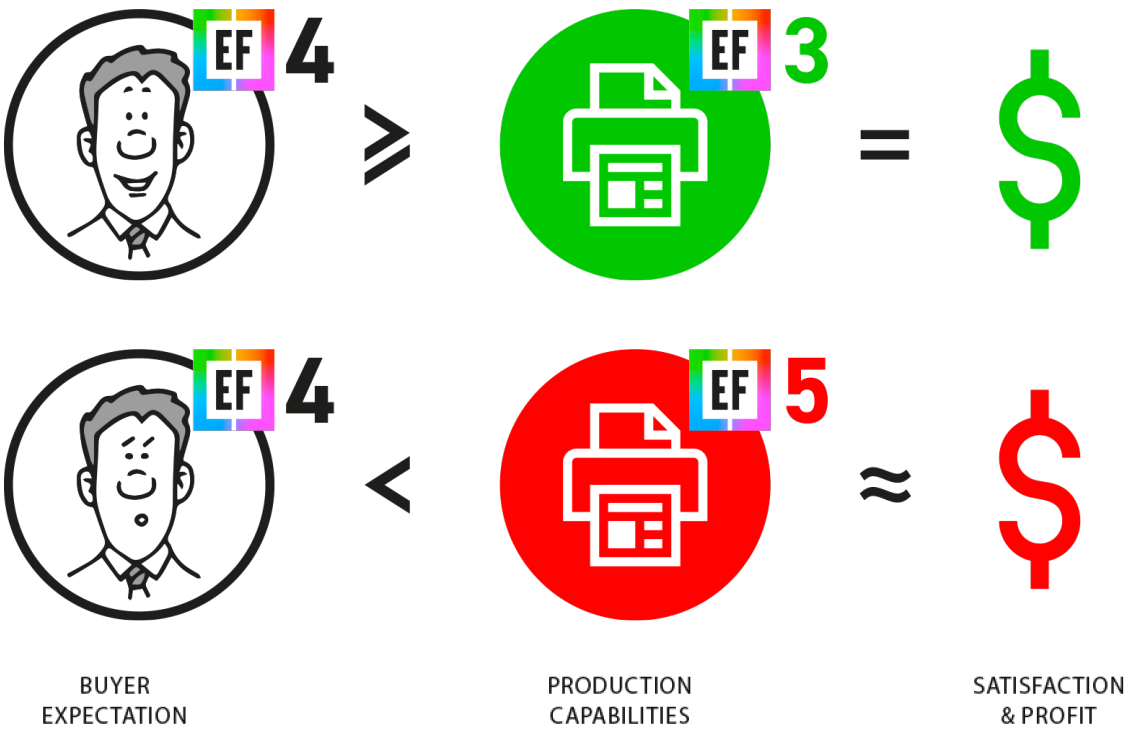
1. Define Production Standard= Color Match

Apply to Print Devices to see if Meet Expectations

- Production Standard defines desired level of Color Match
- Different print technologies have different capabilities



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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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3. 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… Collect 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
- 2018- 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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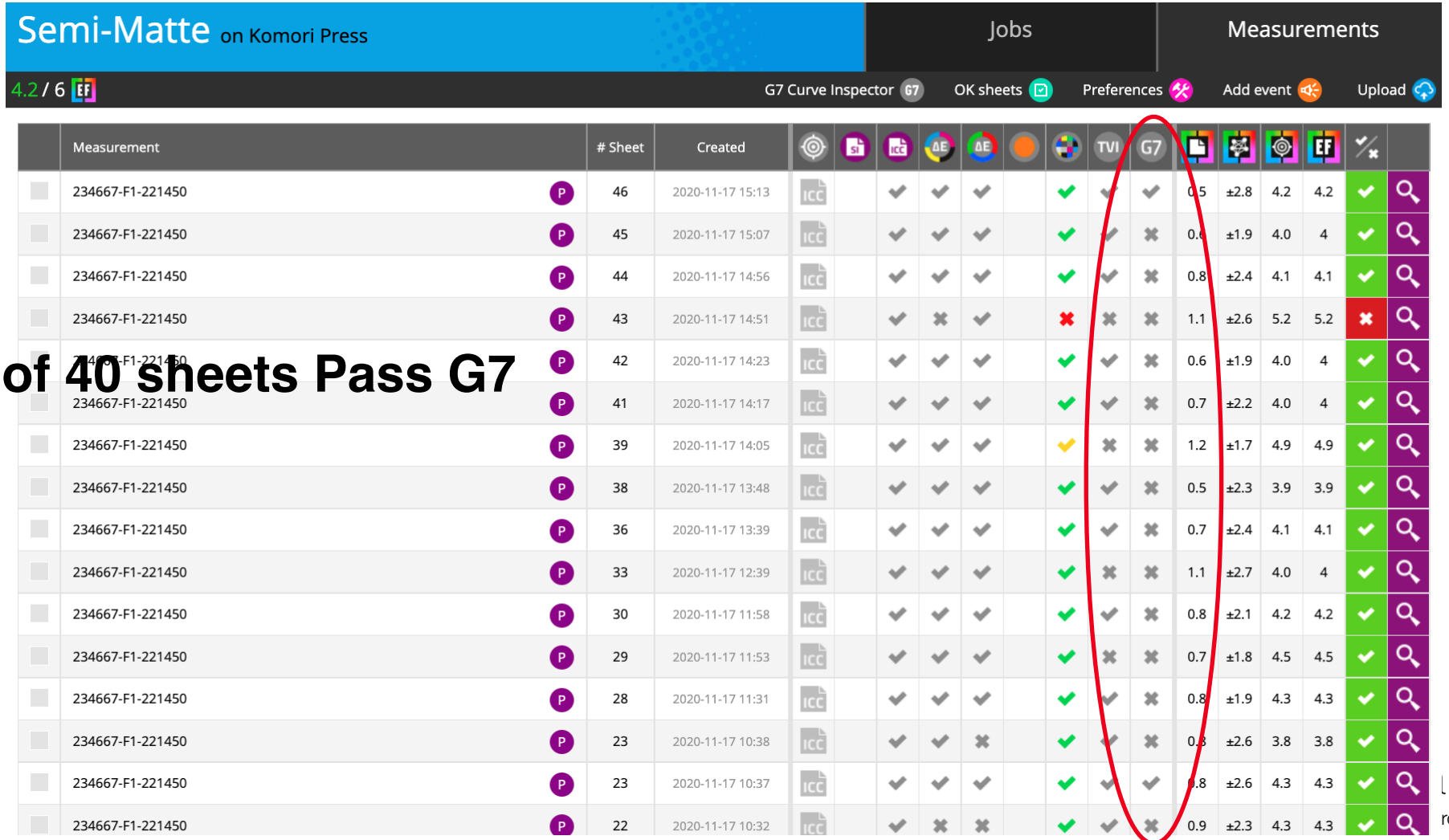
Understand Limits of G7 Curves

Conventional Presses: Flexo, Offset, Gravure

6 out of 40 sheets Pass G7

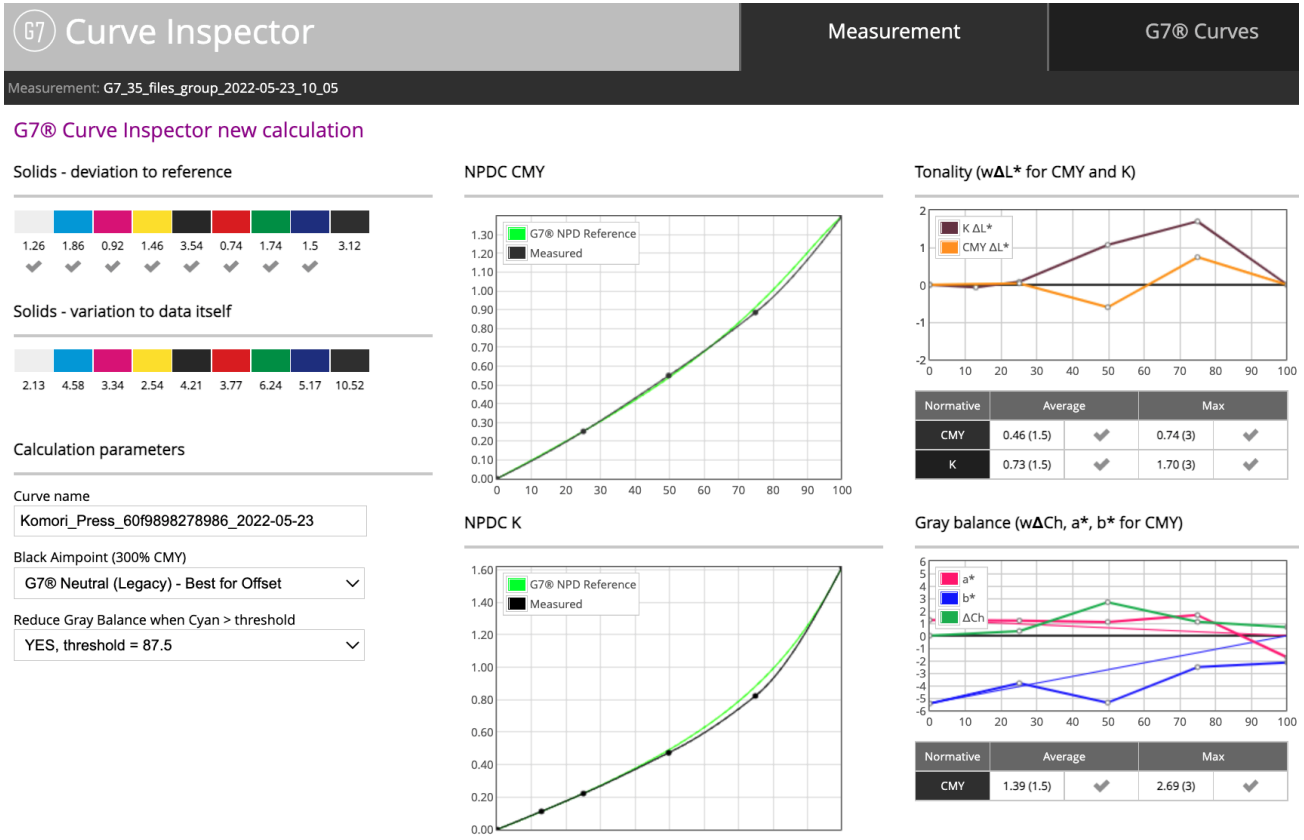


Measurement	# Sheet	Created	TVI	G7				
234667-F1-221450	46	2020-11-17 15:13	✓	✓	0.5	±2.8	4.2	4.2
234667-F1-221450	45	2020-11-17 15:07	✓	✗	0.6	±1.9	4.0	4
234667-F1-221450	44	2020-11-17 14:56	✓	✗	0.8	±2.4	4.1	4.1
234667-F1-221450	43	2020-11-17 14:51	✗	✗	1.1	±2.6	5.2	5.2
234667-F1-221450	42	2020-11-17 14:23	✓	✗	0.6	±1.9	4.0	4
234667-F1-221450	41	2020-11-17 14:17	✓	✗	0.7	±2.2	4.0	4
234667-F1-221450	39	2020-11-17 14:05	✗	✗	1.2	±1.7	4.9	4.9
234667-F1-221450	38	2020-11-17 13:48	✓	✗	0.5	±2.3	3.9	3.9
234667-F1-221450	36	2020-11-17 13:39	✓	✗	0.7	±2.4	4.1	4.1
234667-F1-221450	33	2020-11-17 12:39	✗	✗	1.1	±2.7	4.0	4
234667-F1-221450	30	2020-11-17 11:58	✓	✗	0.8	±2.1	4.2	4.2
234667-F1-221450	29	2020-11-17 11:53	✗	✗	0.7	±1.8	4.5	4.5
234667-F1-221450	28	2020-11-17 11:31	✓	✗	0.8	±1.9	4.3	4.3
234667-F1-221450	23	2020-11-17 10:38	✓	✗	0.8	±2.6	3.8	3.8
234667-F1-221450	23	2020-11-17 10:37	✓	✓	0.8	±2.6	4.3	4.3
234667-F1-221450	22	2020-11-17 10:32	✓	✗	0.9	±2.3	4.3	4.3

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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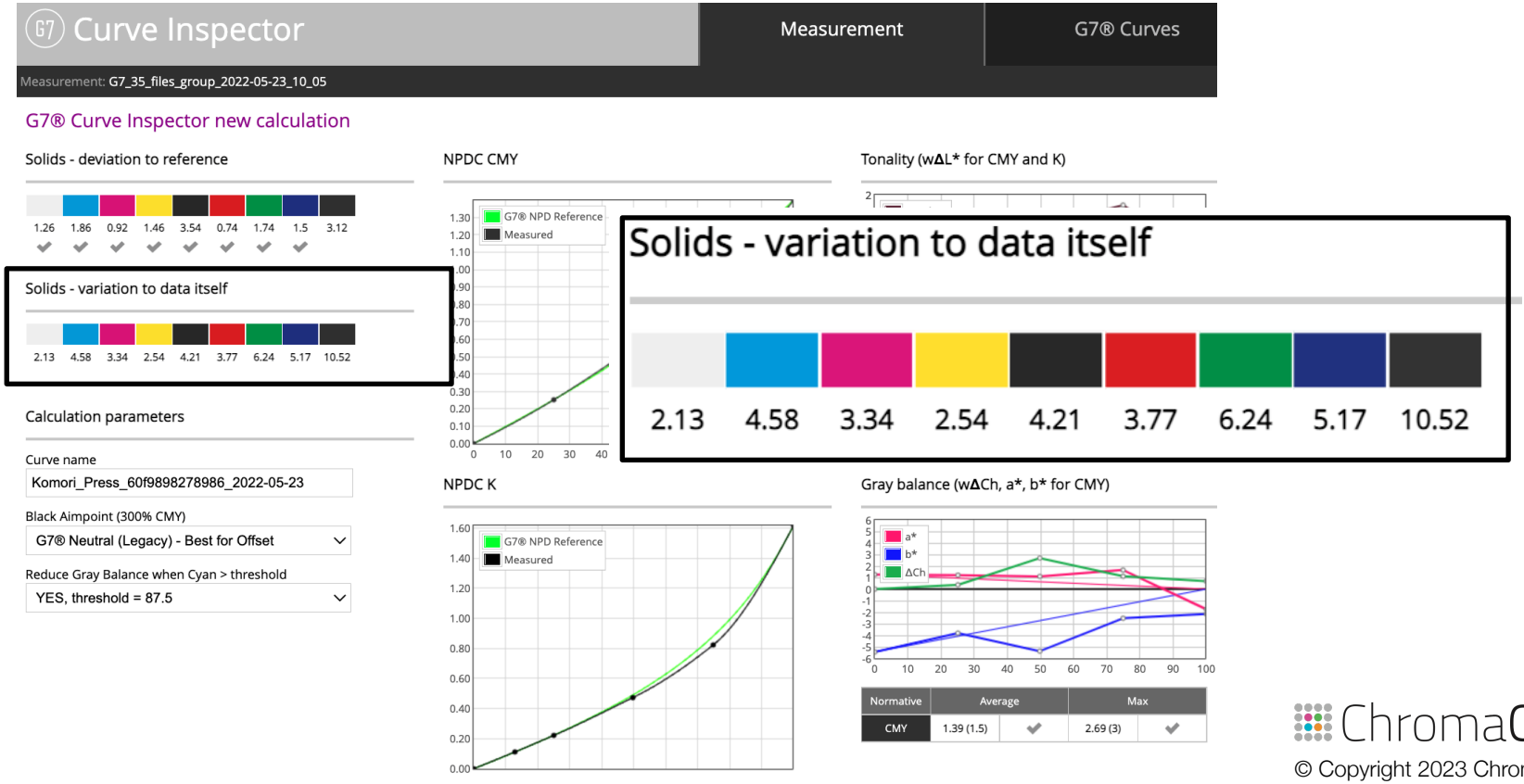
Focus on Precision (Consistency) of Data

Conventional Presses: Flexo, Offset, Gravure

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



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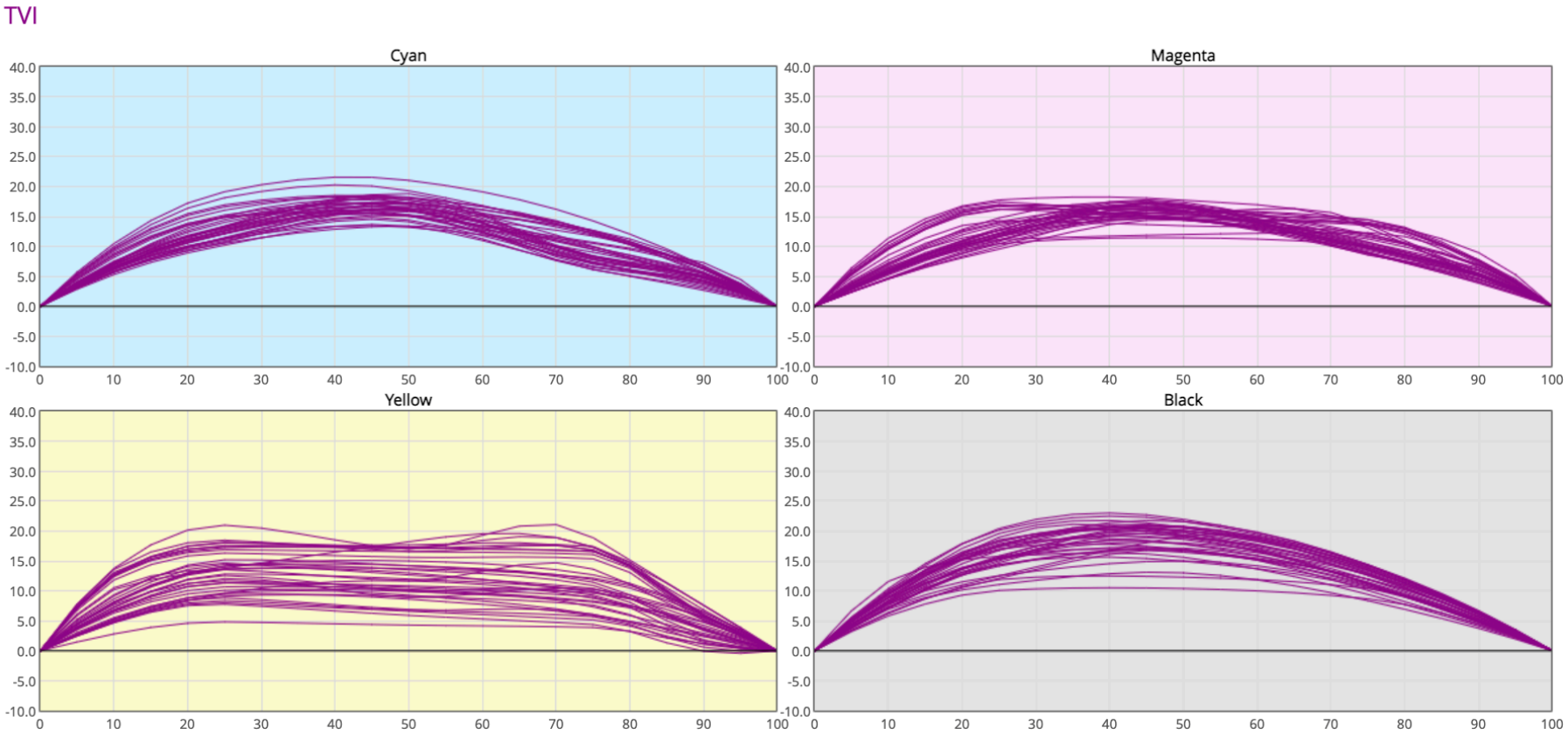
Determine Why Printer is Not Aligned

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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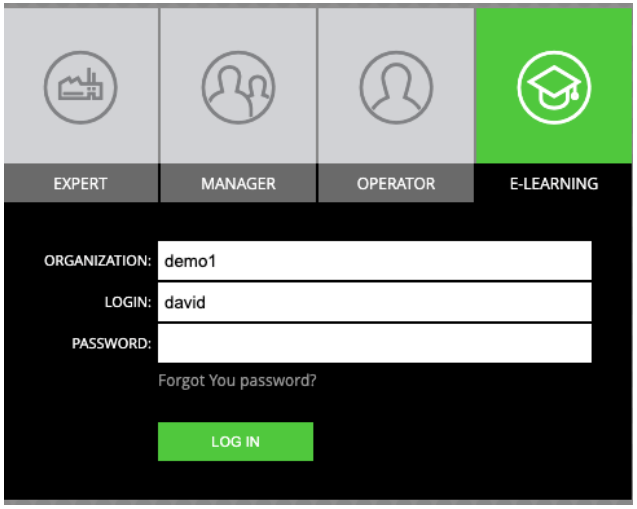
Educate Operators- Density & TVI

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”

Plate Inspector | Readers | Setters

Setter: PlateSetter A   Settings: 200 L/S   Setter Settings   Setter   Record Measurement

Setter curves

	Name	Created	C	M	Y	K	EF
☐	Setter curve 2017-06-07 14:22	2019-03-27 09:48	✓	✓	✓	✓	0.0
☐	Setter curve 2017-06-07 14:21	2019-03-27 09:48	✓	✓	✓	✓	0.2
☐	Setter curve 2017-04-20 16:49	2019-03-27 09:48	✓	✗	✓	✓	1.8
☐	Setter curve 2017-04-20 16:49	2019-03-27 09:48	✓	✗	✓	✓	1.8
☐	Setter curve 2017-04-20 16:49	2019-03-27 09:48	✓	✗	✓	✓	1.8
☐	Setter curve 2017-04-20 16:49	2019-03-27 09:48	✓	✗	✓	✓	1.8
☐	Setter curve 2017-04-20 16:49	2019-03-27 09:48	✓	✗	✓	✓	1.8

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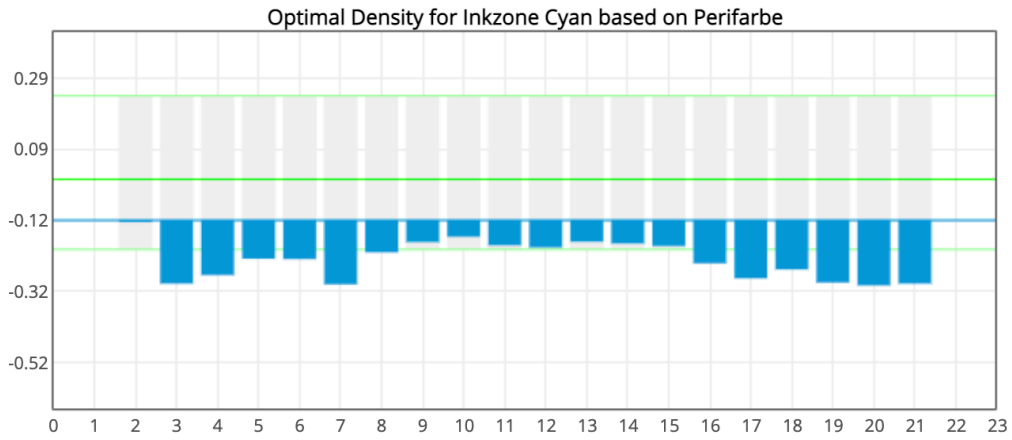
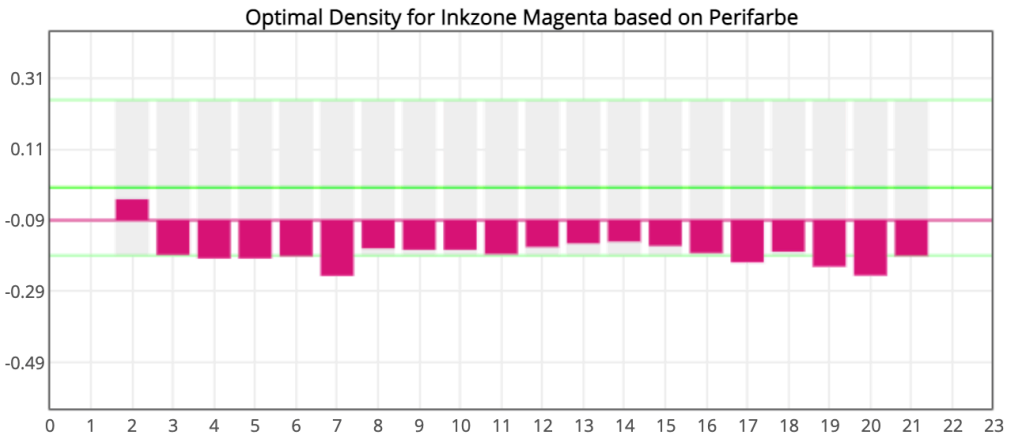
Conventional Variables affecting Precision

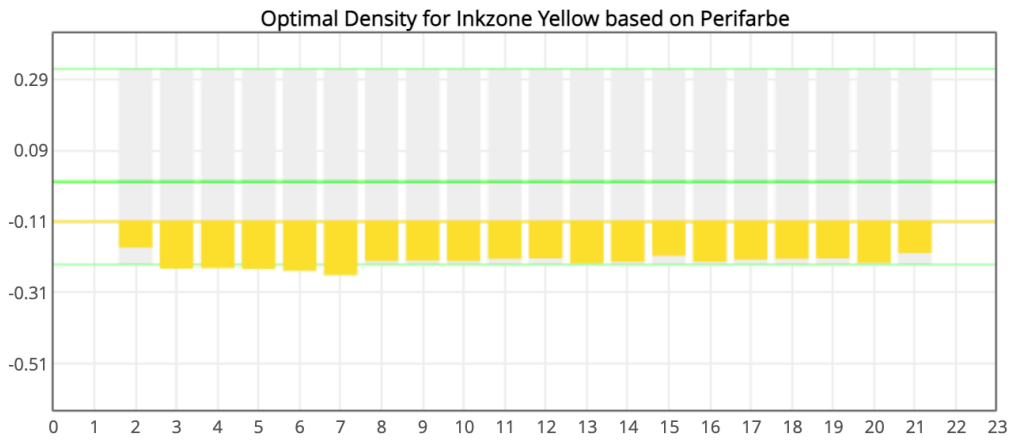
Evaluate Ink Key- Good CIP, Closed Loop Improves

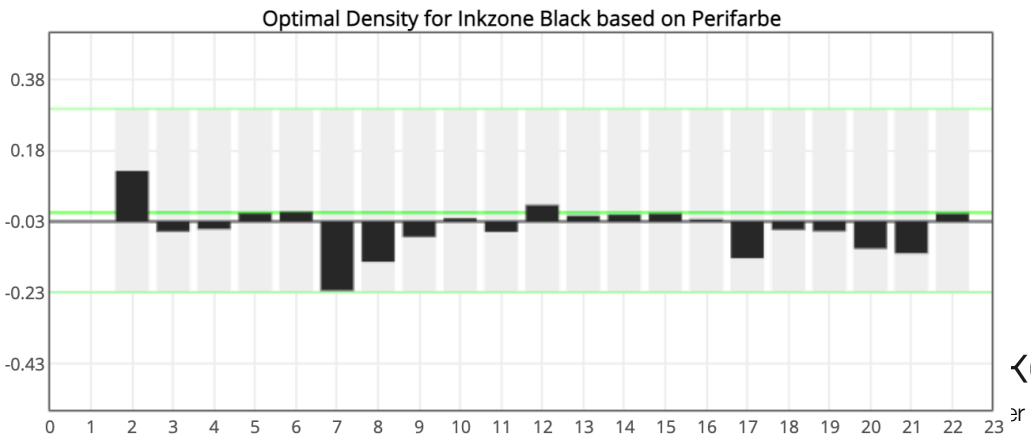
- Ink Key Consistency- Evenness across page

Optimal Density









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 -18%	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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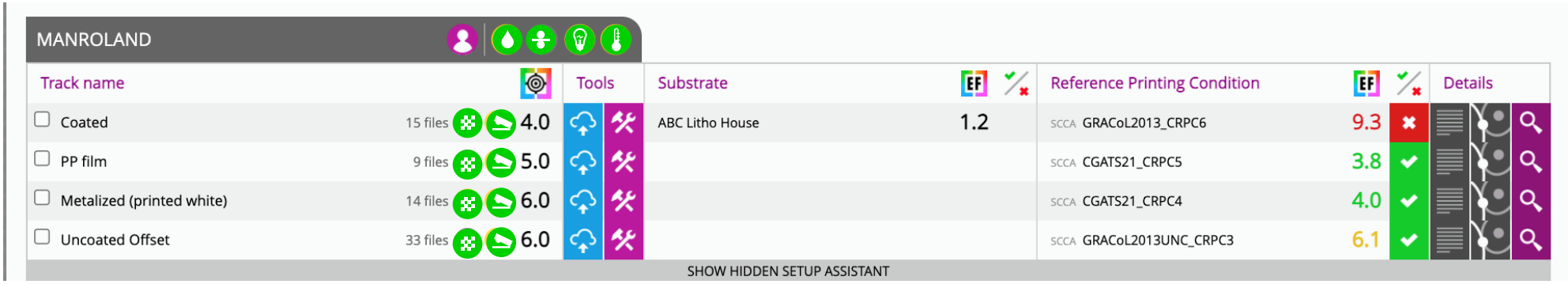
Dashboard All Critical Variables

Eliminate Finger Pointing: Green Icon- Checked

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



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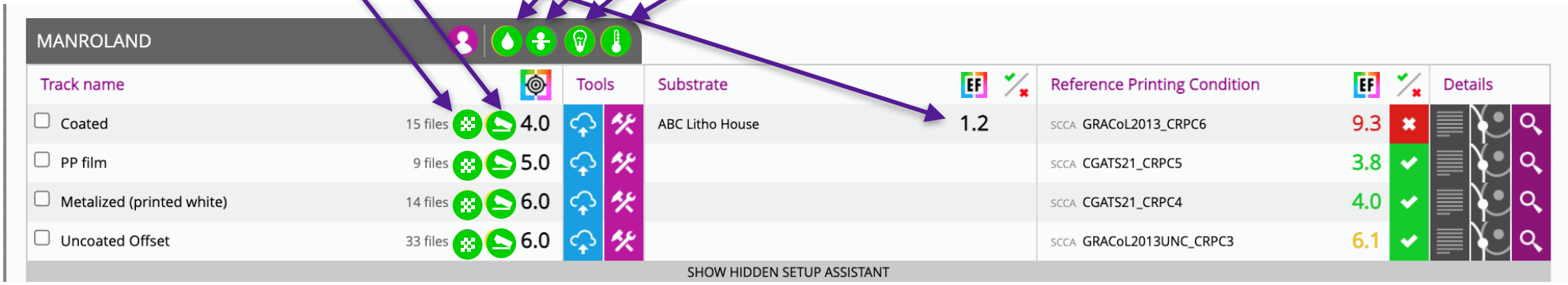

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Submit Press Sheets to Idealliance

Actual Customer job with G7 Verifier

- CC84 Single row inline with ink keys

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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Do it…

Follow ChromaChecker 5 Step Process

1. Use online E-Factor exercise to see 4-8 E-Factor, understanding
2. Collection of data from Presses
   - Intellitrax/HB/KBA/techkon, copy file from exported directory
   - If no press instrument, put CC84 target on press with live work
3. Import data into ChromaChecker Cloud
4. Adjust G7 using *multiple* measurements
5. Verify Operators hitting correct densities and dot gains to get G7

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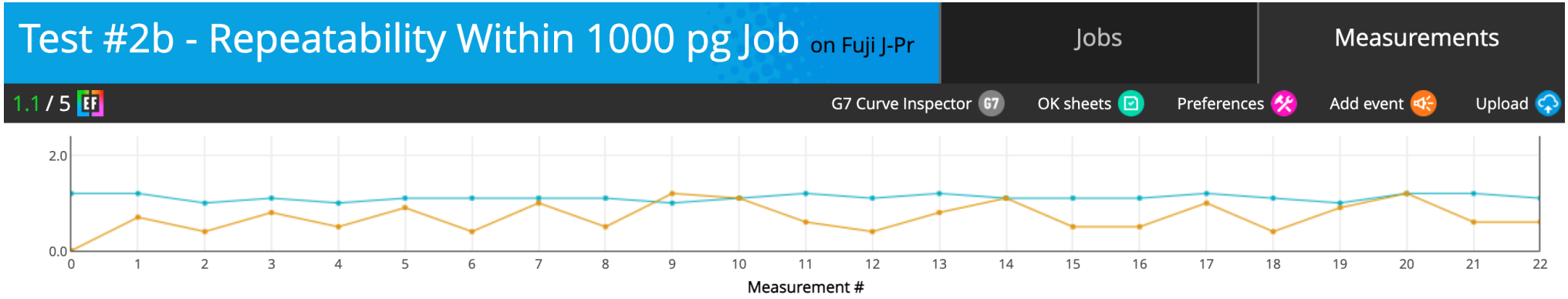
Digital Presses

Presented by: David Hunter

Digital Press: Precision vs. Accuracy Problems

Precision due to mechanics/maintenance printer

- Calibrate to manufacturer recommendations
- Within page uniformity, between page, between job- E-Factor EF
- Due to mechanical aspects of device



- Color Variation within page: EF = 1.1; Between pages: EF = .5 to 1.2

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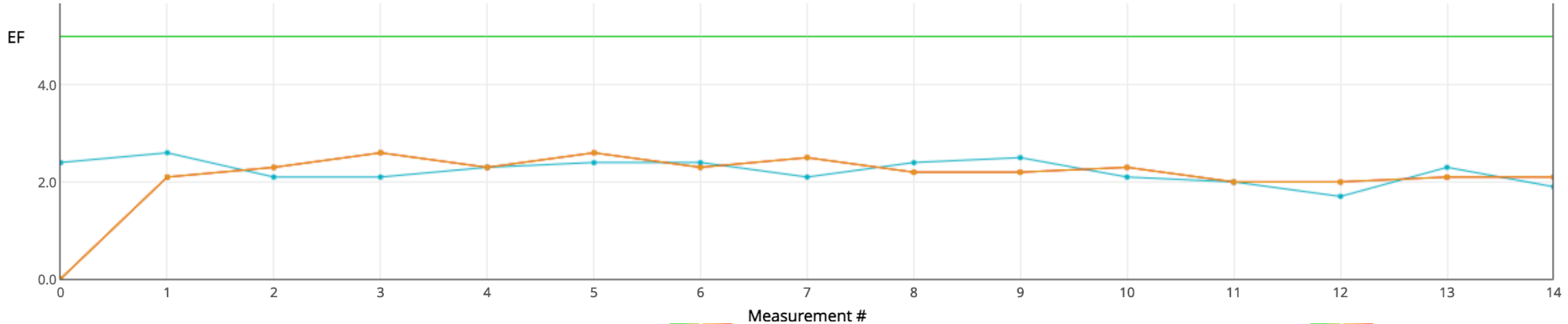
Digital Press: Precision vs. Accuracy Problems

Precision due to mechanics/maintenance Printer

- Within page uniformity, between page, between job- E-Factor
- Due to mechanical aspects of device



- Color Variation within page: EF = 2.2; Between pages: EF = 2
- Color Variation from page 1 to page 50: EF = 2

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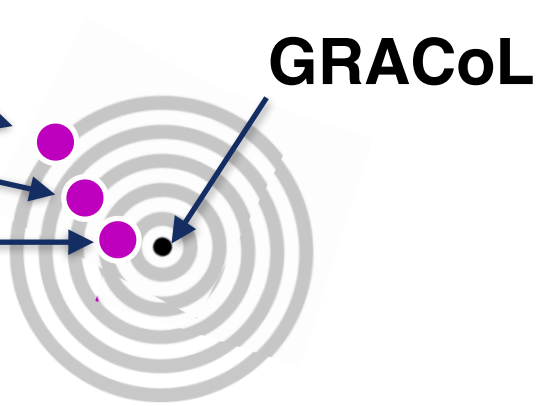
Digital Press: Precision vs. Accuracy

Precision- Inherent limitations of technology

- Calibrate (RIP, DFE dependent), Most RIPs G7 separate step
- Maintain (replacing consumables)

Accuracy- G7 Curves, or ICC Profiles workflow

- HP Indigo- Calibrated to Itself EF = 6.5
- HP Indigo- G7 curve applied EF = 5
- HP Indigo- ICC Profile conversion EF = 2.8



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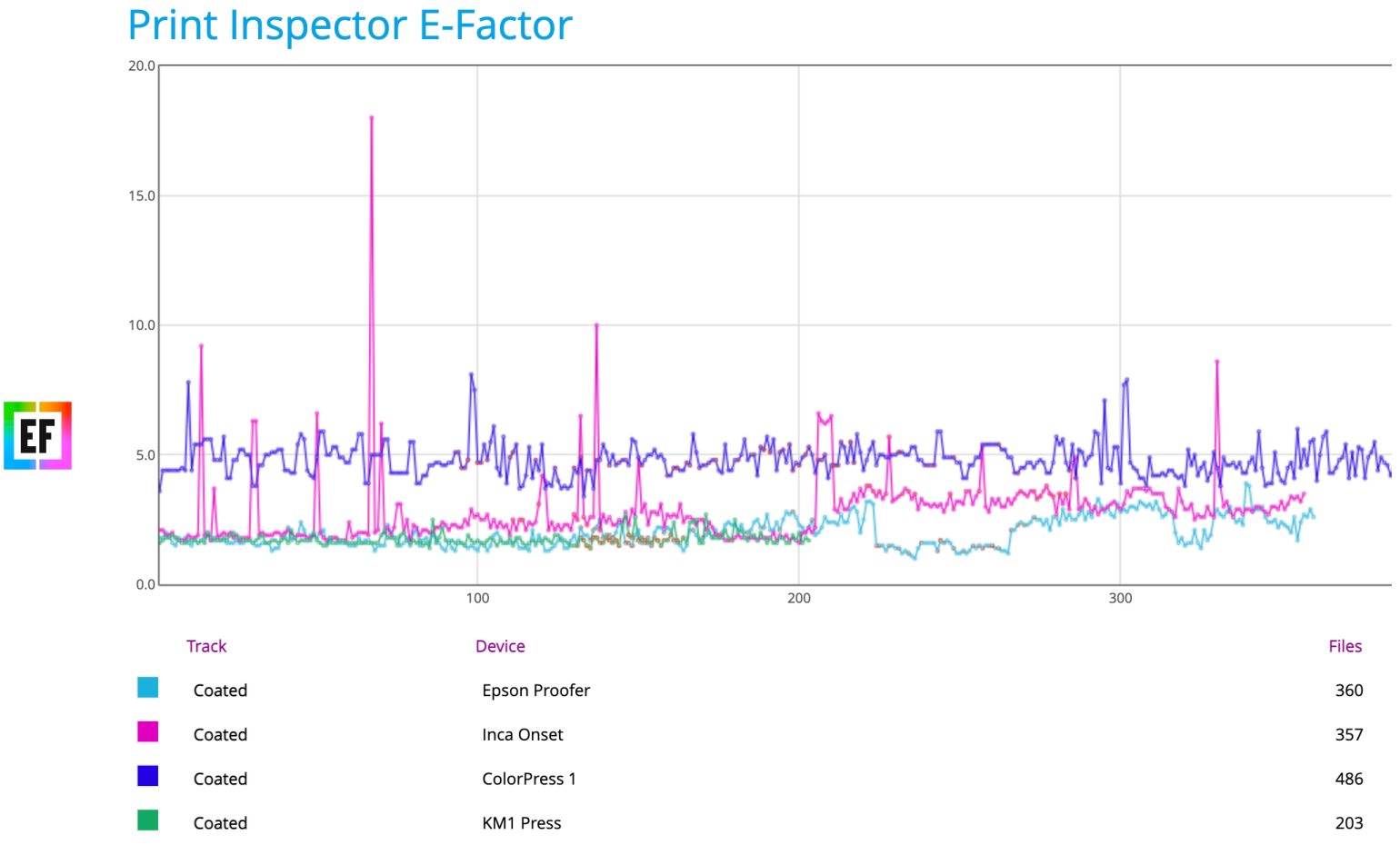
Compare Accuracy Over Time

Compare Multiple Presses- Learn "Normal"

- Lower the better:



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Compare Accuracy to Each Other

Compare to each other

- We can help with showing the actual EF number differences

EF

= 7.7

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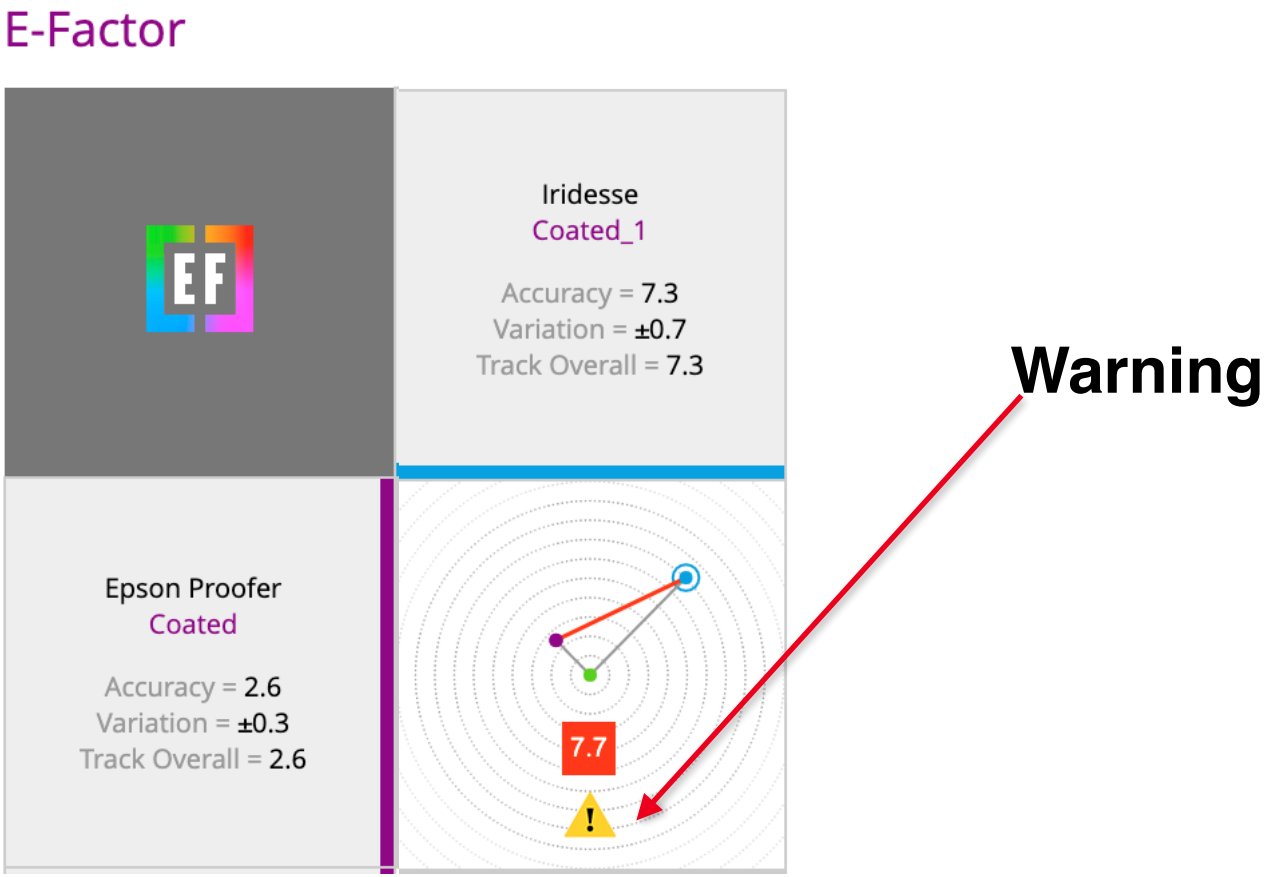
Compare Printers to Determine Adjustment

Compare how close printers match

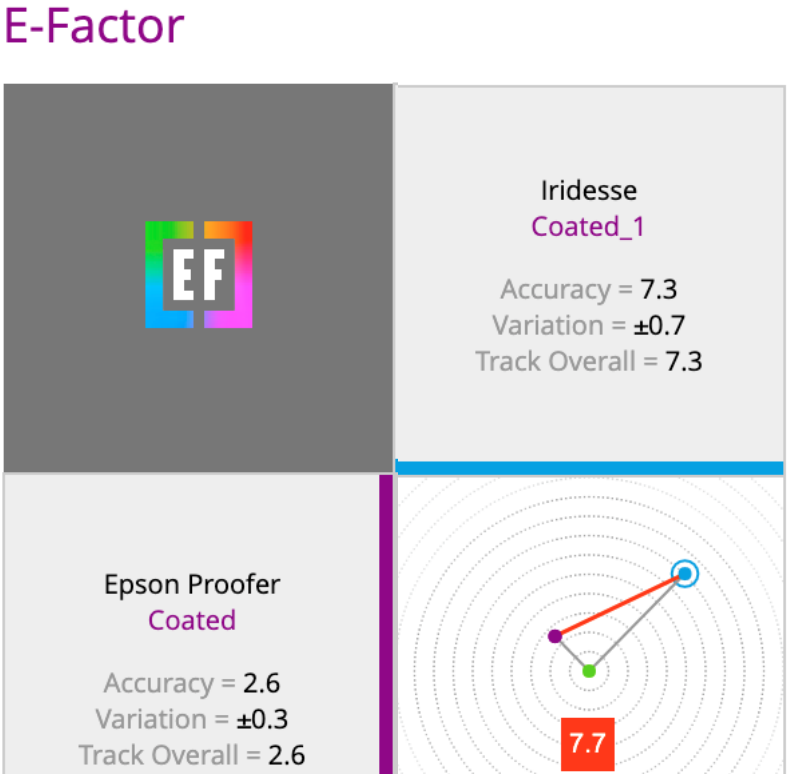
- Align Printers to each other



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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G7 Curves Digital 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 curve
5. Operators check printer routinely

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Next Steps…

Follow Us!

- Register on our ChromaChecker.com web site for news
- Schedule a meeting with us at PrintingUnited show: Atlanta
- Come to our Color Quality Conference/Workshop: Tampa
- Any purchases from our store are 10% off until Friday
- Download Quality file, print to understand where they are
  - https://ChromaChecker.com/trial

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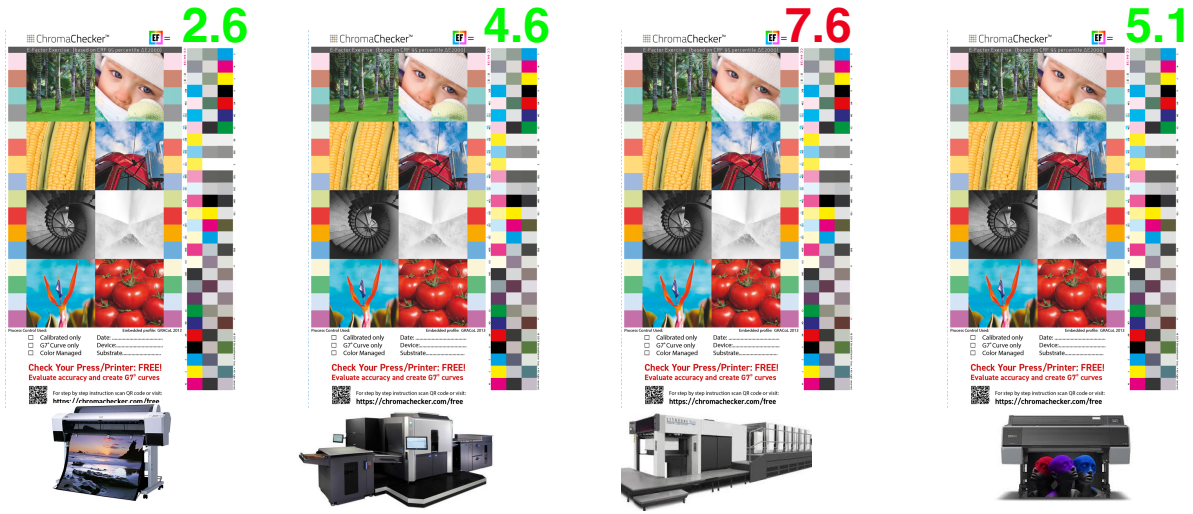
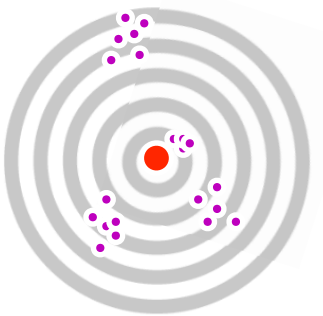
Put into Practice with Digital

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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Qualify How Many Curves or Profiles

Multiple Printers- same substrate

- Need Multiple Profiles for Multiple Printers?

Print Condition Qualifier

Device:	HP Indigo Color Beat
Track:	Substrates
Number of files:	13
Number of groups:	1
ΔE threshold:	3.00
Mode:	95%
File header	File name

Calculate

Group qualification

Group 1:	CRPC	max. ΔE	avg. ΔE	std. dev. ΔE
3 Roland R10 ID 585.txt	CRPC6	2.04	1.77	0.20
2 Roland R5 ID 586.txt	CRPC6	2.47	1.87	0.31
1 Roland R1 ID 607.txt	CRPC6 !	2.69	2.16	0.34
4 Roland R11 ID 584.txt	CRPC6	2.62	2.13	0.42

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