

## Morning Session

### Session Start

- Introductions
  - Instructor intro
  - Attendee introductions
    - Why are you here?
    - What do you hope to learn?
    - Do you have any special needs?
  
- Housekeeping
  - Using the syllabus as a guide
  - Rules for interruptions (cell phones verboten)
  - How to use the handouts and presentation materials
  - Note taking - - there will be a test at the day's conclusion
  
- Review Course Objectives
  - Course goals
  - Overview of the day

### Color

- Understanding Color
  - Components of Color
    - Light
    - Object
    - Receiver
  - Color theories
    - Additive
    - Subtractive

## Densitometry Basics

- Important considerations
  - Status Response
  - Calibration

## Hands-on Exercise - Instrument Calibration

- What are the Keys?
  - Up
  - Down
  - Exit
  - Previous
  - Enter
  
- What's in the display?
  - Heading
  - Functions
  - Getting to the Main menu
  
- Calibration Procedure
  - Accessing the calibration menu
  - Verifying the reference serial number
  - Cleaning the reference
  - Performing the calibration

## Densitometric Functions - Density

- Density
  - What is Density?
  - Why do we measure Density?
  - Where should Density be measured?
  - What do the numbers mean?
  - What numbers should we aim for?

### Hands-on Exercise – Measuring Density

- Density Measurement
  - Accessing the density function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

### Densitometric Functions – Print Contrast

- Print Contrast
  - What is Print Contrast?
  - Why do we measure Print Contrast?
  - Where should Print Contrast be measured?
  - What do the numbers mean?
  - What numbers should we aim for?

### Hands-on Exercise – Measuring Print Contrast

- Print Contrast Measurement
  - Accessing the Print Contrast function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

### Densitometric Functions – Dot Area/Dot Gain

- Dot Area/Dot Gain (Tone Value/Tone Value Increase)
  - What is Dot Area?
  - What is Dot Gain?
  - What are Tone Value/Tone Value Increase?
  - Why do we measure Dot Area/Dot Gain?
  - Where should Dot Area/Dot Gain be measured?
  - What do the numbers mean?
  - What numbers should we aim for?

Related Topics

- Mechanical vs. optical dot gain
- Yule-Nielson equation (N-Factor)
- Reading Plates

## Hands-on Exercise – Measuring Dot Area/Dot Gain

Dot Area/Dot Gain Measurement

- Accessing the Dot Area/Dot Gain function
- Verify the proper instrument configuration
- Take measurements of sales tool
- Verify results

## Densitometric Functions – Hue Error/Grayness

Hue Error/Grayness

- What is Hue Error/Grayness?
- Why do we measure Hue Error/Grayness?
- Where should Hue Error/Grayness be measured?
- What do the numbers mean?
- What numbers should we aim for?

## Hands-on Exercise – Measuring Hue Error/Grayness

Hue Error/Grayness Measurement

- Accessing the Hue Error/Grayness function
- Verify the proper instrument configuration
- Take measurements of sales tool
- Verify results

## Densitometric Functions – Ink Trap

- Ink Trap
  - What is Ink Trap?
  - Why do we measure Ink Trap?
  - Where should Ink Trap be measured?
  - What do the numbers mean?
  - What numbers should we aim for?

## Hands-on Exercise – Measuring Ink Trap

- Ink Trap Measurement
  - Accessing the Ink Trap function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results
- Questions and Answers

**Lunch on your own**

**Class Reconvenes In One Hour!**

## Afternoon Session

### Pressroom Color Control

- The trouble with color
  - Color reproduction
  - Color Subjectivity
  - Color Communication

### Specifying Color

- Albert Munsell
  - Munsell's Background
  - Munsell's color notation scheme
    - Hue
    - Value
    - Chroma
- Richard Hunter
  - Rescaling the map
  - Hunter Lab
  - Delta E
- CIE L\*a\*b\*

### Hands-on Exercise – Measuring L\*a\*b\*

- L\*a\*b\* Color Measurement
  - Accessing the Color function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

**L\*a\*b\* vs. L\*C\*h°**

- L\*C\*h°
  - Conversion from L\*a\*b\*
  - Plots on the same map

**Hands-on Exercise – Measuring L\*C\*h°**

- L\*C\*h° Color Measurement
  - Accessing the Color function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

**Color Tolerancing**

- Tolerancing in L\*a\*b\*
  - L\*a\*b\* Tolerance
  - $\Delta E$  L\*a\*b\* Tolerance
  - Accessing

**Hands-on Exercise – Measuring  $\Delta E$  L\*a\*b\***

- $\Delta E$  L\*a\*b\* Tolerance Measurement
  - Accessing the Color difference function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

**Color Tolerancing**

- Tolerancing in L\*C\*h°
  - L\*C\*h° Tolerance
  - How does this differ from L\*a\*b\* Tolerance

- Tolerancing in  $\Delta E$  CMC
  - How does this differ from  $L^*a^*b^*$ ,  $\Delta E L^*a^*b^*$ , and  $L^*C^*h^\circ$  Tolerance
  - Advantages to  $\Delta E$  CMC

### Hands-on Exercise – Measuring DE CMC

- $\Delta E$  CMC Tolerance Measurement
  - Accessing the Color difference function
  - Verify the proper instrument configuration
  - Take measurements of sales tool
  - Verify results

### Instrument Types

- Densitometers
  - How do they work
  - Uses
  - Advantages/Disadvantages
- Colorimeters
  - How do they work
  - Uses
  - Advantages/Disadvantages
- Spectrophotometers/SpectroDensitometers
  - How do they work
  - Uses
  - Advantages/Disadvantages



## Limitations of the human visual system

- Retinal fatigue
  - Explanation of this deficiency
  - Illustrations on screen
  
- Poor Color Memory
  - Explanation of this deficiency
  - Illustrations on screen
  
- Background Effects
  - Explanation of this deficiency
  - Illustrations on screen
  
- Color Deficiencies (Blindness)
  - Explanation of this deficiency
  - Illustrations on screen
  
- Effects of lighting conditions
  - Explanation of this deficiency
  
- Recordability
  - Explanation of this deficiency
  
- Effect of age
  - Explanation of this deficiency

## Questions and Answers

## Where to look for further information

### Getting HELP from X-Rite

- Use the web:  
<http://www.xrite.com/contact/ContactUs.asp>
- Send E-Mail to:  
<mailto:GISupport@xrite.com>
- Try the Bulletin Board:  
<http://www.xrite.com/helpdesk/bulletinboard.asp>
- Contact Customer Service by phone:  
[888-826-3042 \(US & Canada only\)](tel:888-826-3042)

Send a Fax to:

[616-534-0723](tel:616-534-0723)