



G7 Curve Creation

Conventional Presses

Presented by: David Hunter

G7 Curve Creation Agenda

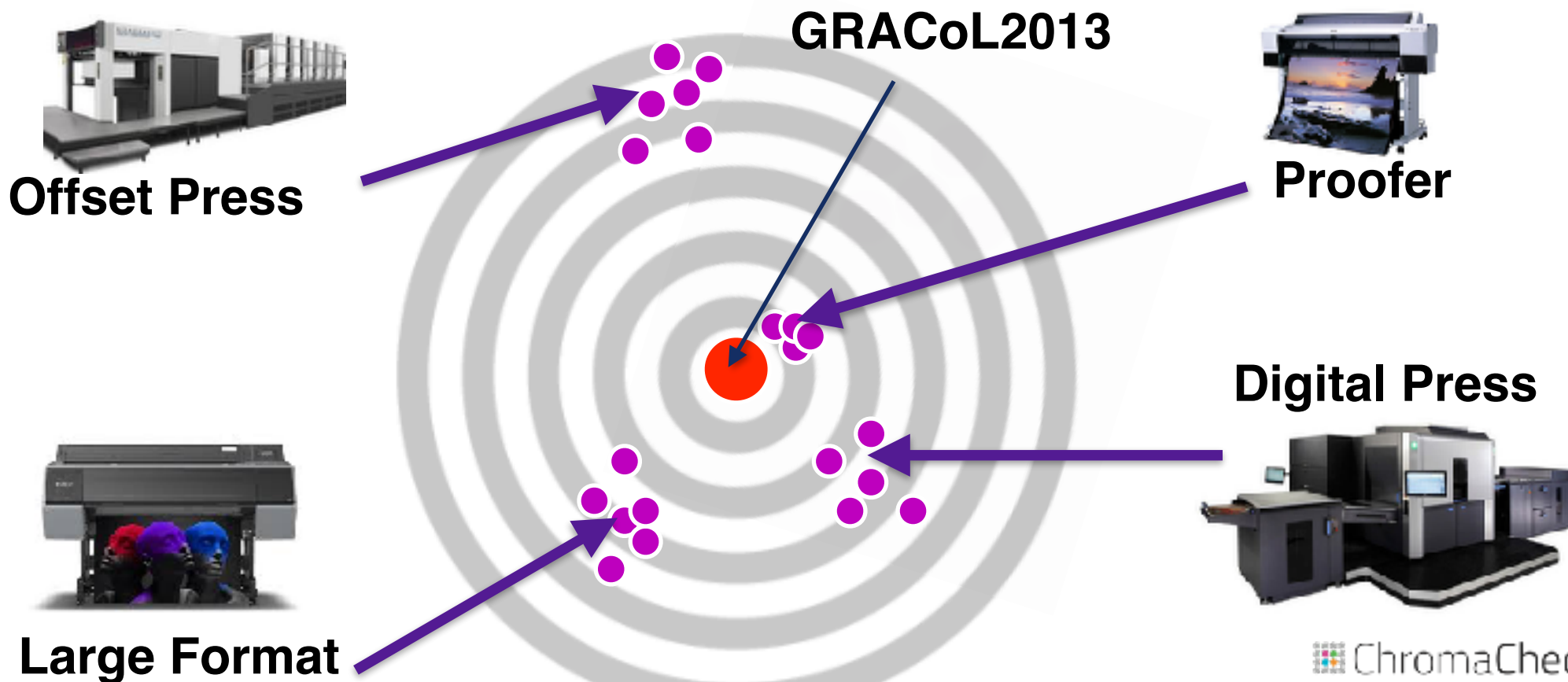
Adjusting Printing Devices- into Alignment

- ◆ 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

2. Baseline Printing Devices

Collect Data to define what is “Normal” for printers

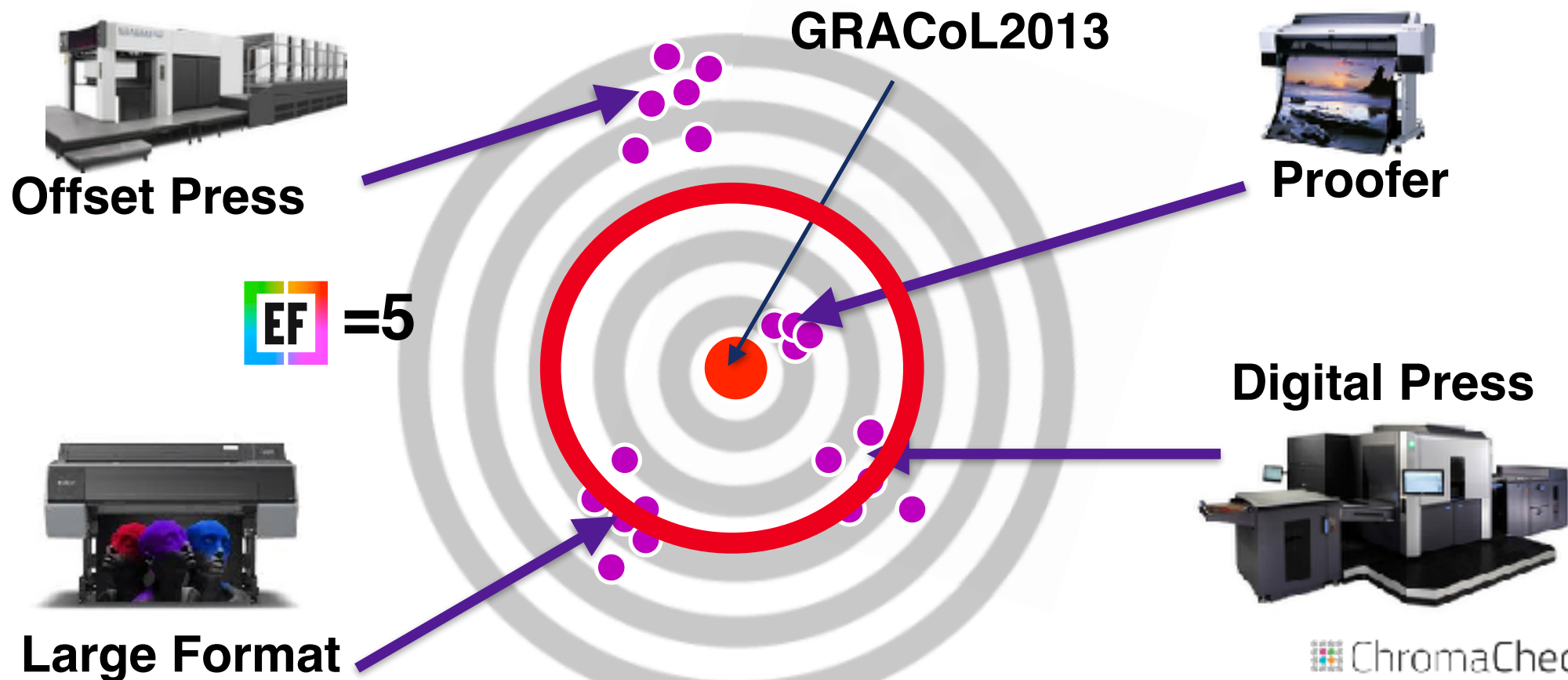
◆ Use E-Factor to quantify Precision and Accuracy!!!



Apply Production Standard- Every Job/Day

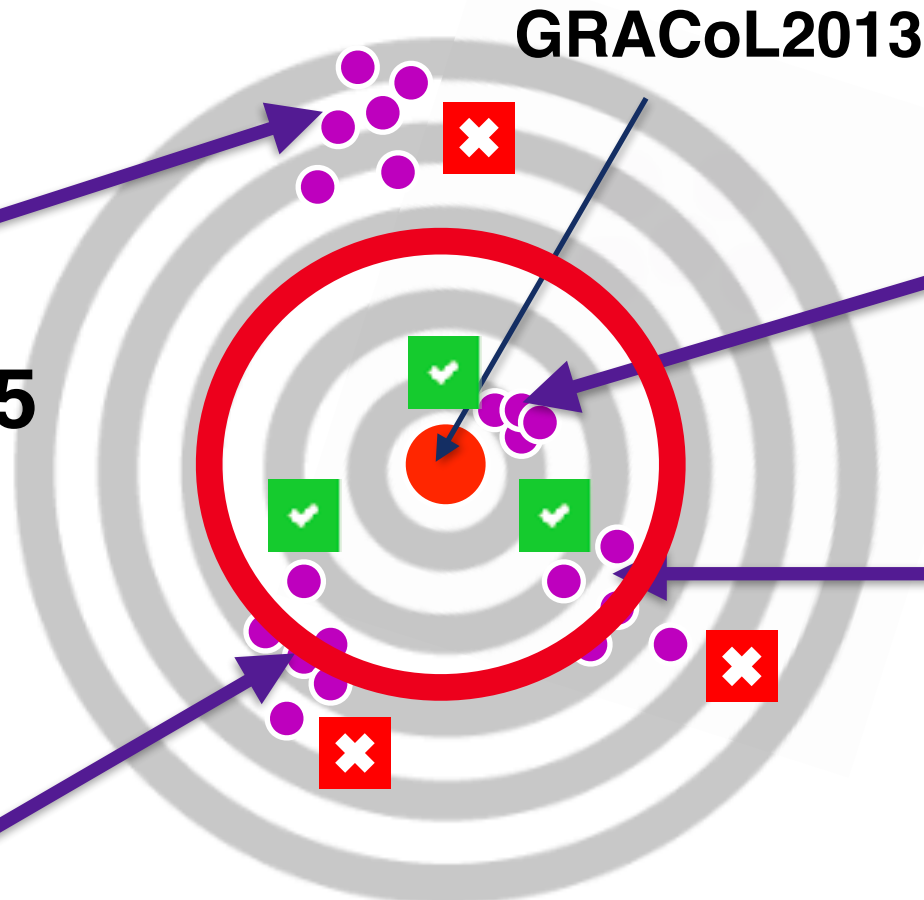
Bullseye- Industry Reference Condition (GRACoL)

◆ How Close is Close Enough: Salable vs Waste



Learn What is Normal for Your Printers

Pass/Fail Criteria based on Salable/Acceptable Result



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!!

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  = 4-6
- ◆ If you need < 4  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

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)



Understand Limits of G7 Curves

Conventional Presses: Flexo, Offset, Gravure

Semi-Matte on Komori Press

Jobs Measurements

4.2 / 6 G7 Curve Inspector OK sheets Preferences Add event Upload

Measurement	# Sheet	Created	CC	✓	✓	✓	✓	✓	✓	G7	0.5	±2.8	4.2	4.2	✓	🔍
Z34667-F1-221450	46	2020-11-17 15:13	CC	✓	✓	✓	✓	✓	✓	✓	0.5	±2.8	4.2	4.2	✓	🔍
Z34667-F1-221450	45	2020-11-17 15:07	CC	✓	✓	✓	✓	✓	✓	✓	0.1	±1.5	4.0	4	✓	🔍
Z34667-F1-221450	44	2020-11-17 14:55	CC	✓	✓	✓	✓	✓	✓	✓	0.8	±2.4	4.1	4.1	✓	🔍
Z34667-F1-221450	43	2020-11-17 14:51	CC	✓	✓	✓	✓	✗	✗	✗	1.1	±2.6	5.2	5.2	✗	🔍
Z34667-F1-221450	42	2020-11-17 14:23	CC	✓	✓	✓	✓	✓	✓	✓	0.5	±1.5	4.0	4	✓	🔍
Z34667-F1-221450	41	2020-11-17 14:17	CC	✓	✓	✓	✓	✓	✓	✓	0.7	±2.2	4.0	4	✓	🔍
Z34667-F1-221450	39	2020-11-17 14:05	CC	✓	✓	✓	✓	✓	✓	✓	1.2	±1.7	4.5	4.9	✓	🔍
Z34667-F1-221450	38	2020-11-17 13:44	CC	✓	✓	✓	✓	✓	✓	✓	0.5	±2.3	3.9	3.9	✓	🔍
Z34667-F1-221450	36	2020-11-17 13:39	CC	✓	✓	✓	✓	✓	✓	✓	0.7	±2.4	4.1	4.1	✓	🔍
Z34667-F1-221450	34	2020-11-17 13:29	CC	✓	✓	✓	✓	✓	✓	✓	1.1	±2.7	4.1	4	✓	🔍
Z34667-F1-221450	30	2020-11-17 11:58	CC	✓	✓	✓	✓	✓	✓	✓	0.8	±2.1	4.2	4.2	✓	🔍
Z34667-F1-221450	29	2020-11-17 11:53	CC	✓	✓	✓	✓	✓	✓	✓	0.7	±1.8	4.5	4.5	✓	🔍
Z34667-F1-221450	28	2020-11-17 11:51	CC	✓	✓	✓	✓	✓	✓	✓	0.8	±1.9	4.3	4.3	✓	🔍
Z34667-F1-221450	23	2020-11-17 10:33	CC	✓	✓	✓	✓	✓	✓	✓	0.8	±2.6	3.8	3.8	✓	🔍
Z34667-F1-221450	23	2020-11-17 10:37	CC	✓	✓	✓	✓	✓	✓	✓	0.8	±2.6	4.3	4.3	✓	🔍
Z34667-F1-221450	22	2020-11-17 10:32	CC	✓	✓	✓	✓	✓	✓	✓	0.9	±2.3	4.3	4.3	✓	🔍

6 out of 40 sheets Pass G7

Average of all sheets Pass G7 Compliance

Conventional Presses: Flexo, Offset, Gravure

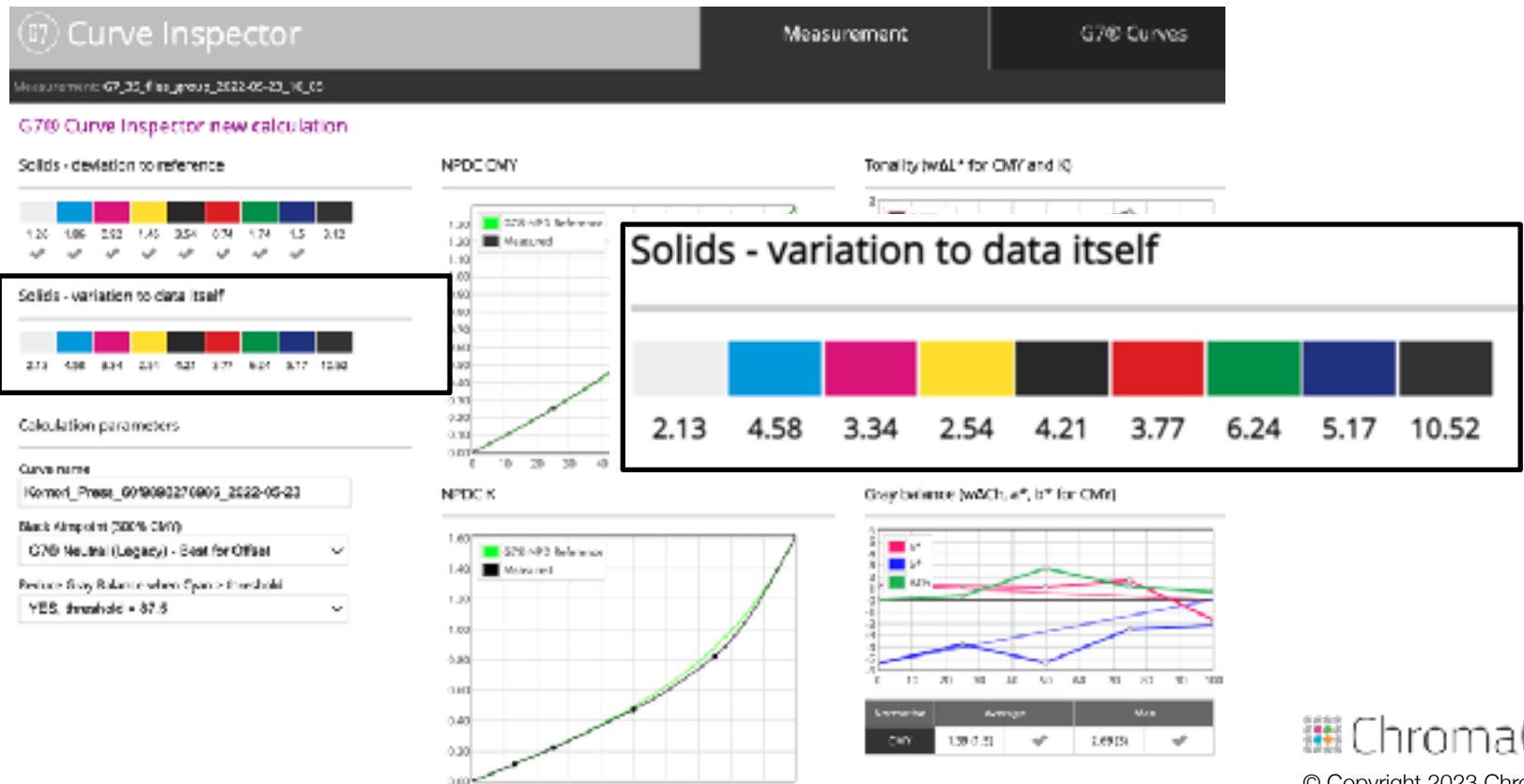
- ◆ 6 out of 40 Sheets PASS G7 Tolerances
- ◆ Average of the 40 Sheets PASS G7...



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...

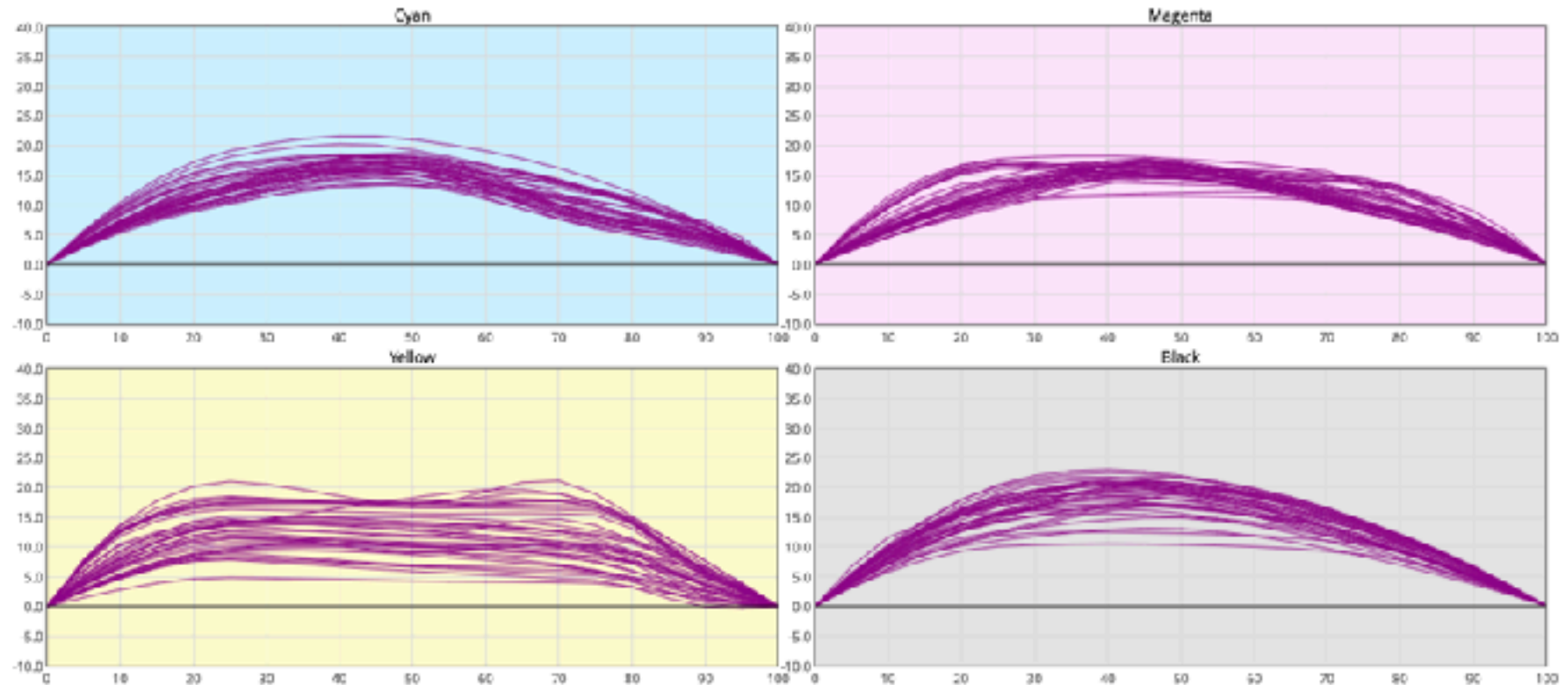


Determine Why Printer is Not Aligned

G7 Curves work for a Density and Dot Gain...

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

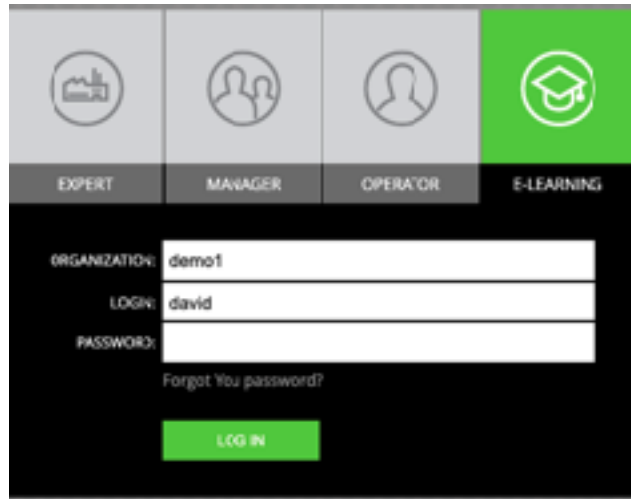
TVI







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



			
EXPERT	MANAGER	OPERATOR	E-LEARNING

ORGANIZATION:

LOGIN:

PASSWORD:

[Forgot Your password?](#)

Step One: Press Uniformity - 30 min

Step Two: Controlling Density - 30 min

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

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...

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

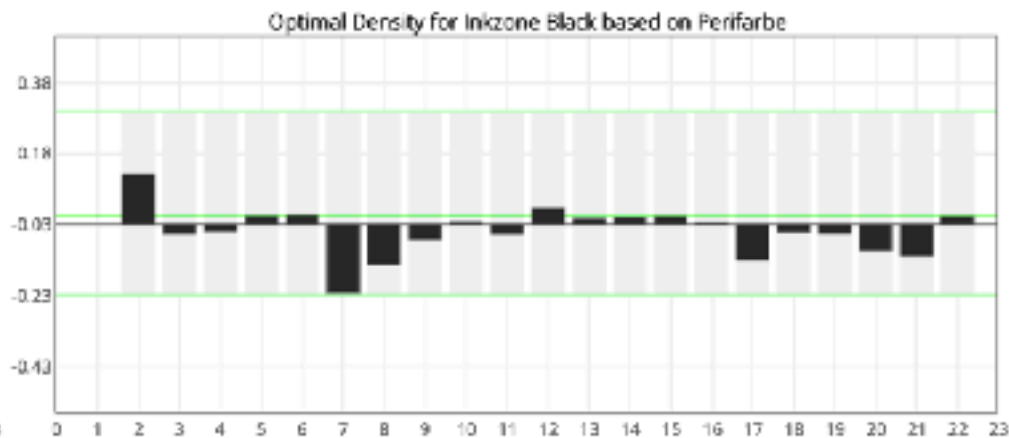
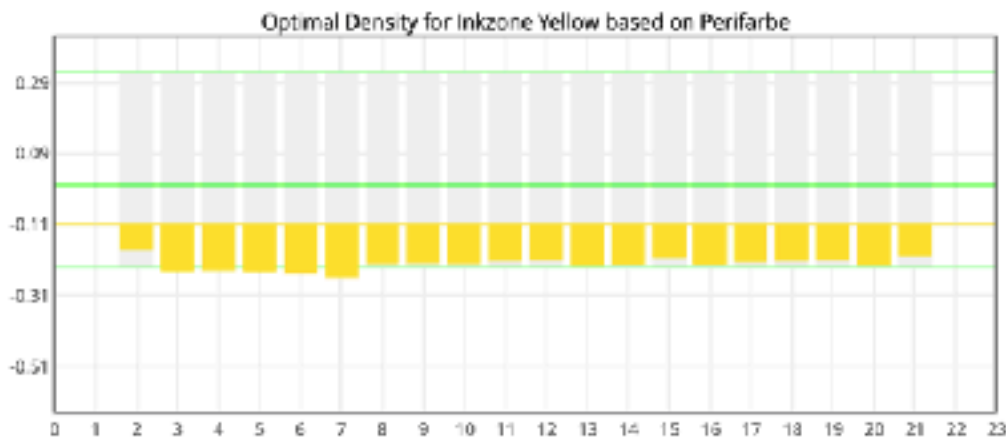
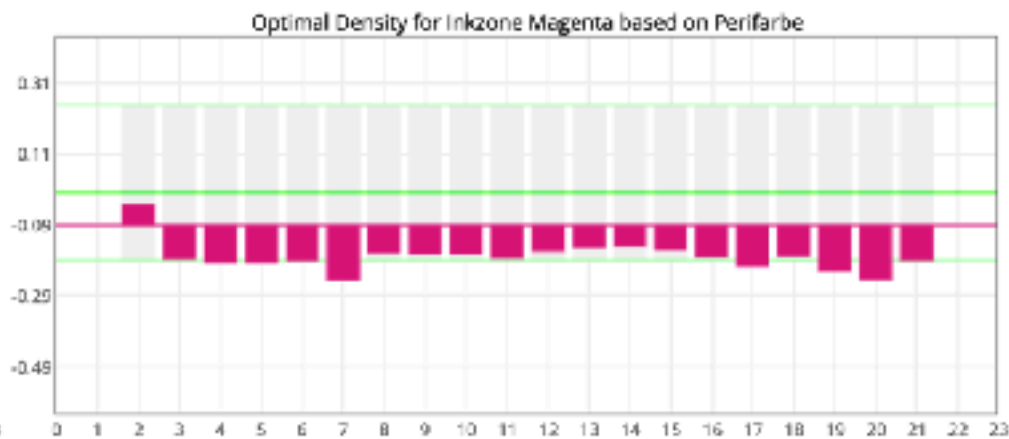
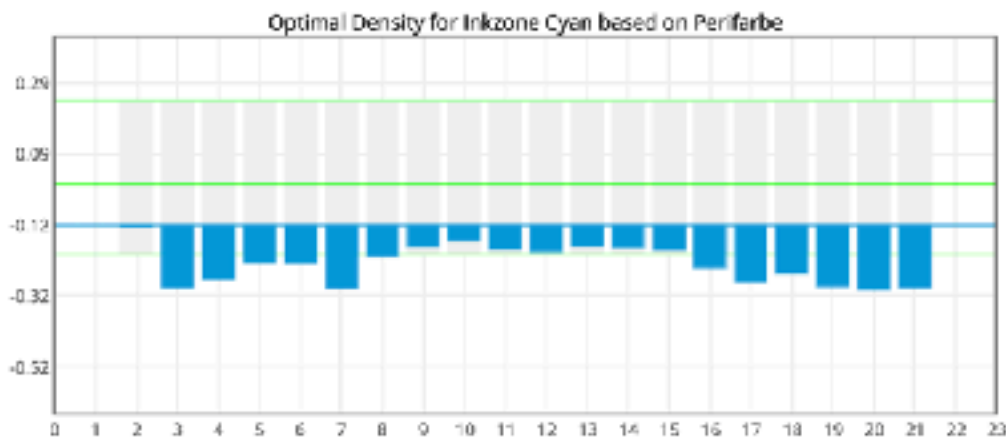
	Name	Created	C	M	Y	K	EF	
<input checked="" type="checkbox"/>	Setter curve 2017-06-07 14:22	2019-05-27 09:48	✓	✓	✓	✓	0.0	🔍
<input type="checkbox"/>	Setter curve 2017-06-07 14:21	2019-05-27 09:48	✓	✓	✓	✓	0.2	🔍
<input type="checkbox"/>	Setter curve 2017-04-20 15:49	2019-05-27 09:48	✓	✗	✓	✓	1.8	🔍
<input type="checkbox"/>	Setter curve 2017-04-20 15:49	2019-05-27 09:48	✓	✗	✓	✓	1.8	🔍
<input type="checkbox"/>	Setter curve 2017-04-20 15:49	2019-05-27 09:48	✓	✗	✓	✓	1.8	🔍
<input type="checkbox"/>	Setter curve 2017-04-20 15:49	2019-05-27 09:48	✓	✗	✓	✓	1.8	🔍
<input type="checkbox"/>	Setter curve 2017-04-20 15:49	2019-05-27 09:48	✓	✗	✓	✓	1.8	🔍

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)

Dashboard All Critical Variables

Eliminate Finger Pointing: Green Icon- Checked

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



The screenshot shows a dashboard for 'MANROLAND' with a table of printing conditions. The table has columns for Track name, Tools, Substrate, Reference Printing Condition, and Details. Each row represents a different printing condition with associated file counts, metrics, and status icons.

Track name	Tools	Substrate	Reference Printing Condition	Details
<input type="checkbox"/> Coated	15 files 4.0	ARC Lith House	1.2	REF: GRACol2019_CRP06
<input type="checkbox"/> PP film	9 files 5.0		3.8	SEGA CGATS21_CRP05
<input type="checkbox"/> Metalized (printed white)	14 files 5.0		4.0	REF: CGATS21_CRP04
<input type="checkbox"/> Uncoated Offset	33 files 6.0		6.1	SEGA GRNCol2019UNC_CRP03

SHOW HIDDEN SETUP ASSIGNMENT

Dashboard All Critical Variables

Eliminate Finger Pointing: Green Icon- Checked

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

Track name	Files	Green Icon	Green Arrow	Value	Tools	Substrate	EF	Green Arrow	Reference Printing Condition	EF	Green Arrow	Details
<input type="checkbox"/> Coated	15 files	Green Icon	Green Arrow	4.0	Tools	ARC 1 (the House)	1.2	Green Arrow	VERA GRACO2019_CRPC6	9.3	Red X	Details
<input type="checkbox"/> PP film	9 files	Green Icon	Green Arrow	5.0	Tools			Green Arrow	SCGA CGATS21_CRPC5	3.8	Green Arrow	Details
<input type="checkbox"/> Metalized (printed white)	14 files	Green Icon	Green Arrow	5.0	Tools			Green Arrow	VERA CGATS21_CRPC4	4.0	Green Arrow	Details
<input type="checkbox"/> Uncoated Offset	33 files	Green Icon	Green Arrow	6.0	Tools			Green Arrow	SCGA GRACO2019UNC_CRPC3	6.1	Green Arrow	Details

SHOW HIDDEN SETUP ASSIGNMENT

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 () 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

Compare Accuracy to Each Other

Compare to each other

◆ We can help with showing the actual  number differences

ChromaChecker®  = **2.6**



Calibrated only Date: _____
 GT Curve only Device: _____
 Color Manager Substrate: _____

Check Your Press/Printer: FREE!
Evaluate accuracy and create GT curves

For step by step instruction scan QRcode visit:
<http://chromachecker.com/free>


↔
= 7.7

ChromaChecker®  = **7.3**



Calibrated only Date: _____
 GT Curve only Device: _____
 Color Manager Substrate: _____

Check Your Press/Printer: FREE!
Evaluate accuracy and create GT curves

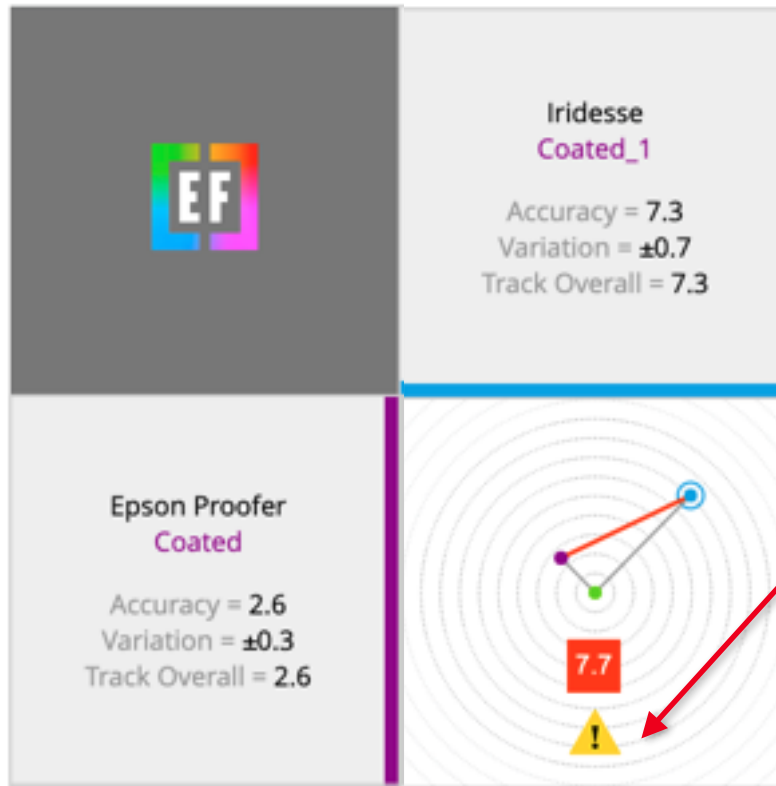
For step by step instruction scan QRcode visit:
<http://chromachecker.com/free>

Compare Printers to Determine Adjustment

Compare how close printers match

- ◆ Align Printers to each other

E-Factor



Warning

Compare Printers to Determine Adjustment

Compare how close printers match

- ◆ Align Printers to each other

E-Factor



Difference between used substrates is greater than 2 ($\Delta E = 6.9$).

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.

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

