

# “Managing the Printed Color from Cradle to Grave”

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**Color Research Lab**



# Color Research Lab at Sun Chemical

- SmartColour
  - Global Shade Libraries, iVue, Ink Formulation System, Digital Ink Standards, SmartColour training and certification
- R&D Lab support
  - Liquid inks lab, EC ink lab, Analytical lab, Electronics Product, Color Theory training
- International Standards Committees



# Sun Chemical at Standards Meetings

- ISO  
ISO 12647 & ISO 2846
- CGATS and IDEAlliance Print Properties
- GRACoL/G7
- CIE - International Commission on Illumination
- ICC - International Color Consortium

# Overview

**The right way to capture, communicate and maintain the color concepts!**

- Sun Chemical's gravure ink systems for different applications
- Sun Chemical's role in the printing business
- SmartColour and Global Shade Libraries for process and spot color printing
- Ink Formulation System and its link to the Global Shade Libraries
- SmartColour iVue software as the tool for consistent management of spot color communication from the prepress to press

# Gravure Ink Systems

## SunStrato™ SB Sunester™ NA

- A flexographic and gravure ink system that is nitrocellulose blendable for use on chemical-and corona-treated polyester films. In addition, SB Sunester inks may be modified for use on most treated polyolefin films.



## SunSpectro™ SB Harmony™ NA

- A solvent-based ink system formulated for gravure printing on PVC, PET-G and OPS shrink films. Substrates printed with Harmony inks may be converted into sleeves for shrink applications on pre-packaged items such as beverages, tobacco and milk-based products.



# Gravure Ink Systems (cont'd)

## Aquasun® LC NA

- A packaging ink system designed for varnishable applications or applications with low product resistance. These inks boast excellent resoluability properties and can be printed on coated and uncoated paper, paperboard and primed foils.



## AquaSun® III NA

- An alkali-resistant gravure ink system known for its superior adhesion to paper, linerboard, polycoated board and coated and uncoated foils.



# Gravure Ink Systems (cont'd)

## Publication Gravure EU

- A robust offering of publication gravure inks designed for new-generation presses. This series includes conventional, matte, specialty extenders and low solvent retention inks. Fine-tuned for all rotogravure paper grades, they deliver consistency, reliability and flexibility.



# How do we work with color? Variables involved....

## Steps of Image Creation:

- Design firms establish color targets
- Color Separators prepare Master's
- Substrates have variation in film and paper
- Printing ink has variation from pigment and additives suppliers
- Image carriers have variation from actual plate/cylinder materials and exposure/engraving processes
- Printing process have defects



# Graphic Reproduction

## Prepress workflow:

- color separation of artwork
- screen rulings, screen angles
- UCR, GCR, grey balance
- film, digital imaging - CTP, camera, scanner
- print specifications

# Substrate

## Physical and chemical characteristics of the substrate:

- Grammage, thickness, size
- brightness, whiteness, opacity, color, gloss
- absorption (ink, water), moisture content, solvent resistance
- surface smoothness, surface strength, surface energy, porosity
- tensile strength, compressibility, elasticity
- coating composition

# Ink

## Physical and chemical characteristics of the ink:

- pigmentation, hue, color strength, transparency & opacity
- dispersion, viscosity flow, gloss, rate of drying
- color sequence (multi-color printing), overprinting/coating receptability, balanced process inks (hue error, grayness)
- chemical composition-chemical resistance, rub & scuff resistance, solvent balance
- ink film thickness, surface tension
- ink feed, temperature

# Cylinders/Sleeves

## Cylinder/Sleeves characteristics:

- screen, angles, engraving
- image area surface, non-image area surface
- ink receptivity, dot gain/loss
- exposure/processing, chemistry, handling
- cylinder design, cylinder width

# Printing Process

## Press characteristics:

- press engineering/design, mechanical condition
- number of stations, ink delivery system, doctor blade system
- printing speed
- temperature/humidity - pressroom, press, surfaces
- color sequence, press fingerprinting

# 100,000s COMBINATIONS !!!

## Sun Chemical's Role in the Industry Qualification, Verification & Certification

- Printing ink qualification
- Verification occurs at the printers through the application process
- Final approval results in the ink formula certification finalization with agreed upon tolerances that meet or exceed customers' specifications
- Consistent supply against the ink formula certification and change management is employed moving forward

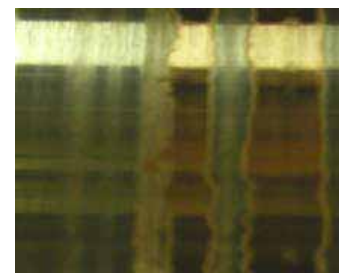
# Defects - Gravure Printing Process

**ABRASION - Unusual cylinder wear visible on cylinder or in print.**

## PROBLEM

## SOLUTION

- |   |  |
|---|--|
| 1. Pigment is unground.                           | 1. Grind pigment.                                      |
| 2. Pigment choice is incorrect.                   | 2. Select different pigment.                           |
| 3. Solvent is drying too fast causing a dry wipe. | 3. Balance solvent blend.                              |
| 4. Chrome is poor on cylinder.                    | 4. Rechrome cylinder.                                  |
| 5. Cylinder design is inappropriate.              | 5. Change to proper cylinder design.                   |
| 6. Blade is not oscillating.                      | 6. Adjust blade.                                       |
| 7. Blade pressure is excessive.                   | 7. Decrease blade pressure.                            |
| 8. Contaminant is present in ink.                 | 8. Decontaminate ink through filtration or remake ink. |
| 9. Doctor blade is nicked or warped.              | 9. Change doctor blade.                                |



# Defects - Gravure Printing Process

**BLEED** - There is a visible tint or stain of the color on the printed substrate or one color bleeds into another.



**BLISTERING** - Small bubble-like areas on the surface of the printed ink or overprint varnish.



**BLOCKING/OFFSET** - Undesired adhesion between surfaces. Ink is sticking to reverse side of print when rewound or bundled.



**BRITTLENESS** - Ink surface or substrate fractures and breaks when flexed or bent.



**COMETS/DARTS** - Intermittent, small streaks of ink in the shapes of comets and darts extending away from the print edges. Sometimes referred to as soft streaking or "shooter streaks".





# Defects - Gravure Printing Process

**DRAG-OUT** - A bead of excessive ink that appears at trailing edge of print.



**DRYING-IN** - Ink is printing weak in spots and/or printing in a screen pattern.



**FOAMING** - Small or large bubbles appear in the ink. Circular voids with a dark perimeter appear in the print.



**PICKING** - Noticeable, imperfect areas of print with no ink. Ink may transfer to idler rolls.

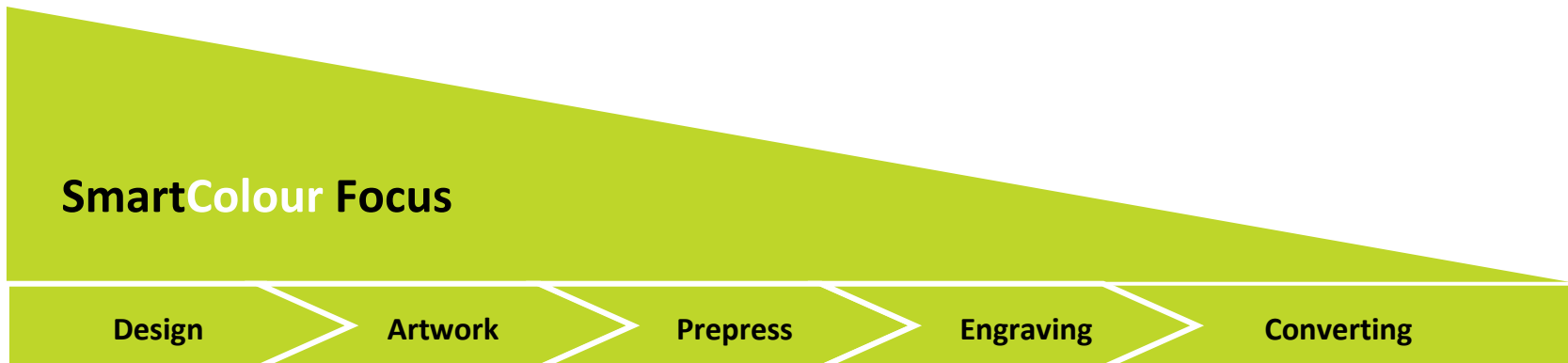


**RAILROAD TRACKS** - Continuous, usually parallel, lines extending in the unprinted and printed areas. May move with oscillation of doctor blade.



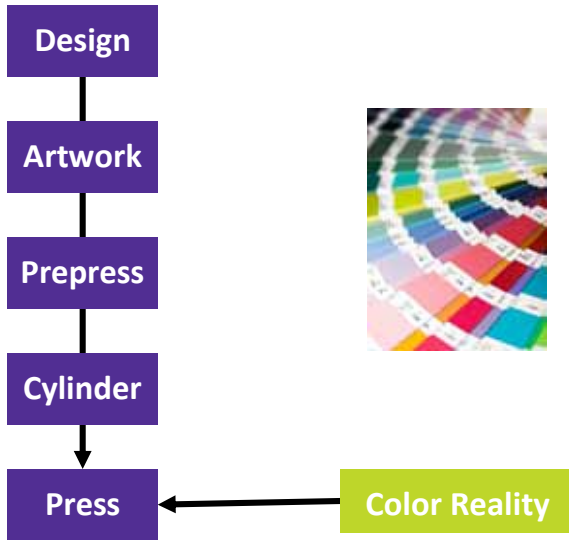
# Introducing SmartColour™ from Sun Chemical

- A new Sun Chemical business unit dedicated to the global consistency of brand colors
- Creates true brand color guidelines for various printing processes on different substrates
- Simplifies and saves time for everyone in the design workflow

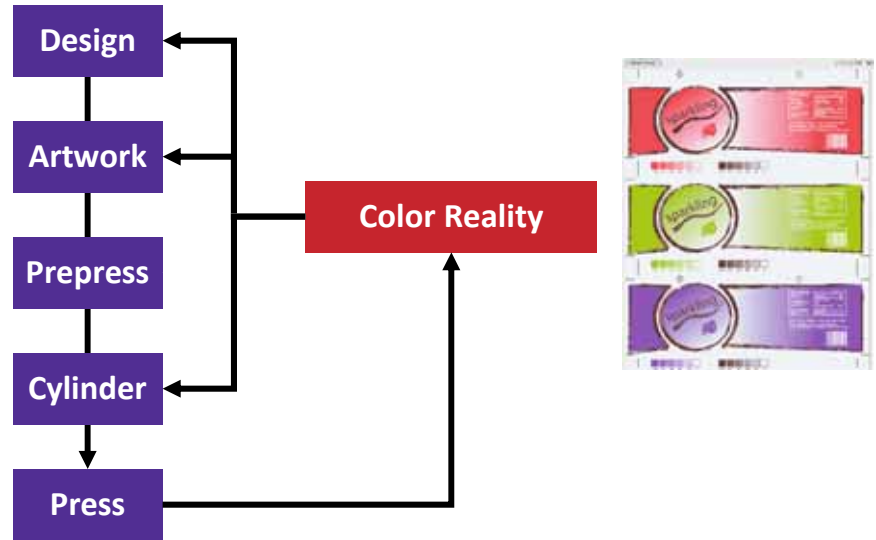


# SmartColour Implementation

## Conventional Workflow

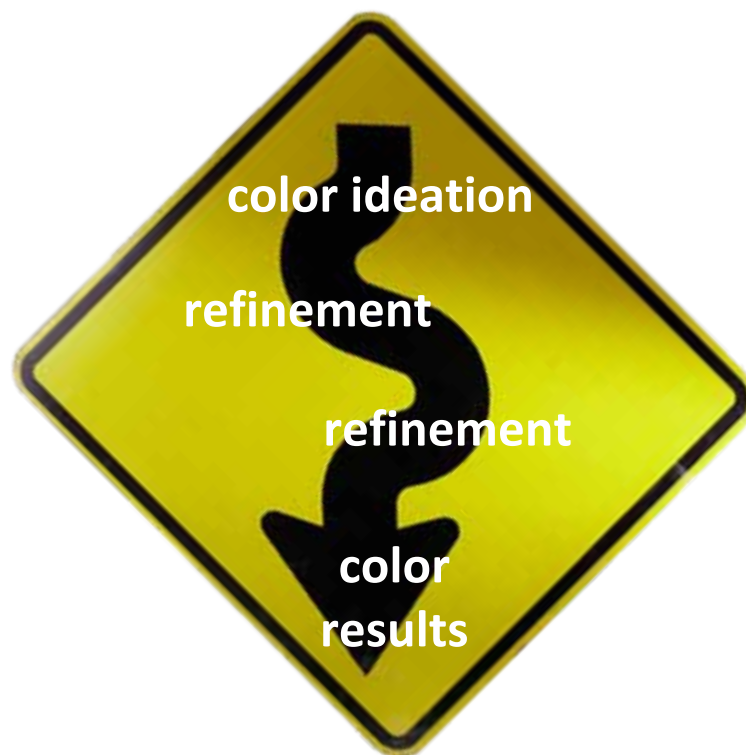


## SmartColour Workflow



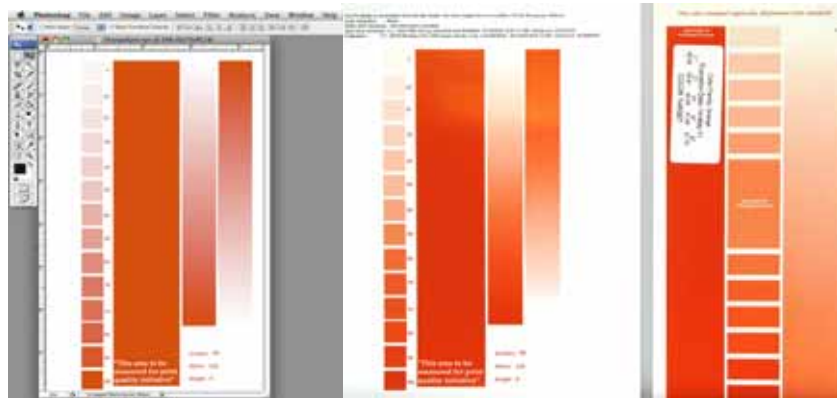
- Simplifies and saves time for everyone in the design workflow

# Implementation framework



# Brand Color Management (Ink Standardization Program)

- Physical Color Standards to communicate color at every stage
- Increase speed to market by having a fully pre-developed color library
- Provide support & consultation for the qualification
- Create and distribute ink standards & Maintain ink standard libraries
- Color matching across print technologies & various structures



# SmartColour Process

## Organize:

Find your optimal brand color with help from SmartColour Consulting™ experts.

## Standardize:

Ensure brand colors print accurately on real substrates by utilizing SmartColour Standards™.

## Digitize:

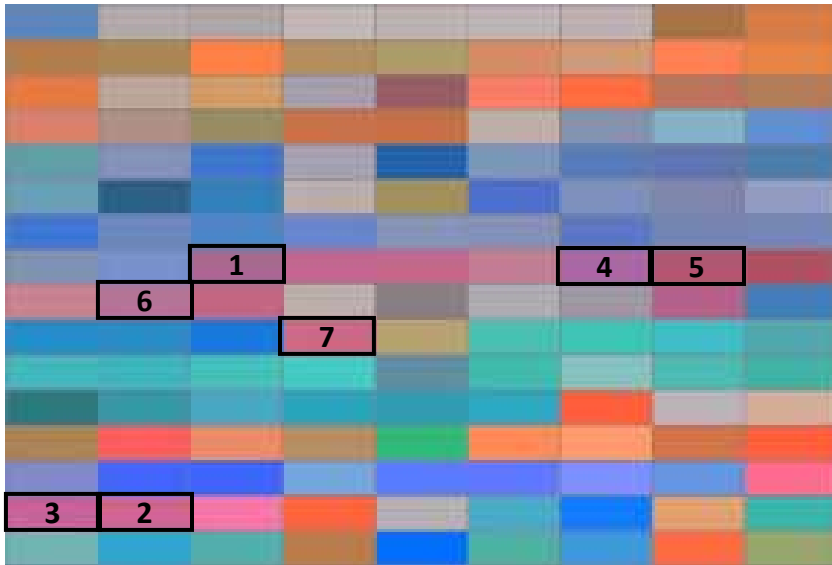
Increase speed to market for your brand with our proprietary, customizable and secure digital tools.



# Organize

- With a SmartColour approach, one can consolidate a palette and determine an optimal true brand color for accurate printability across a variety of substrates.

A. Start with existing brand color palette



B. Select similar brand colors

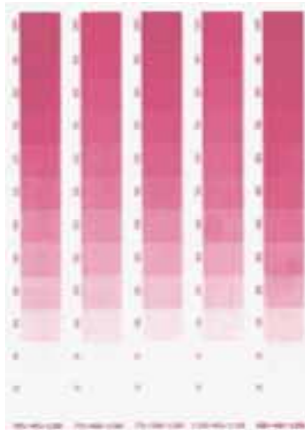


C. Determine a new optimal color



# Standardize

- Standardization of true brand colors establishes a working color palette to ensure print accuracy on real substrates, leading consistency from design to pre-media to press.



MEASUREMENT INFORMATION	
INSTRUMENT:	Sphere D8 <sup>9</sup> , Specular Excl.
ILLUMINANT:	Primary: D50 Second: F2
APERTURE:	8mm
TOLERANCE:	1.0 DE <sub>CMC 2:1</sub>
L*:	83.70
C*:	80.7
H*:	11.5



A. Establish guidelines for each color, including print methods, inks and substrates

B. Create a database containing instructions for the use of each color

C. Assemble and distribute final color standards

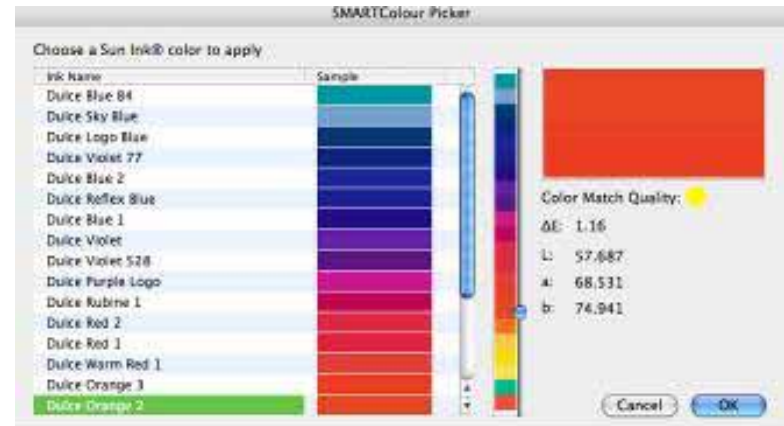


# Digitize

Achieve speed to market efficiencies by using our proprietary digital tools to determine how brand colors will appear on-shelf.

## A. SmartColour DigiBase

- Digital color database that is brand specific
- Packaging relevant
- Secure



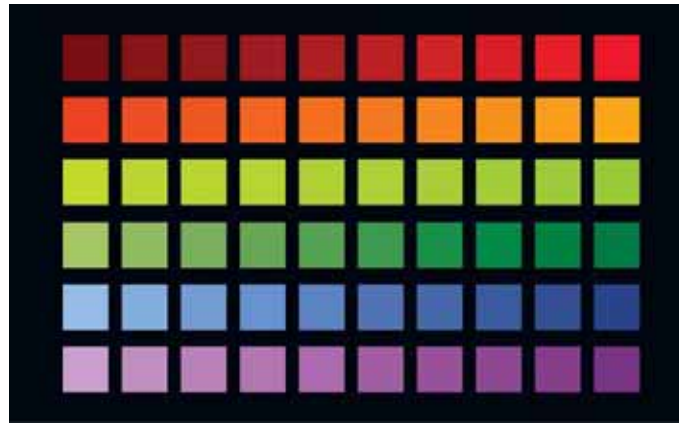
## B. SmartColour iVue™

- Access “real” colors via Adobe Creative Suite
- Render and proof your designs as they will appear on shelf



# SmartColour™ Global Shade Library Services

- SmartColour™ iVue was first introduced to the prepress and design markets to allow brand owners and designers the ability to predict how their brand spot colors will reproduce on a wide variety of print processes and substrates.
- Now with SmartColour™ IFS Link to Global Shade Library, commercial printers will have access to Sun Chemical's database of more than 200,000 color formulations of real ink colors for the print marketplace to increase both their speed to and accuracy of ink color.



# SmartColour Value to Printer

## Faster press make-ready

- Increase efficiency and profitability
- Can handle smaller runs
- More jobs can be run

## Color right first time

- Real color has been pre-approved
- No surprise/No rework
- Delighted Customer, develop trust in printing execution

## Save Cost

- Save time, money and labor
- Less material waste
- Less review meetings and travel



# SmartColour™ iVue



SmartColour™ iVue is an innovative color management system that allows anyone in the packaging design workflow to view predicted spot color at every stage of the process.

Real color. With real ink. On real substrates. Using real print processes.

The same color whether it's on the screen. On a proof. Or on a shelf. Anywhere in the world.

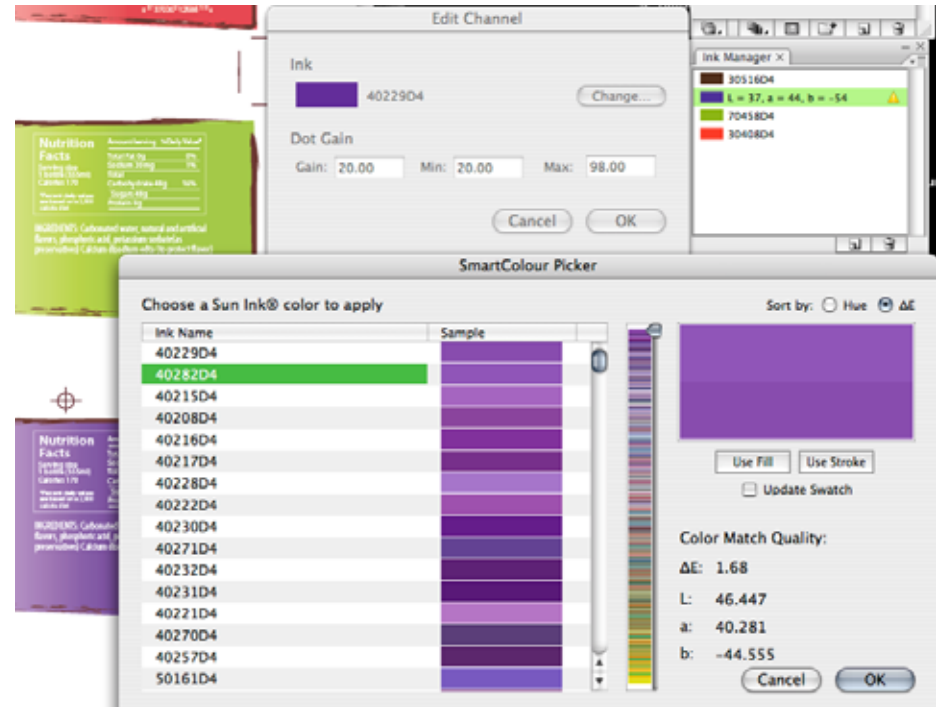
# SmartColour™ iVue Libraries

- iVue accesses the SmartColour Engine - large database of color-on-structure libraries
- The engine contains over 300,000 color identities, classified by print process and substrate
- Libraries are secured requiring user login credentials, assuring security of any brand-specific color libraries
- Exploration of color results via multiple print processes or substrates can be achieved in a few minutes without having to generate a press run



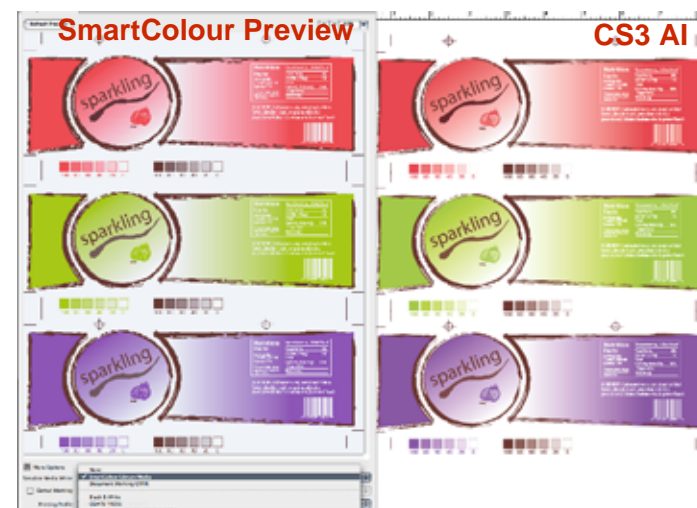
# SmartColour™ iVue Libraries

- iVue includes the SmartColour extensible color picker
- Brand-specific libraries can include customized names for each color identity
- Libraries all contain colors from common substrates and print parameters allowing selection among those colors that can be achieved on press and delivered at the store shelf



# SmartColour™ iVue Preview Feature

- Accurate previewing is a key feature of iVue and helps to prevent mismatches at press due to inaccurate brand color predictions throughout the workflow.
- Note the accurate rendering of the light blue background color which will print dirty using the selected ink/printing process and the substrate color which is less bright and slightly creamy.
- In the bottom image, the spot colors are rendered realistically throughout the tone scale, including dot gain and substrate color.

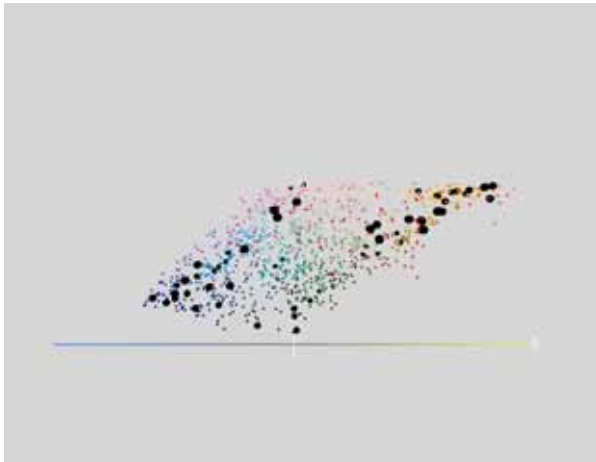


# SmartColour™ iVue Proofing Feature

- Results can be printed either to local or network printers, and accurate results are shown provided the print path is color managed.



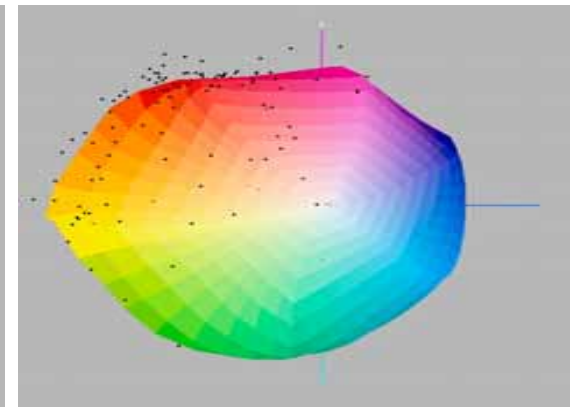
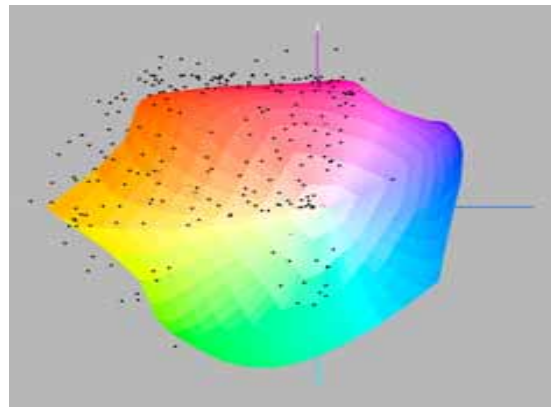
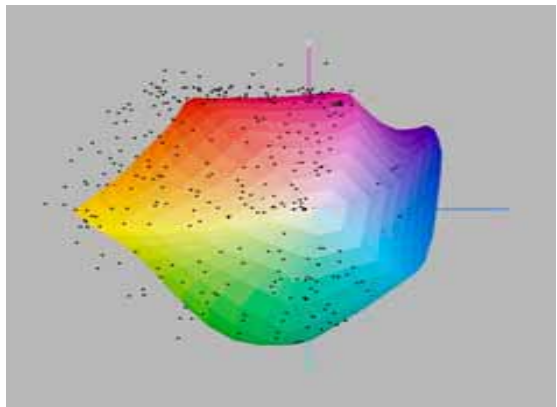
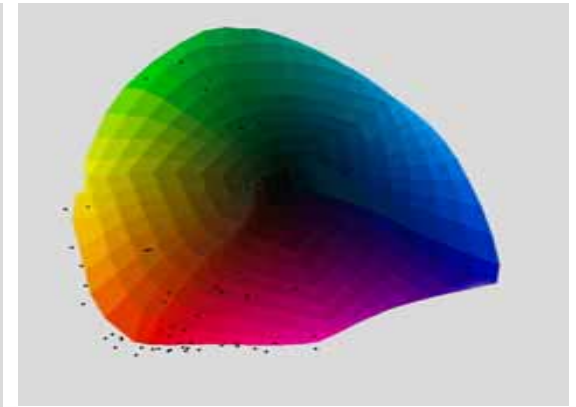
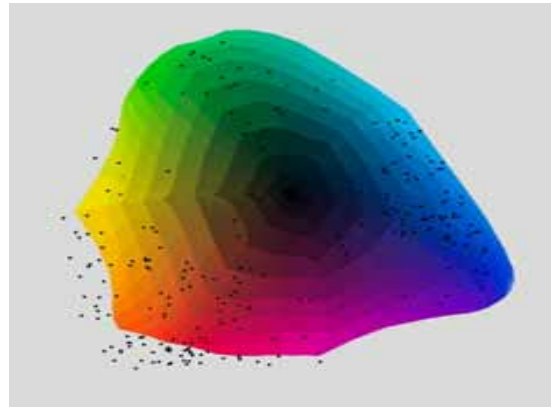
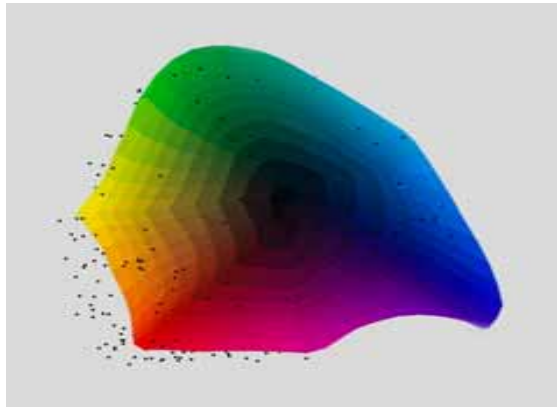
- Color space of each proofer is evaluated and mapped for the iVue compatible colors.





# CPG Color Set vs. Printers

Pigment based ink jet printers

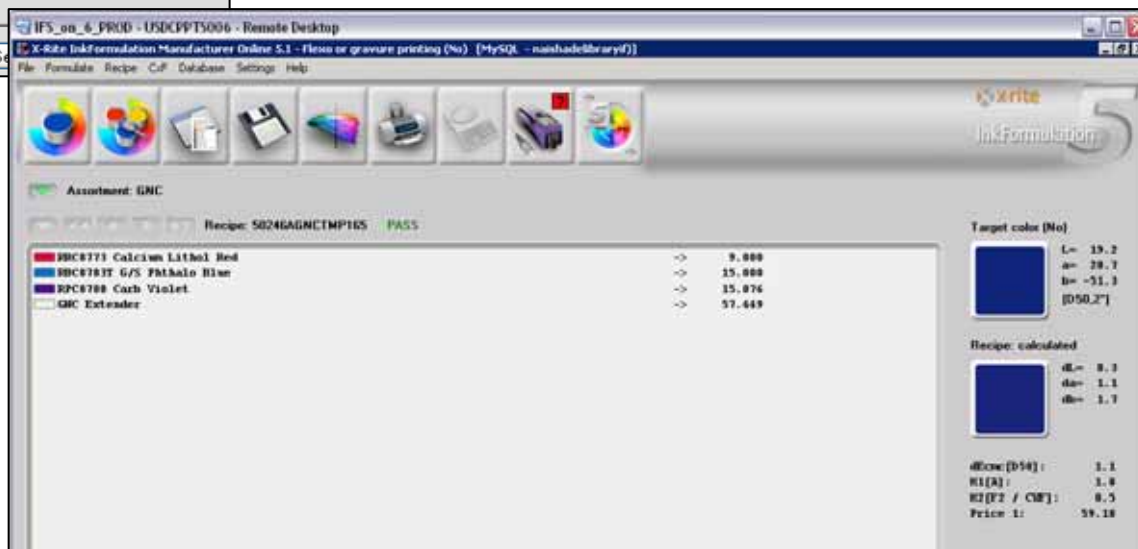
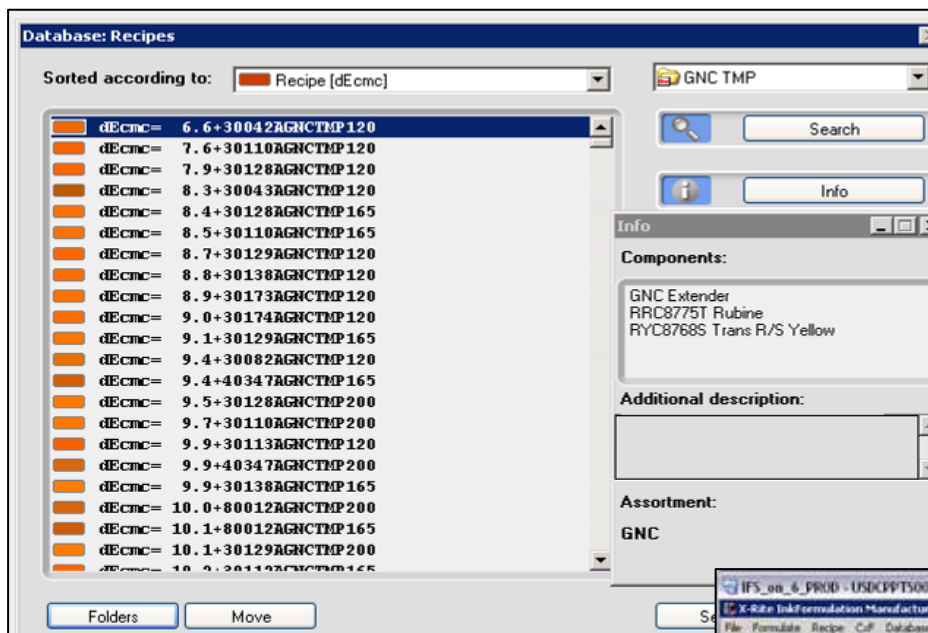


Canon iPF5000

HP Z3100

Epson Pro 7900

# X-Rite Ink Formulation System Solution - IFS 5



**SmartColour™ iVue Presentation  
IFS 5 Presentation**

**Discussion**

<http://members.whattheythink.com/video/view.cfm?id=34898>

## Contact:

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