

# ColorFlow Workflow Edition Training

## What is ColorFlow?

Kodak ColorFlow is a print process control and color relationship management solution, fully integrated with Kodak Prinergy Workflow.

ColorFlow can manage Tonal Calibration and Color Relationships between all print devices in your environment.

ColorFlow Workflow Edition creates, edits and manages Tonal Calibration Curves.

ColorFlow Pro Edition additionally manages Color Relationships and Ink Optimization.

## ColorFlow Workflow Edition Training

The scope of ColorFlow Workflow Edition training is the creation, editing and management of Tonal Calibration Curves.

- Intro to Process Control and Industry Standards
- ColorFlow User Interface
- Creating and managing Plate Curves
- Creating and managing Print Curves
- Measuring a printed Characterization chart
- Choosing a Print Reference Target

## What is Print Process Control?

- Ability to control amount of ink printed for each color, at each tonal
- Necessary for consistent, predictable results that will satisfy customers
- Must control each step of the process
  - Platemaking (Plate Curves)
  - Press (Print Curves)

## Steps of Process Control

- Confirm you have a stable print condition
- Print a test target
- Measure the test target
- Choose a desired quality target (*"Reference Device Condition"*)
- Create Calibration curves to match the quality target

## Process Control Terminology

- **Linear:** printed value same as electronic file value (input = output)
- **Dot Gain:** Printed material becomes darker than intended
  - Gain is natural and expected
  - **Physical gain:** ink spread increases halftone dot size on substrate
  - **Optical gain:** light scattering in substrate makes halftone dots absorb light and appear larger
- **TVI:** Tone Value Increase (TVI)
  - Measured amount halftone dots increase in size, due to gain
  - Measured as an absolute percentage based on 100%
    - *a printed 50% dot with a TVI of 15% measures 65%*
- **Plate Curve:** used to adjust plate imaging so plate is accurate *"linear"*
- **Print Curve:** used to adjust print results to match a desired target

## Dot Gain is Expected and Desirable

- Printed results not expected to be linear, in fact, look like bad quality if linear
- Target print responses are based on desired gain
  - Typically between about 68-72%
- Gain just needs to be controlled

## Factors affecting Dot Gain

- All print factors together create a unique "Device Condition", that must be managed with a unique set of Tonal Calibration Curves
  - Press (offset, letterpress, flexo, screenprinting, etc.)
  - Plate (offset, thermal, UV, flexo, etc.)
  - Substrate (paper, poly, coated, uncoated, calendered, etc.)
  - Inks used (chroma, densities, viscosities, grind, etc.)
  - Other (drying, curing, press speed)
  - Halftone dots (round, euclidean, line, stochastic, etc.)

## Target Print Response

- **"How you want your device to print"**
  - **Shop standard:** based on legacy information or internal specs (*"the numbers from our old RIP"* or *"the pressman told me to take 3% out of the Magenta"*)
  - **Industry standard:** an agreed-upon colorspace description that acts as a reference for accurate color reproduction across different devices and applications
    - **SWOP** (Web offset)
    - **GRACoL** (Commercial Offset Lithography)
    - **FOGRA** (European)
    - **ISO**
    - **Others...** (IFRA, SNAP, JNC, JCW...)

## Managing Gray Balance

- Relatively equal amounts of C, M and Y produce gray
- Eye sensitive to gray casts (reddish, bluish, yellowish)
- If you can control appearance of gray patches, other colors fall into place
- Must manage tonality with gray balance in mind
  - "Make it lighter" means removing different amounts of C, M and Y
- This method used by G7 in modern GRACoL and SWOP standards
  - ColorFlow has native support for G7 P2P25 charts

## Special Print Conditions and Curves

- Some print processes (eg. flexo) have limited highlight resolution
  - Cannot print small highlight dots
  - Cannot print smooth gradients starting from white
  - Highlights have excessive gain
    - Lightest dots may measure 10% or more...
  - Called a "discontinuous" print response

- In ColorFlow, use a *Flexographic Device* for discontinuous print conditions

## **BREAK – 15 minutes**

### **ColorFlow Versions**

- **ColorFlow Workflow Edition**
  - Print Condition Characterization
  - Process Control using Tonal Calibration Curves
  - Reporting
- **ColorFlow Pro Edition**
  - Print Condition Characterization
  - Process Control using Tonal Calibration Curves
  - Color Relationship Management (CRM)
    - ICC Device Profiles
    - ICC DeviceLink Profiles
  - Comprehensive Reporting
  - Ink Optimization Solution (Option)

### **Additional ColorFlow Capabilities**

- If time allows, will introduce ColorFlow Pro Edition added capabilities at end of training
  - **Color Relationship Management (CRM)**
    - ColorSetups manage color across all devices in your shop
    - ICC Separation Profiles and ICC DeviceLink Profiles
    - Comprehensive Print Condition and Verification Reports
    - ColorSetups automate CRM within Prinergy: "automatic color"

### **ColorFlow Workflow Edition**

- Creating and managing Calibration Curves for plate and print process control
- Does not involve color relationship management or ink optimization
- User Interface: *Workflow edition only uses the two Curves tabs on left*
  - Plate Curves
  - Print Curves

### **Plate Curves Tab**

- Plate Curves
  - Quick intro to UI
    - Calibration Curves, Data entry pane (official name?), Harmony Curves (for legacy curves import, but recommended to create new plate curves from scratch.)
- Demo: Create a Calibration Curve

### **Print Curves Tab**

- Print Curves
  - Quick intro to UI
    - Calibration Curves, Transfer Curves, Data entry pane (official name?), Harmony Curves (for legacy curves import, but recommended to create new print curves from scratch.)
- *Demo:* Create a Print Calibration Curve

- *Demo*: Create a Print Transfer Curve
  - Ink Optimizing Solutions

## Reports

- Curve Reporting (what can we say about this?)

## ColorFlow Workflow Edition – Learning Activity 1

- [Activity 1: Use a plate curve to linearize a plate](#)

## ColorFlow Workflow Edition – Learning Activity 2

- [Activity 2: Use a transfer curve to control tonal response](#)

## ColorFlow Workflow Edition – Learning Activity 3 (For flexo customers)

- [Activity 3: Use a transfer curve to control Flexographic print response](#)

## ColorFlow Workflow Edition – Learning Activity 4

- [Activity 4: Use a print curve to align a press with an industry specification for tonal match](#)

## ColorFlow Workflow Edition – Learning Activity 5

- [Activity 14: Use a print curve to align a press with a custom specification for tonal match](#)

## ColorFlow Workflow Edition – Learning Activity 6

- [Activity 6: Use a print curve to align a press with an industry specification for gray balance](#)

## ColorFlow Workflow Edition – Learning Activity 7

- [Activity 7: Add a spot ink to a print calibration curve](#)

## ColorFlow Workflow Edition – Learning Activity 8

- [Activity 8: Use Verification reports to verify color response with a print curve](#)

## End of Training (optional): additional ColorFlow capabilities

- If interested and time allows, can discuss additional capabilities of ColorFlow Pro Edition
  - Color Relationship Management (CRM)

- ColorSetups manage color across all devices in your shop
- ICC Separation Profiles and ICC DeviceLink Profiles
- ColorSetups automate CRM within Prinergy: "automatic color"
- Ink Optimizing Solutions