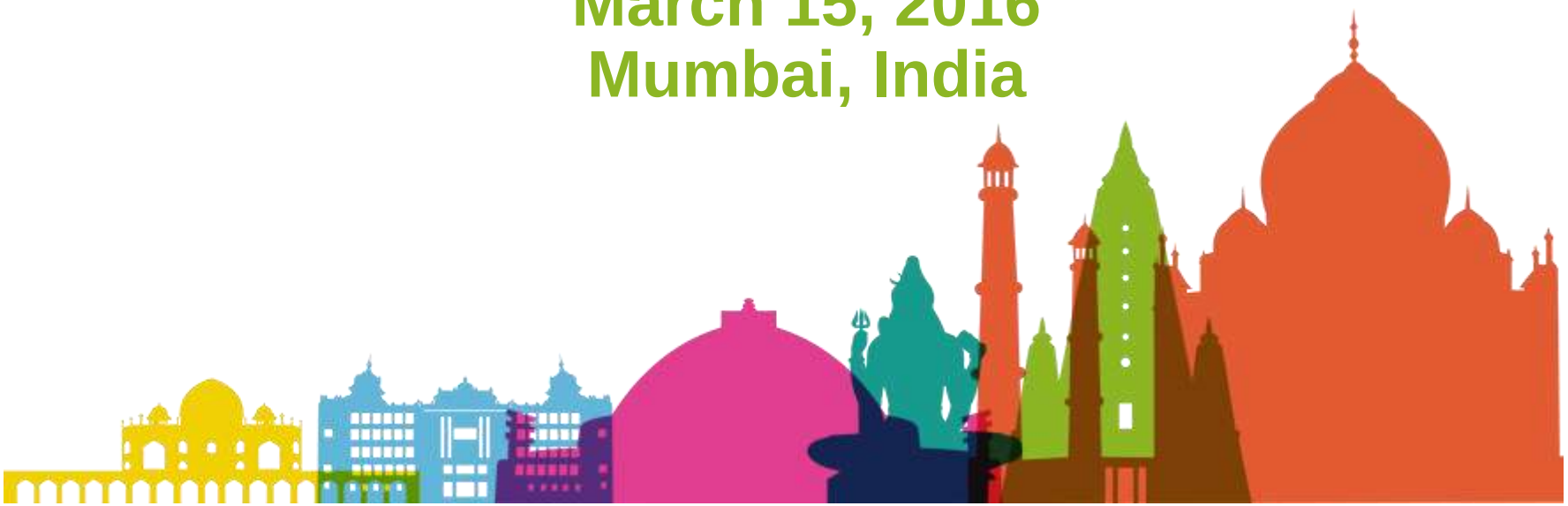
CREATING FUTURE PRINT THROUGH TECHNOLOGY AND INNOVATION

PRINT BUSINESS OUTLOOK CONFERENCE 2016

March 15, 2016
Mumbai, India



Managing Special Colours

By: Steve Smiley

SmileyColor & Associates

Agenda

- Brand Owners Requirements
- ISO Standards
- CxF/X Workflow
- ISO 20654 - Spot Colour Tone Value (SCHMOO)
- ICC Max

All components are the display

Consistency Implies Quality Product Inconsistency raises Questions

Great Packaging delivers a promise about the brand!

"We care about our product"

According to Published Articles

- The average supermarket shopper is exposed to 42,000 products in a shopping visit lasting 30 minutes
- 60% are impulse purchases
- 80% of purchasing decisions are made in the store
- The decision whether to pick up the package or not is made in less than 2.6 seconds

Packaging Research - Evaluating Consumer Reaction - Elliot C. Young
How to Tell If Your Packaging Will Sell Your Product - JoAnn Hines

What we do not want our consumers see our brands at retail:

ISO 15930

- PDF/X -4– Portable document exchage
  - 1.6 Blind Exchange (1.7 keeps Adobe Illustrator file)
- Providing all the necessary information in the PDF/X Embedds
  - Fonts
  - Images
  - Color (Both CMYK and Spot colour)
    - Output Intent ICC profile (Customers Expectation)
    - CxF/X-4 Spot Colour Definitions – Mixing Hints

ISO 15339 - Color Exchange Principles and aim datasets

CMYK Workflow

- ANSI CGATS 21 CRPC 1-7.icc, ISO 15339 – www.color.org/registry
- 7 Reference Print Conditions

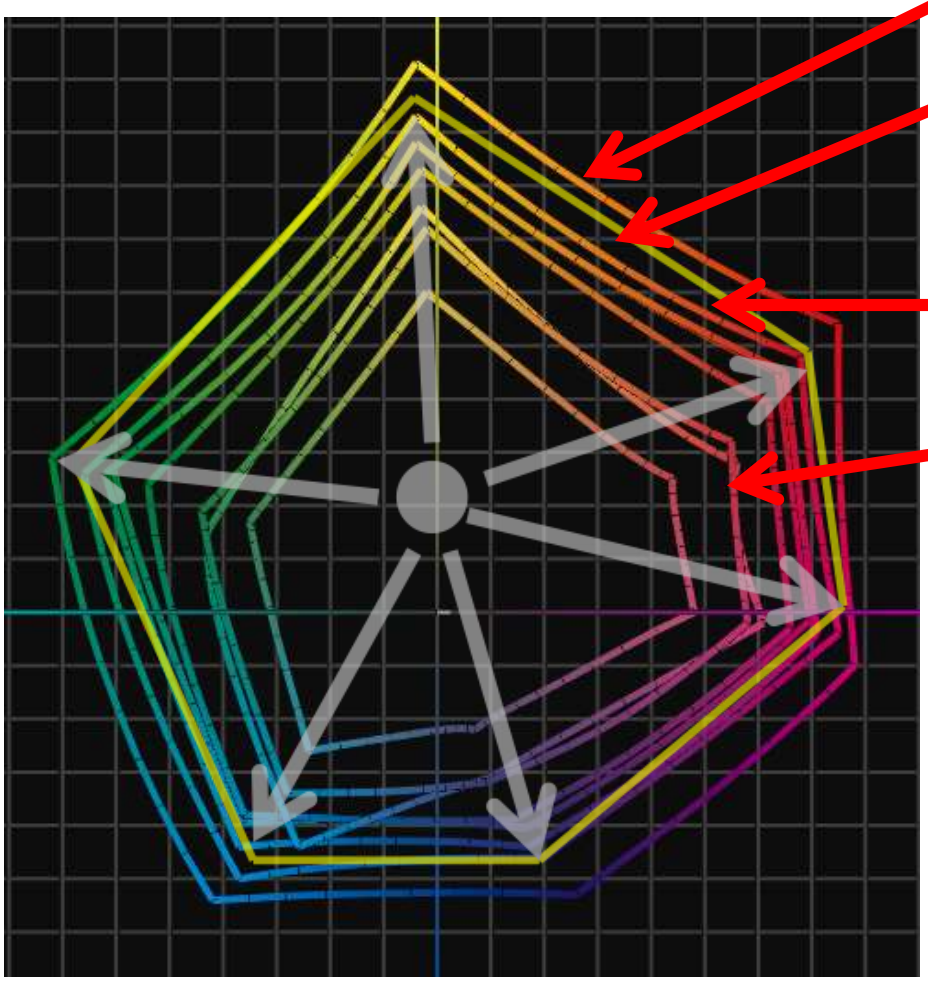
CRPC1 CRPC2 CRPC3 CRPC4 CRPC5 CRPC6 CRPC7

Flexo Cotton Top Flexo uncoated

Wide Web Flexo Corrungated Coated

Narrow Web Flexo Flexo New Plate

Brand Equity: Tying this all together



Flexo New Plate Technology

Flexo Narrow Web CRPC6

Wide Web Flexo CRPC5/6
Corrugated Flexo

Corrugated Cotton Top

All CMYK Devices Can Have a Similar Neutral Value

ISO 17972 Series

- ISO 17972-1 Graphic technology — Colour data exchange format (CxF/X) — Part 1: Relationship to CxF3 (CxF/X-1)
- ISO 17972-2 Graphic technology — Colour data exchange format (CxF/X) — Part 2: Scanner target data (CxF/X-2)
- ISO 17972-3 Graphic technology — Colour data exchange format (CxF/X) — Part 3: Output target data (CxF/X-3)
- ISO 17972-4 Graphic technology — Colour data exchange format (CxF/X) — Part 4: Spot colour characterization data (CxF/X-4)

ISO 17972-4

Color exchange format – spot colour characterization

- **ISO Standard – History of development**
- **Standard Requirements**
- **Workflows**
- **Proofing**
- **Ink Formulation**

Color Exchange History


GretagMacbeth

CxF – Color Exchange Format

The universal language to communicate colors digitally

Abstract: In a global world, communicating electronically the color data of spot colors is a hot (and not yet solved) issue. Global workflows and value chains, whether they are found in a B2B or B2C process, as well as an in-house digital workflow from designer to press, are demanding adequate and effective means to communicate (spot) colors. CxF is a new standard allowing seamless, worldwidedigital communication of all commercially significant aspects of spot colors. Furthermore, CxF is defined in a completely open way so that all aspects of a color can be communicated, even when the application and the color communication features required are unknown. For example, every software vendor implementing / supporting CxF is able to extend the basic feature set to the needs of a new application without affecting the general usability. Wherever color communication is mission critical, CxF should be considered to be the solution to the problem!

- 1990-2001 Proprietary Formats ASCII Text
- 2001- Gretag Macbeth developed Cxf for communication ac systems- for spot color communications
- 2002 – Gretag Macbeth offered Cxf to ISO as a replacement for ASCII TXT files
- 2002 CGATS 17 started - 2005 CGATS 17 publish
- CxF-Version 1 incorporated into standards
- 2006 GWG starts discussing how to optimize Spot colours in PDF/X proofing Solutions – xmp?
- 2009 ICC recommends Cxf for spectral data
- 2010 ISO starts to discuss adding CxF to PDFX in mixing hints
- 2012 ISO 15930 allows CxF spectral data in PDFX
- 2014 ISO 17972-1 Published
- 2014 ISO DIS 17972-2 and 17972-4 Approved

ISO 17972-4

DRAFT INTERNATIONAL STANDARD
ISO/DIS 17972-4

ISO/TC 130 Secretariat: SAC
Voting begins on: 2014-08-11 Voting terminates on: 2014-11-11

Graphic technology — Colour data exchange format (CxF/X) —
Part 4:
Spot colour characterisation data (CxF/X-4)

Technologie graphique — Échange des données de couleur en utilisant CxF —
Partie 4: Données de caractérisation des points de couleur

ICS: 35.240.30;37.100.99

Graphic technology — Colour data exchange format (CxF/X) — Part 4: Spot colour characterisation data (CxF/X-4)

Scope

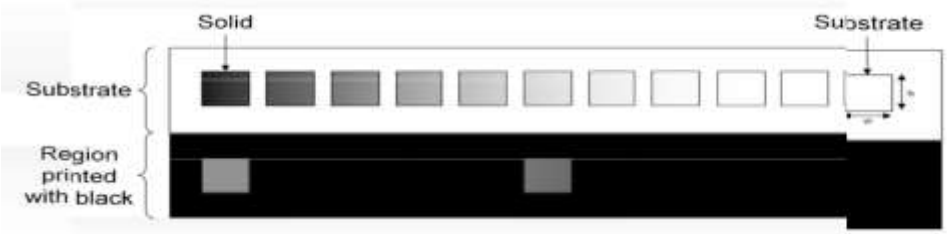
This part of ISO 17972 defines an exchange format for spectral measurement data of inks to provide a means to characterize spot colour inks to allow reliable printing and proofing of products that have been designed using these inks. Only isotropic (paper-like) substrates are within the scope of this standard which is limited to application areas where the same ink and paper combination that has been characterized is used when printing.

ISO DIS 17972-4

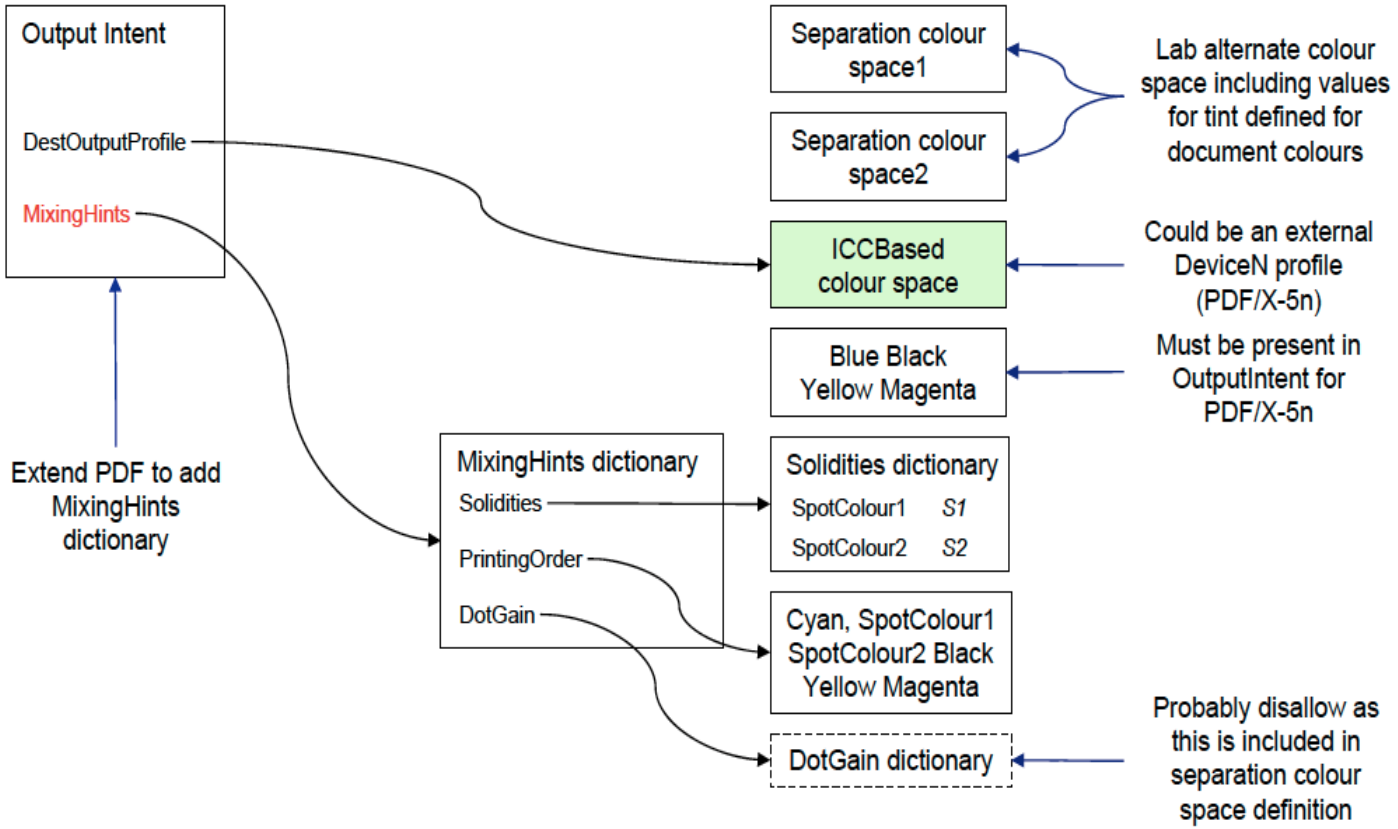
Conformance levels

This specification defines three conformance levels identified as CxF/X-4, CxF/X-4a and CxF/X-4b. These conformance levels allow different methods of spot colour communication in common use to be described.

Type of measurement	CxF/X-4	CxF/X-4a	CxF/X-4b
Solid ink printed on substrate	Required	Required	Required
Tints of ink printed on substrate	3 minimum, 11 recommended	3 minimum, 11 recommended	No requirement
Tints of ink printed on black background	3 minimum	No requirement	No requirement



Proposed PDF support for spot colour inks (revised proposal)



Define how Solidities values should be interpreted

Current PDF/X Workflow without CxF/X-4

No overprint

No Opacity

No Ink rotation

ISO 17972-4 - CxF X4 Spot Colours

From Design through Print Consistency
Utilizing PDF X as the document to carry CXF X4 data

Objectives

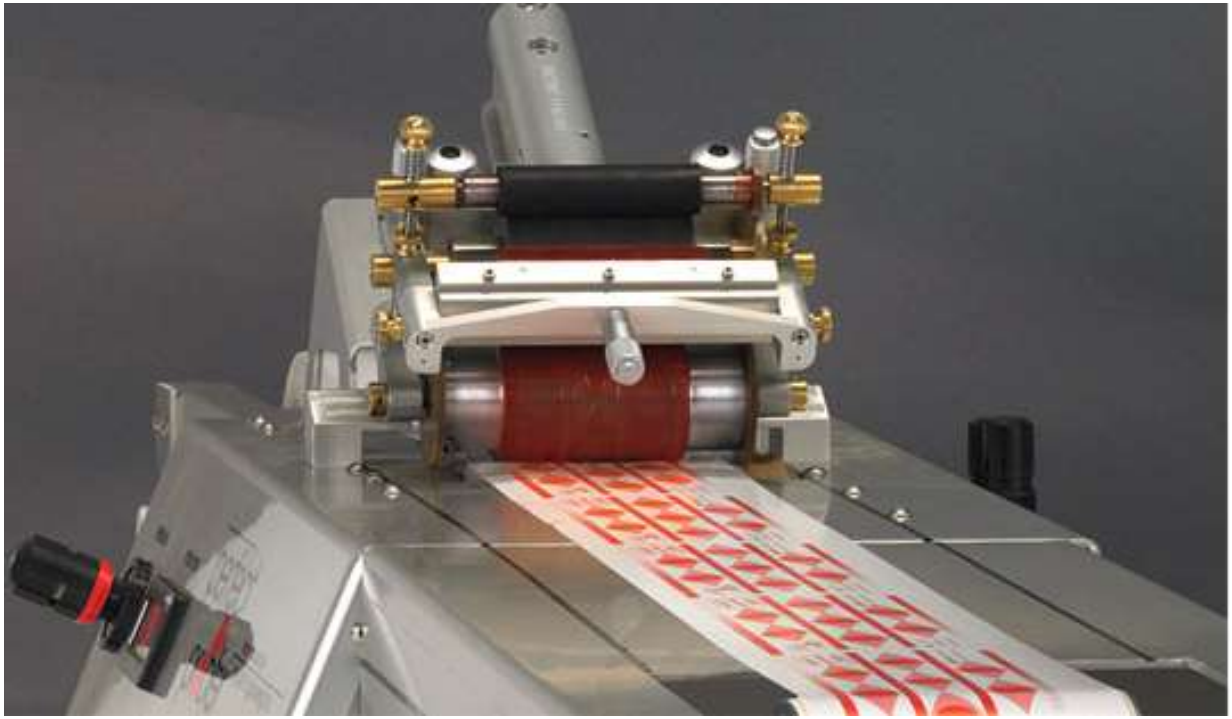
Designers can create a printable product that meets the brand requirements for colour

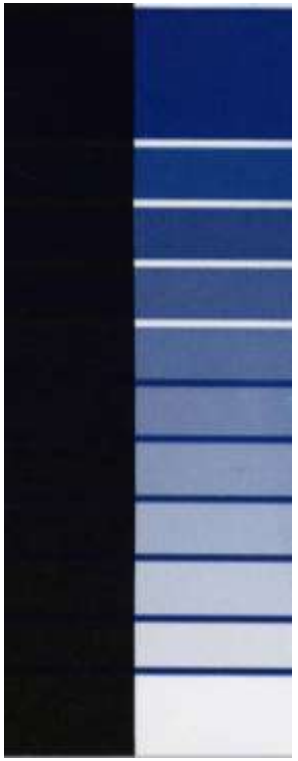
Design can be proofed accurately on monitor or on hard copy proof

Package (or other product) can be printed as the designer intended

Brand Management

- Developing Colour to align with CPC requirement - Actual INKS!





ANSI.txt

LGOROWLEN	2									
Measuremer	strip									
CREATED	5/14/2012 # Time: 08:07									
INSTRUMEN	SpectroEye									
MEASUREMI	Illumination=D65 ObserverAngle=2= WhiteBase=Abs Filter=No									
ILLUMINATIC	D50									
OBSERVER_/	2									
KEYWORD	SampleID									
KEYWORD	SAMPLE_NAME									
NUMBER_OI	36									
BEGIN_DATA_FORMAT										
SampleID	SAMPLE_NA	nm380	nm390	nm400	nm410	nm420	nm430	nm440	nm450	nm460
END_DATA_FORMAT										
NUMBER_OI	22									
BEGIN_DATA										
1	A1	0.707	0.747	0.777	0.7986	0.818	0.835	0.849	0.8614	0.871
2	A2	0.013	0.014	0.014	0.0144	0.015	0.015	0.015	0.0158	0.016
3	B1	0.628	0.652	0.676	0.6954	0.711	0.726	0.739	0.7498	0.755
4	B2	0.015	0.013	0.014	0.0142	0.014	0.015	0.015	0.0153	0.016
5	C1	0.545	0.575	0.587	0.6134	0.627	0.641	0.654	0.6636	0.667
6	C2	0.015	0.014	0.014	0.0146	0.015	0.015	0.015	0.0157	0.016
7	D1	0.476	0.499	0.526	0.5298	0.542	0.555	0.568	0.5761	0.576
8	D2	0.015	0.015	0.015	0.0155	0.016	0.016	0.016	0.0166	0.017
9	E1	0.393	0.414	0.427	0.4379	0.449	0.462	0.474	0.4814	0.479
10	E2	0.017	0.016	0.017	0.0166	0.017	0.017	0.017	0.0174	0.017
11	F1	0.315	0.333	0.341	0.351	0.361	0.372	0.384	0.3906	0.387
12	F2	0.016	0.017	0.017	0.017	0.017	0.018	0.018	0.0179	0.018
13	G1	0.256	0.269	0.275	0.2801	0.292	0.303	0.315	0.3213	0.316
14	G2	0.019	0.018	0.018	0.0179	0.018	0.018	0.018	0.0185	0.018
15	H1	0.19	0.2	0.205	0.2104	0.219	0.229	0.241	0.2466	0.24
16	H2	0.02	0.019	0.019	0.0187	0.019	0.019	0.019	0.0193	0.019
17	I1	0.137	0.144	0.148	0.1529	0.161	0.171	0.183	0.1887	0.181
18	I2	0.019	0.019	0.019	0.0191	0.019	0.019	0.019	0.0194	0.019
19	J1	0.128	0.137	0.139	0.1454	0.155	0.166	0.179	0.1852	0.177
20	J2	0.021	0.021	0.02	0.0202	0.02	0.02	0.02	0.0205	0.02
21	K1	0.08	0.086	0.087	0.0916	0.099	0.109	0.12	0.1253	0.117
22	K2	0.02	0.019	0.019	0.0189	0.019	0.019	0.019	0.0193	0.019

SampleID	SAMPLE_NA	nm470	nm480	nm490	nm500	nm510	nm520	nm530	nm540	nm550	nm560	nm570	nm580	nm590
1	A1	0.874	0.875	0.875	0.873	0.87	0.863	0.849	0.852	0.867	0.87	0.866	0.858	0.855
2	A2	0.016	0.017	0.017	0.018	0.018	0.018	0.019	0.019	0.019	0.02	0.02	0.02	0.02
3	B1	0.753	0.746	0.738	0.731	0.726	0.719	0.706	0.707	0.72	0.722	0.719	0.714	0.715
4	B2	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.018	0.018	0.019	0.019
5	C1	0.66	0.648	0.635	0.624	0.627	0.609	0.598	0.598	0.608	0.61	0.609	0.606	0.61
6	C2	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.018	0.019
7	D1	0.566	0.549	0.531	0.517	0.508	0.499	0.489	0.489	0.497	0.499	0.498	0.499	0.505
8	D2	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.018	0.018	0.018	0.019
9	E1	0.465	0.444	0.423	0.406	0.396	0.387	0.378	0.377	0.383	0.384	0.385	0.388	0.396
10	E2	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.019	0.019
11	F1	0.37	0.346	0.321	0.303	0.292	0.284	0.276	0.274	0.279	0.281	0.282	0.286	0.295
12	F2	0.017	0.017	0.016	0.016	0.015	0.015	0.015	0.016	0.017	0.017	0.018	0.018	0.019
13	G1	0.297	0.271	0.245	0.226	0.215	0.207	0.2	0.198	0.202	0.204	0.206	0.211	0.221
14	G2	0.018	0.017	0.016	0.016	0.015	0.015	0.015	0.016	0.017	0.017	0.018	0.019	0.02
15	H1	0.22	0.193	0.167	0.148	0.138	0.131	0.125	0.124	0.127	0.129	0.131	0.137	0.147
16	H2	0.018	0.017	0.016	0.016	0.015	0.015	0.015	0.016	0.017	0.017	0.018	0.019	0.02
17	I1	0.16	0.132	0.106	0.088	0.078	0.072	0.068	0.067	0.07	0.071	0.074	0.08	0.09
18	I2	0.019	0.017	0.016	0.015	0.015	0.015	0.015	0.016	0.016	0.017	0.018	0.019	0.02
19	J1	0.155	0.123	0.091	0.068	0.056	0.048	0.042	0.041	0.044	0.046	0.05	0.059	0.073
20	J2	0.019	0.018	0.017	0.016	0.015	0.015	0.015	0.016	0.017	0.018	0.019	0.02	0.021
21	K1	0.097	0.07	0.046	0.032	0.026	0.023	0.021	0.021	0.023	0.024	0.026	0.03	0.037
22	K2	0.018	0.017	0.016	0.015	0.014	0.014	0.014	0.015	0.016	0.017	0.018	0.019	0.02

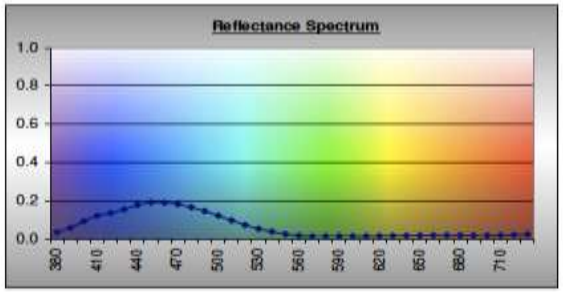
SampleID	SAMPLE_NA	nm600	nm610	nm620	nm630	nm640	nm650	nm660	nm670	nm680	nm690	nm700	nm710	nm720	nm730
1	A1	0.852	0.853	0.862	0.873	0.887	0.899	0.911	0.913	0.913	0.911	0.913	0.917	0.92	0.925
2	A2	0.02	0.021	0.021	0.022	0.023	0.023	0.024	0.025	0.025	0.026	0.026	0.027	0.028	0.029
3	B1	0.717	0.726	0.742	0.755	0.767	0.776	0.787	0.794	0.8	0.806	0.814	0.82	0.822	0.836
4	B2	0.019	0.02	0.02	0.021	0.022	0.022	0.023	0.024	0.024	0.025	0.025	0.026	0.027	0.028
5	C1	0.616	0.63	0.651	0.665	0.676	0.683	0.693	0.703	0.714	0.725	0.737	0.745	0.746	0.749
6	C2	0.019	0.02	0.021	0.021	0.021	0.022	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.027
7	D1	0.514	0.534	0.559	0.574	0.583	0.588	0.599	0.611	0.627	0.643	0.658	0.668	0.669	0.671
8	D2	0.02	0.02	0.021	0.022	0.022	0.022	0.023	0.023	0.024	0.025	0.025	0.026	0.026	0.027
9	E1	0.408	0.433	0.462	0.478	0.485	0.489	0.499	0.514	0.534	0.555	0.575	0.586	0.586	0.588
10	E2	0.02	0.021	0.022	0.022	0.022	0.022	0.023	0.024	0.024	0.025	0.025	0.026	0.026	0.027
11	F1	0.309	0.337	0.369	0.385	0.391	0.393	0.402	0.419	0.443	0.468	0.491	0.504	0.503	0.505
12	F2	0.02	0.021	0.022	0.022	0.022	0.022	0.022	0.023	0.024	0.024	0.025	0.026	0.026	0.027
13	G1	0.236	0.265	0.3	0.317	0.321	0.322	0.331	0.35	0.376	0.404	0.429	0.443	0.442	0.443
14	G2	0.021	0.022	0.023	0.023	0.022	0.022	0.023	0.023	0.024	0.025	0.025	0.026	0.026	0.027
15	H1	0.163	0.192	0.227	0.245	0.248	0.248	0.257	0.277	0.305	0.336	0.363	0.378	0.376	0.377
16	H2	0.021	0.022	0.023	0.023	0.023	0.022	0.023	0.023	0.024	0.025	0.026	0.026	0.026	0.027
17	I1	0.106	0.136	0.172	0.189	0.192	0.192	0.201	0.221	0.252	0.284	0.314	0.329	0.327	0.328
18	I2	0.021	0.022	0.024	0.023	0.023	0.022	0.022	0.023	0.024	0.025	0.025	0.026	0.026	0.027
19	J1	0.093	0.129	0.168	0.186	0.189	0.189	0.198	0.22	0.251	0.284	0.314	0.33	0.327	0.328
20	J2	0.022	0.024	0.025	0.024	0.024	0.023	0.024	0.024	0.025	0.025	0.026	0.026	0.027	0.027
21	K1	0.05	0.078	0.113	0.131	0.134	0.133	0.142	0.163	0.195	0.228	0.26	0.277	0.275	0.275
22	K2	0.021	0.022	0.023	0.023	0.022	0.022	0.022	0.023	0.023	0.024	0.025	0.026	0.026	0.026

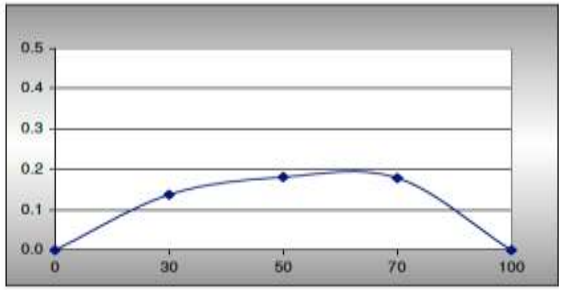
Color Definitions of Brand Colors – Physical and Digital

Spot Color Definition

Birdseye 294 Redesign

Spectral Data		
	Over White	Over Black
380	0.0345	0.0176
390	0.0569	0.0184
400	0.0916	0.0188
410	0.1209	0.0184
420	0.1352	0.0173
430	0.1539	0.0169
440	0.1772	0.0165
450	0.1910	0.0161
460	0.1897	0.0155
470	0.1807	0.0149
480	0.1655	0.0141
490	0.1453	0.0133
500	0.1217	0.0125
510	0.0967	0.0116
520	0.0726	0.0106
530	0.0525	0.0096
540	0.0371	0.0088
550	0.0246	0.0080
560	0.0163	0.0076
570	0.0132	0.0078
580	0.0133	0.0085
590	0.0135	0.0088
600	0.0136	0.0091
610	0.0143	0.0096
620	0.0152	0.0103
630	0.0159	0.0106
640	0.0166	0.0110
650	0.0175	0.0111
660	0.0184	0.0110
670	0.0187	0.0107
680	0.0181	0.0106
690	0.0177	0.0106
700	0.0176	0.0112
710	0.0186	0.0124
720	0.0207	0.0134
730	0.0237	0.0145

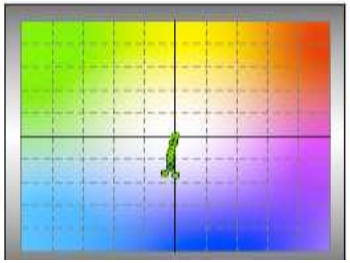


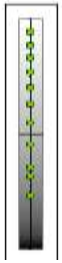


Spot Over White						
Dot %	L	a	b	C	H	TVI
0	94.62	0.27	0.35	0.44	52.6	0%
10	88.40	-0.48	-2.69	2.73	259.8	17%
20	82.97	-1.17	-5.58	5.71	258.2	31%
30	77.05	-1.85	-8.70	8.89	258.0	44%
40	70.30	-2.63	-12.39	12.66	258.0	57%
50	63.11	-3.38	-16.47	16.81	258.4	68%
60	54.93	-3.91	-20.92	21.28	259.4	79%
70	45.58	-4.16	-26.36	26.69	261.0	88%
80	35.71	-4.23	-33.77	34.03	262.9	95%
90	31.69	-8.32	-40.11	40.96	258.3	98%
100	23.32	-0.06	-42.80	42.80	269.9	100%

Specs	
Opacity(Y ratio)	24%
Spectral Density	1.88
DotGain @ 50%	18%
Print Cont @ 70%	50%

Pigments
Reflex Blue
Pro Blue
Blk
-

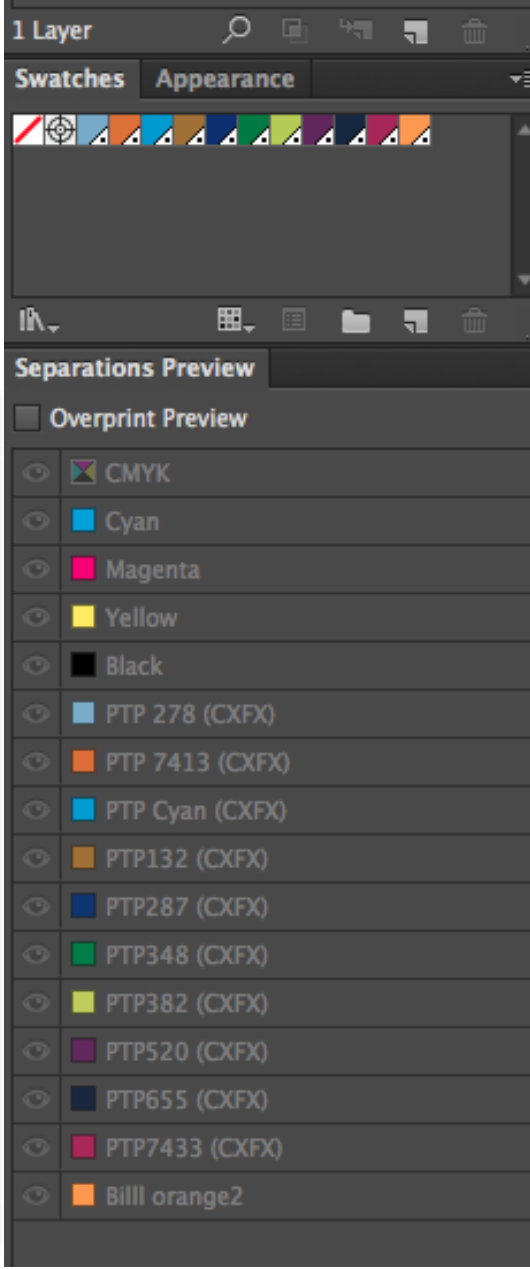




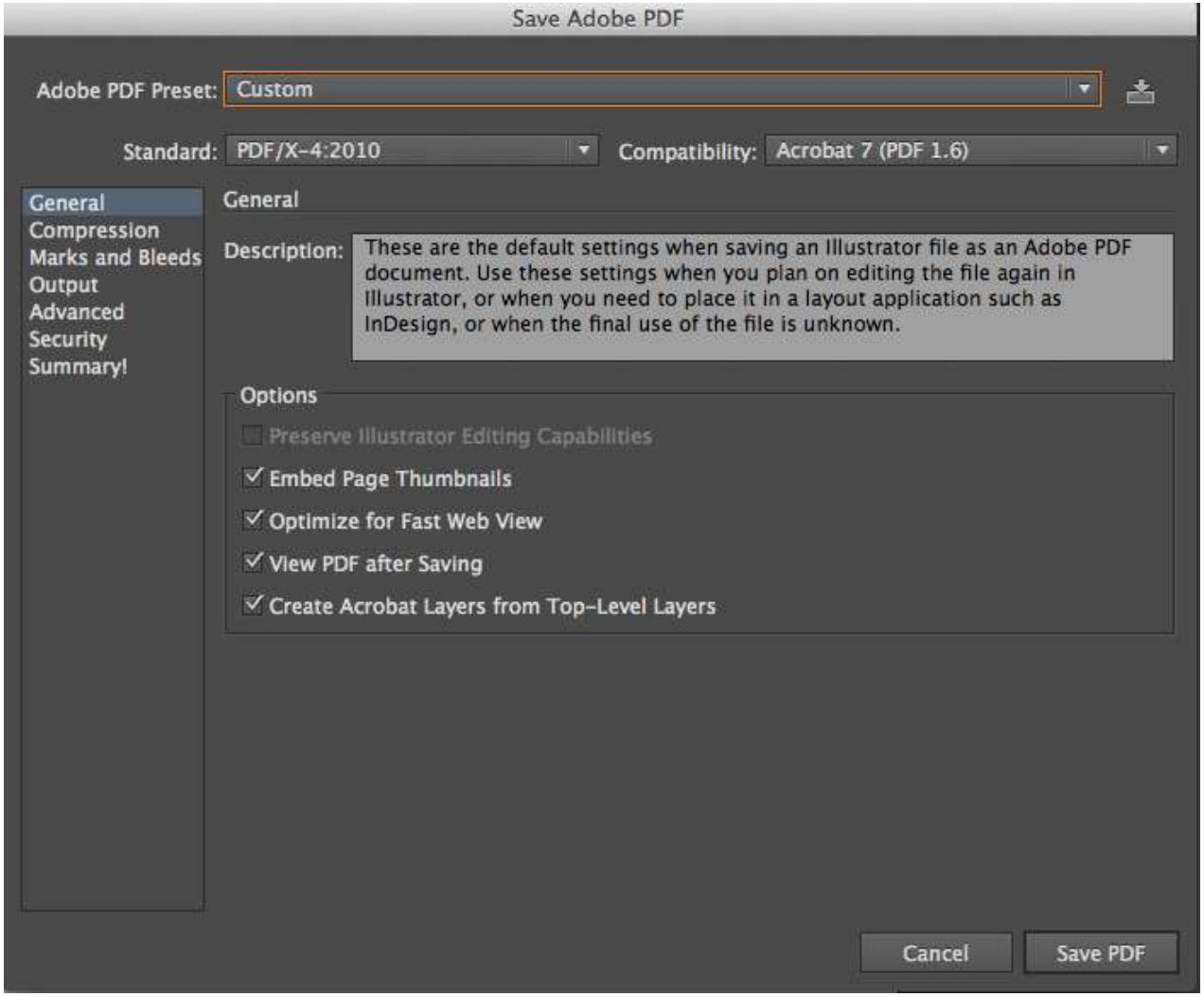
Birdseye 294 Redesign	
Brand Color	Birdseye 294 Redesign
Substrate	SBS
Backer	ISO 13655 White
Meas Device	Xrite SpectroEye (Certified: 12/2011)
Meas Conditions	5000K, 2°, No Filter
Geometry	0/45 (M0 - ISO13655)
Expiry Date	3/8/2013

Approved By	Color Engineering
Date	3/8/2012

CxF X4 in Adobe Illustrator



Save as Adobe PDF/X



PDF X4 Output

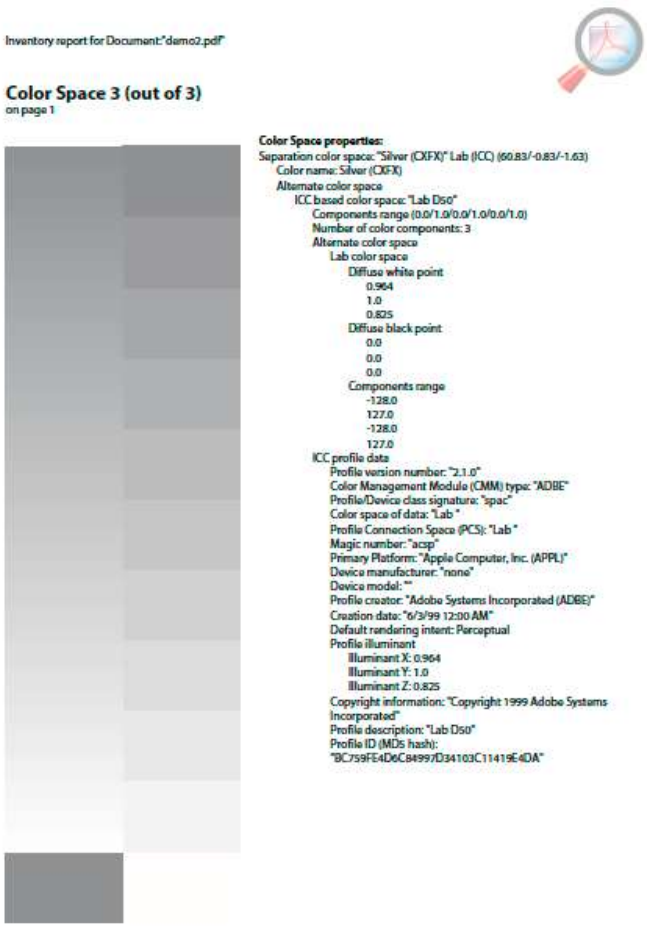
Adobe® Acrobat® XI

Version 11.0.03

Inventory report for Document:"demo2.pdf"

Color Space 2 (out of 3)
on page 1

Color Space properties:
Separation color space: "Orange (CXFX)" Lab (ICC) (60.29/62.38/69.67)
Color name: Orange (CXFX)
Alternate color space
ICC based color space: "Lab D50"
Components range (0.0/1.0/0.0/1.0/0.0/1.0)
Number of color components: 3
Alternate color space
Lab color space
Diffuse white point
0.964
1.0
0.825
Diffuse black point
0.0
0.0
0.0
Components range
-128.0
127.0
-128.0
127.0
ICC profile data
Profile version number: "2.1.0"
Color Management Module (CMM) type: "ADBE"
Profile/Device class signature: "spac"
Color space of data: "Lab "
Profile Connection Space (PCS): "Lab "
Magic number: "acsp"
Primary Platform: "Apple Computer, Inc. (APPL)"
Device manufacturer: "none"
Device model: ""
Profile creator: "Adobe Systems Incorporated (ADBE)"
Creation date: "6/3/99 12:00 AM"
Default rendering intent: Perceptual
Profile illuminant
Illuminant X: 0.964
Illuminant Y: 1.0
Illuminant Z: 0.825
Copyright information: "Copyright 1999 Adobe Systems Incorporated"
Profile description: "Lab D50"
Profile ID (MD5 hash):
"BC759FE4D6C84997D34103C11419E4DA"



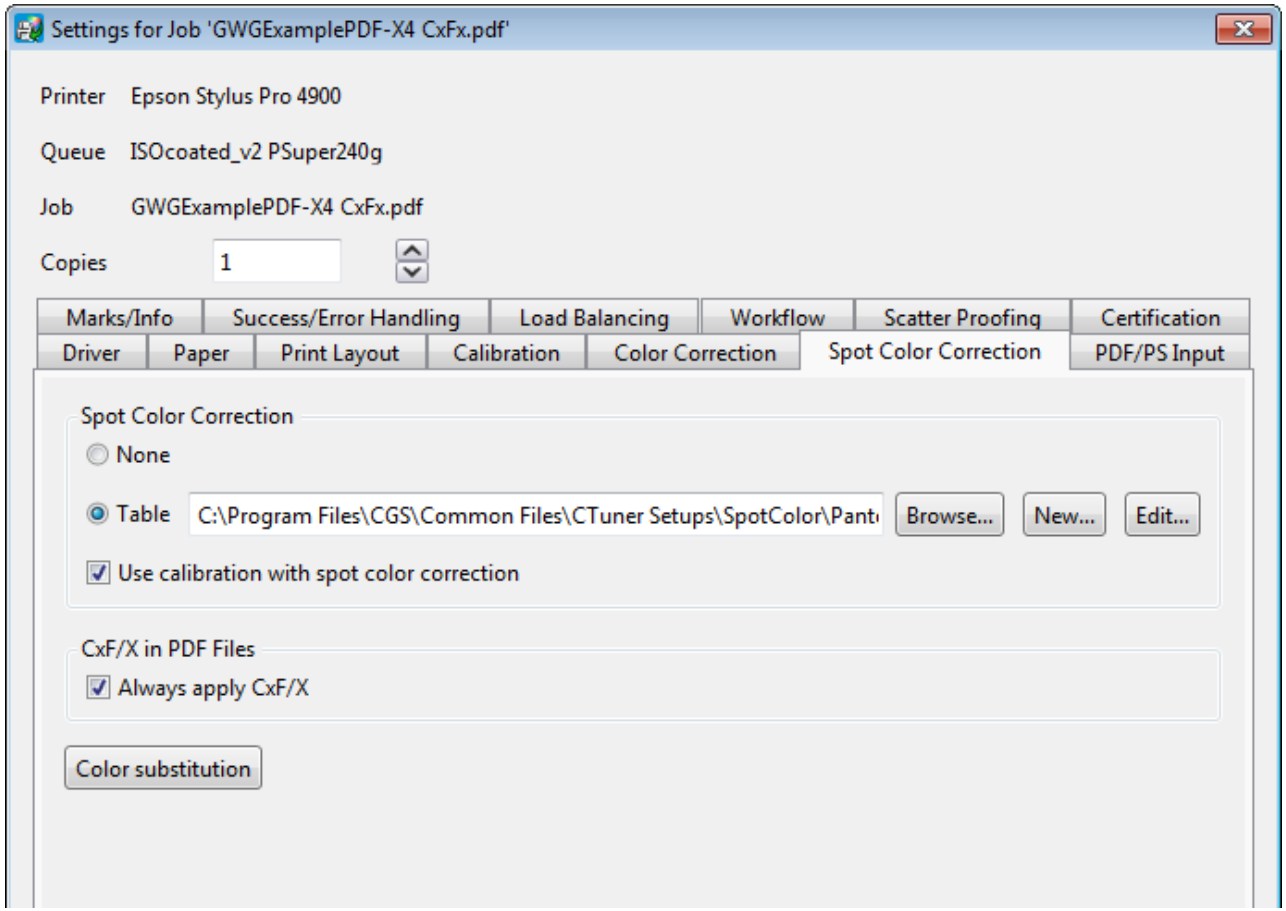
Inventory report for Document:"demo2.pdf"

Color Space 3 (out of 3)
on page 1

Color Space properties:
Separation color space: "Silver (CXFX)" Lab (ICC) (60.83/-0.83/-1.63)
Color name: Silver (CXFX)
Alternate color space
ICC based color space: "Lab D50"
Components range (0.0/1.0/0.0/1.0/0.0/1.0)
Number of color components: 3
Alternate color space
Lab color space
Diffuse white point
0.964
1.0
0.825
Diffuse black point
0.0
0.0
0.0
Components range
-128.0
127.0
-128.0
127.0
ICC profile data
Profile version number: "2.1.0"
Color Management Module (CMM) type: "ADBE"
Profile/Device class signature: "spac"
Color space of data: "Lab "
Profile Connection Space (PCS): "Lab "
Magic number: "acsp"
Primary Platform: "Apple Computer, Inc. (APPL)"
Device manufacturer: "none"
Device model: ""
Profile creator: "Adobe Systems Incorporated (ADBE)"
Creation date: "6/3/99 12:00 AM"
Default rendering intent: Perceptual
Profile illuminant
Illuminant X: 0.964
Illuminant Y: 1.0
Illuminant Z: 0.825
Copyright information: "Copyright 1999 Adobe Systems Incorporated"
Profile description: "Lab D50"
Profile ID (MD5 hash):
"BC759FE4D6C84997D34103C11419E4DA"

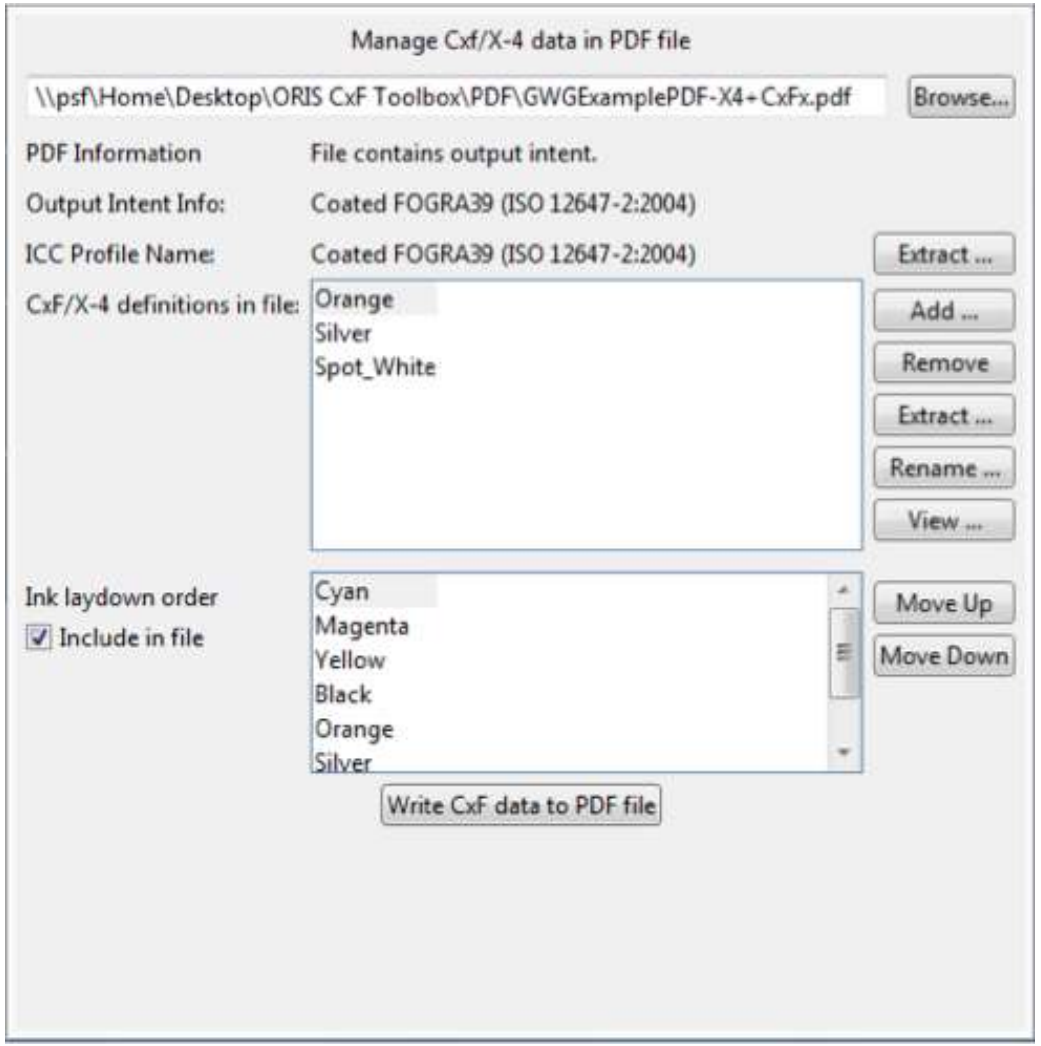
CxF X-4 Proofing

- Look for solutions that utilize CxF / Hard and Soft Proof



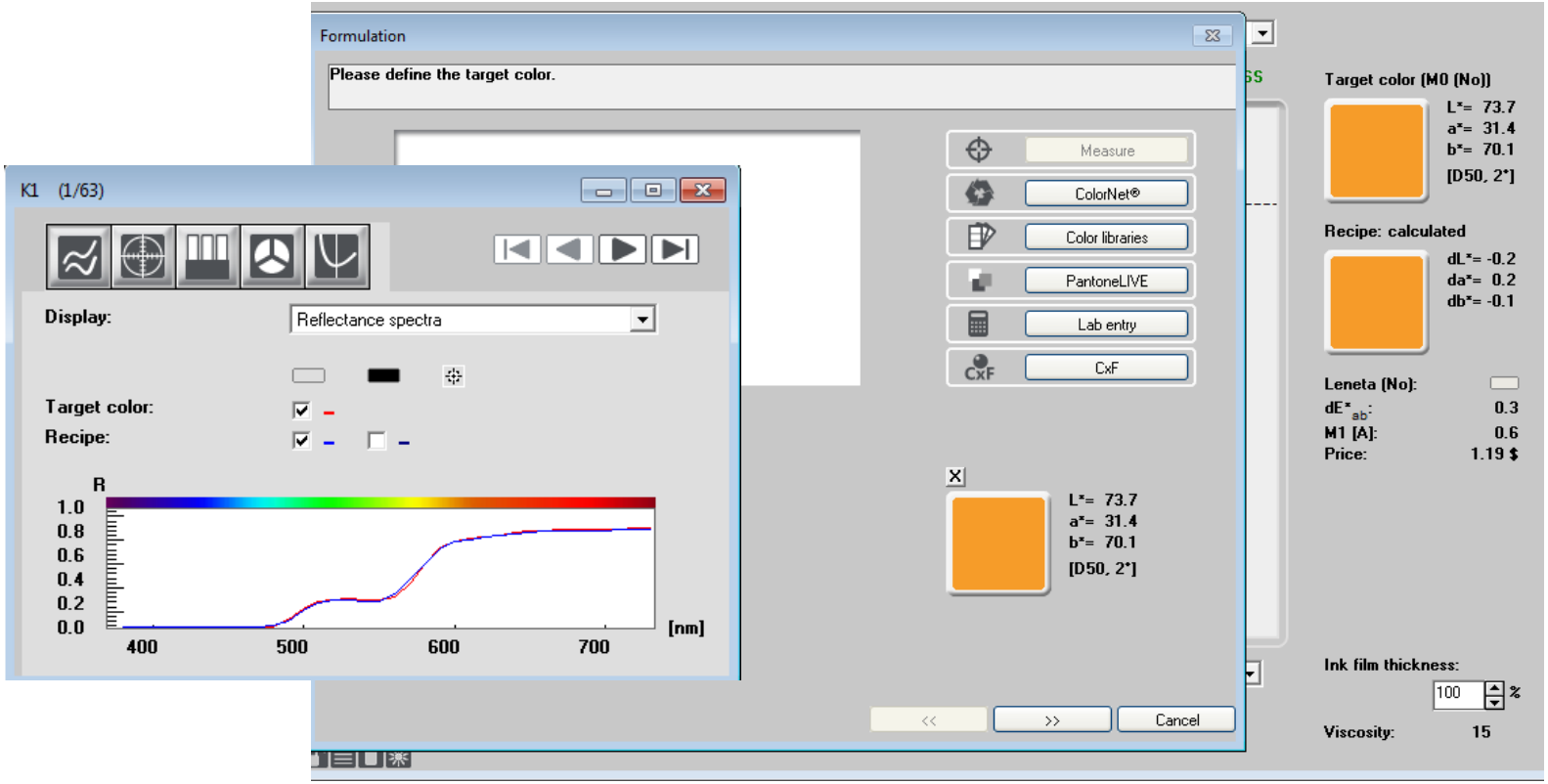
CxF/X-4 Work Flows

- CxFX Tools for Extracting Data
- Re-ordering Colors in PDFX

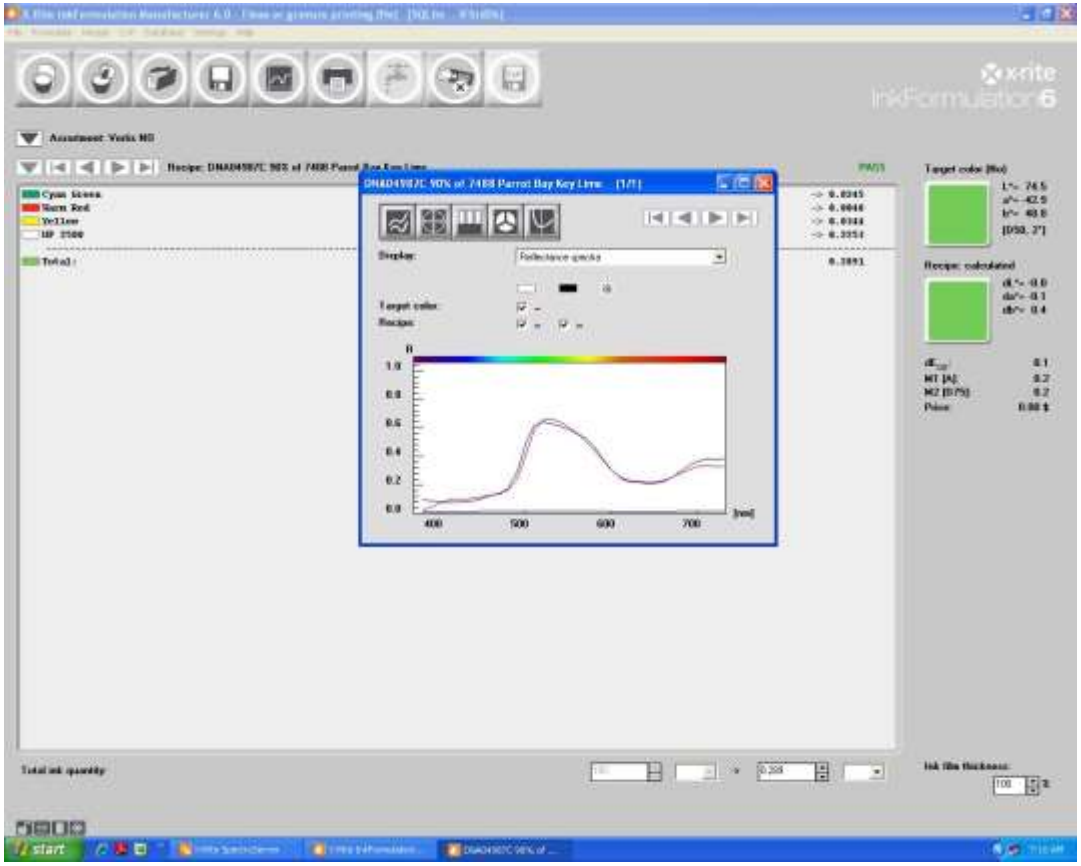


CxF/X for Ink Formulation

- Use CxF/X for ink formulation – Lowest Metameric Index - (Same Ingredients)

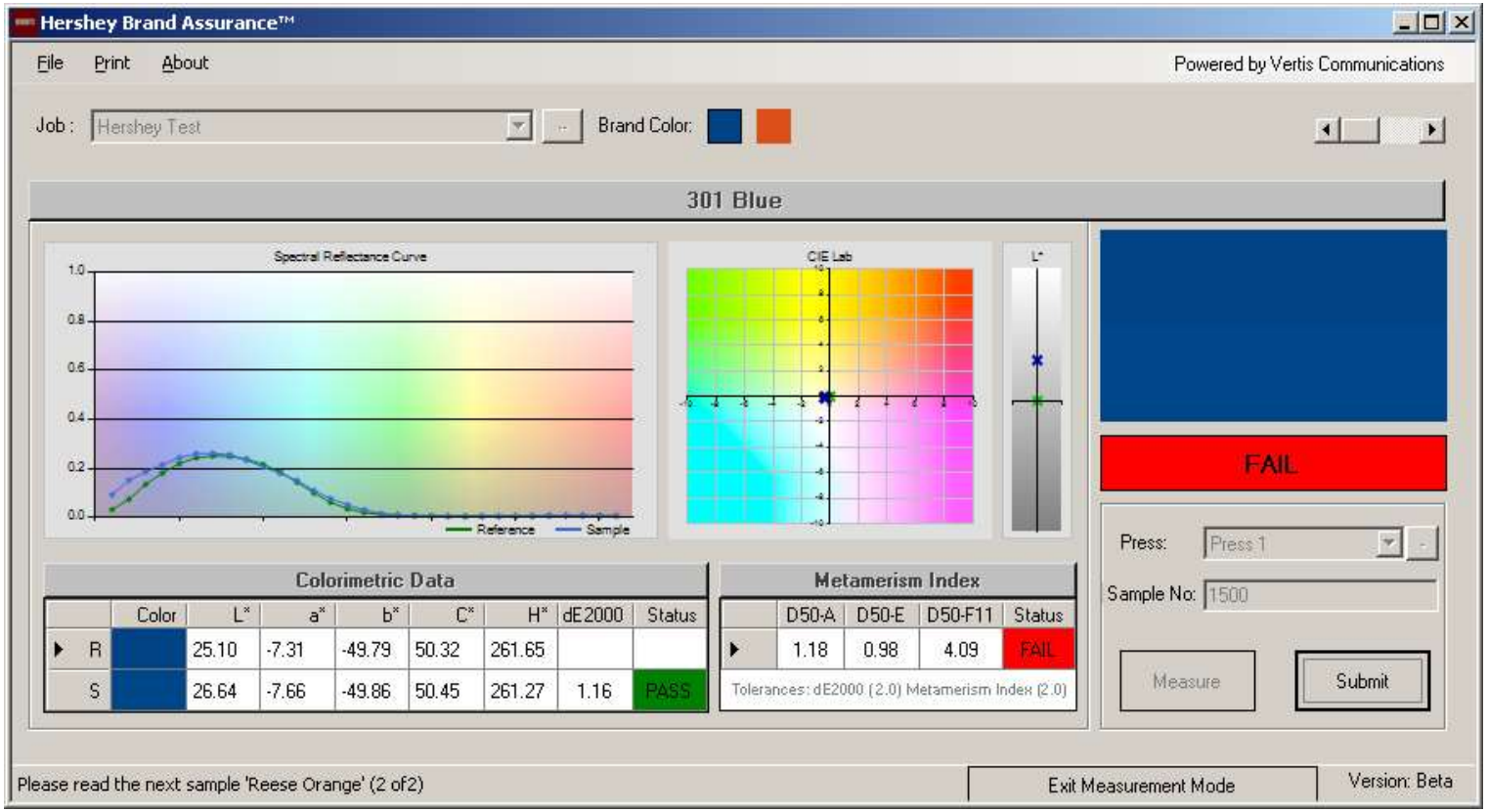


Ink Formulation – CxF/X Define Aims Matching PMS or other element

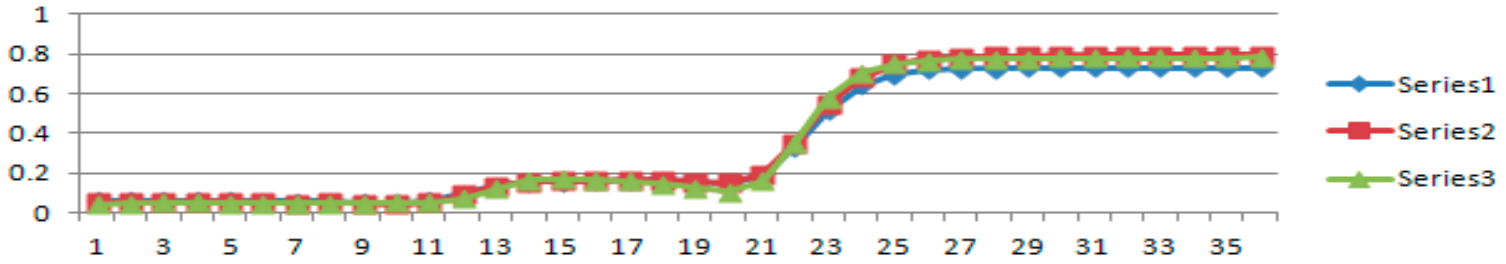


•ISO 17972-4 – CxF/X4 Spot Colours Process Control

From Design through Print Consistency in ingredients of inks
NOT only low DE00 / but satisfying metameric match also



Print Process Selection

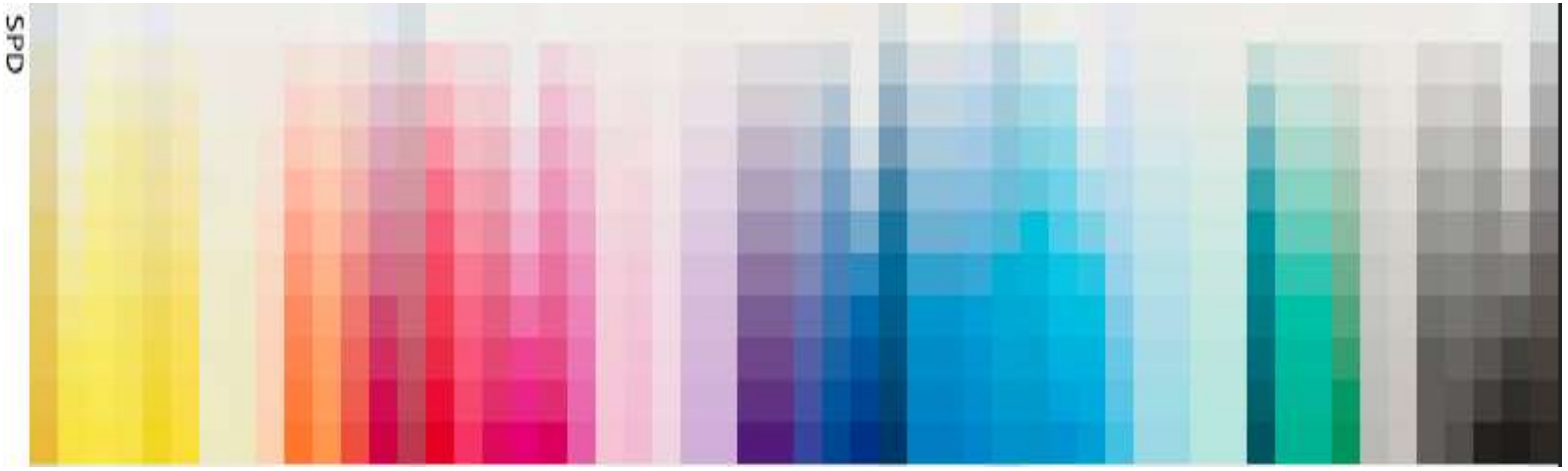


Spot Colour Halftone Metric

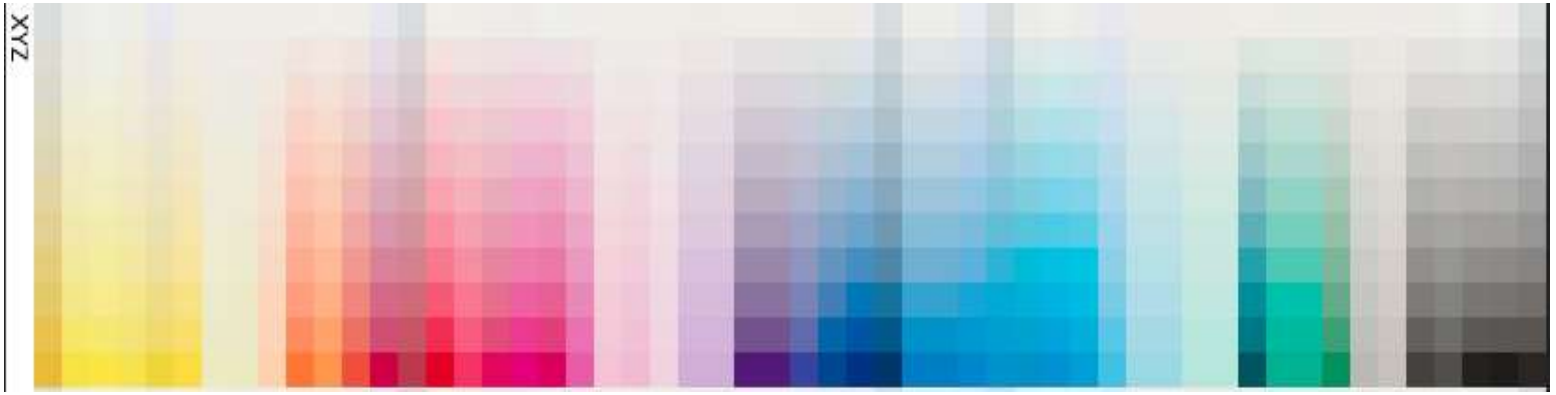
ISO – 20654 SCTV

ISO Spectral Density

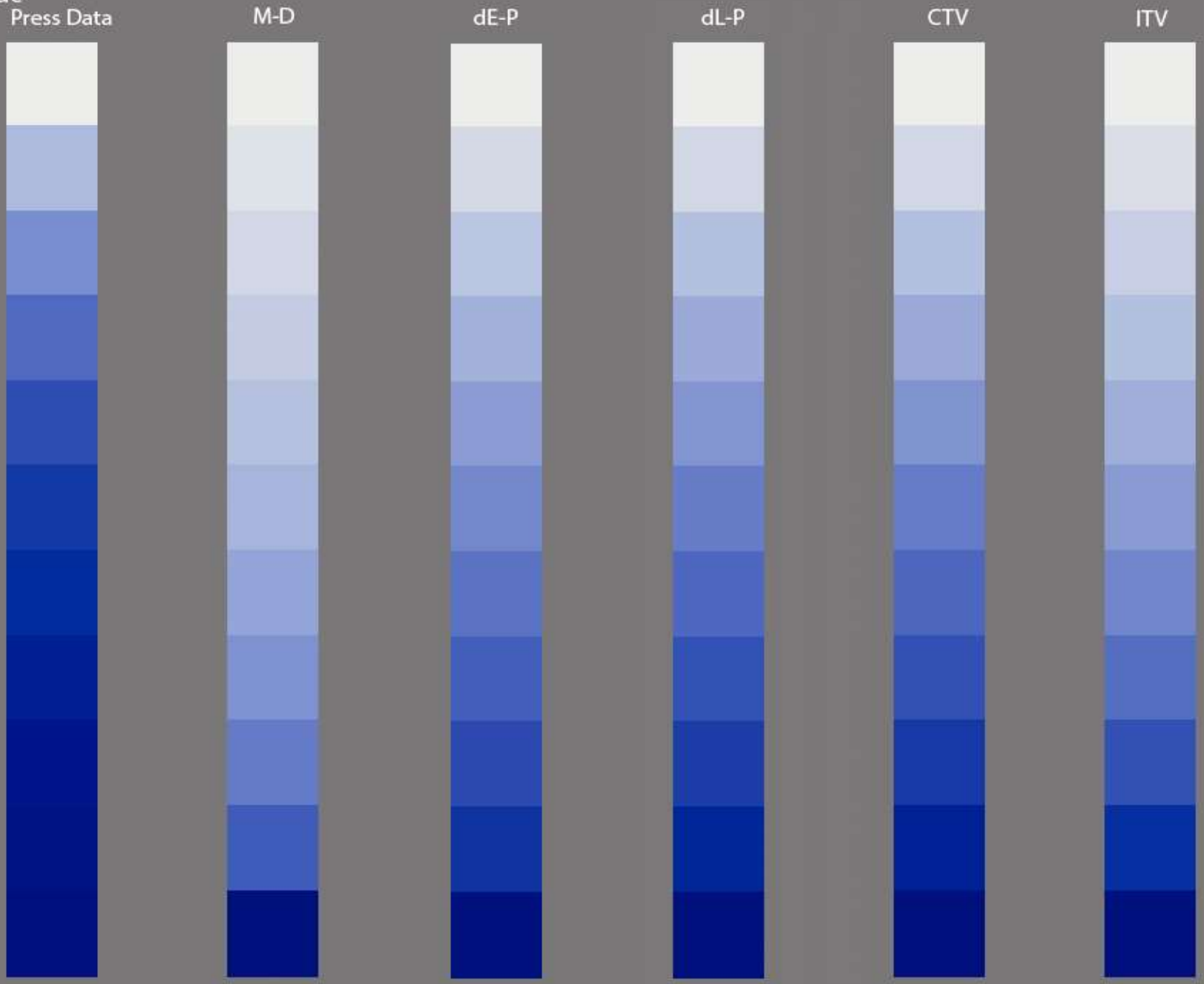
ISO 5.3 Spectral Density



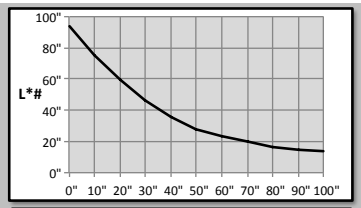
Illustrator or Photoshop visual appearnce

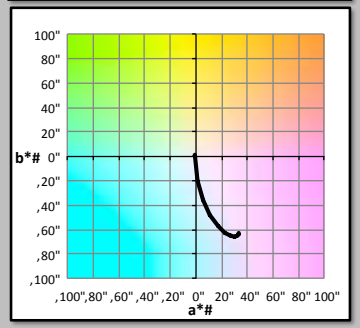


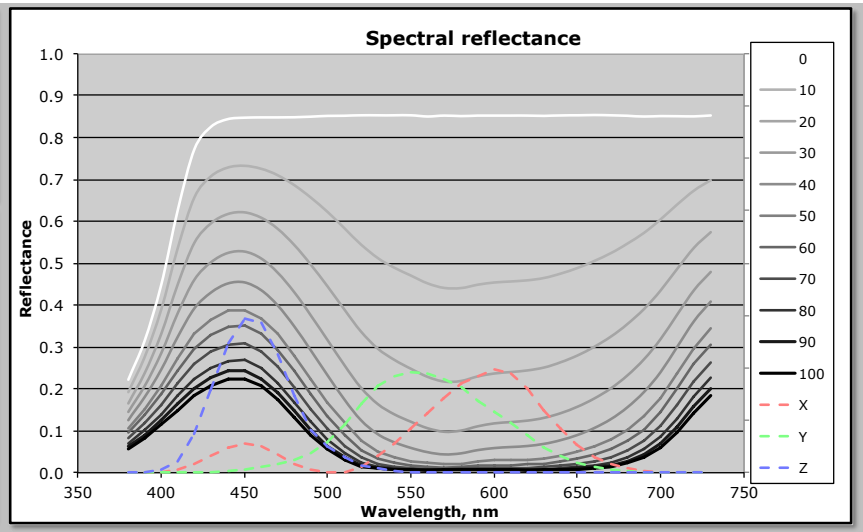
ReflexBlue



Problem Defined

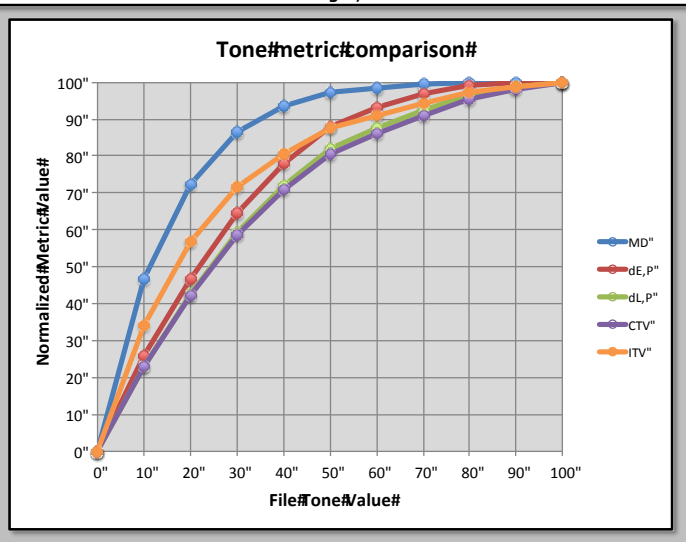




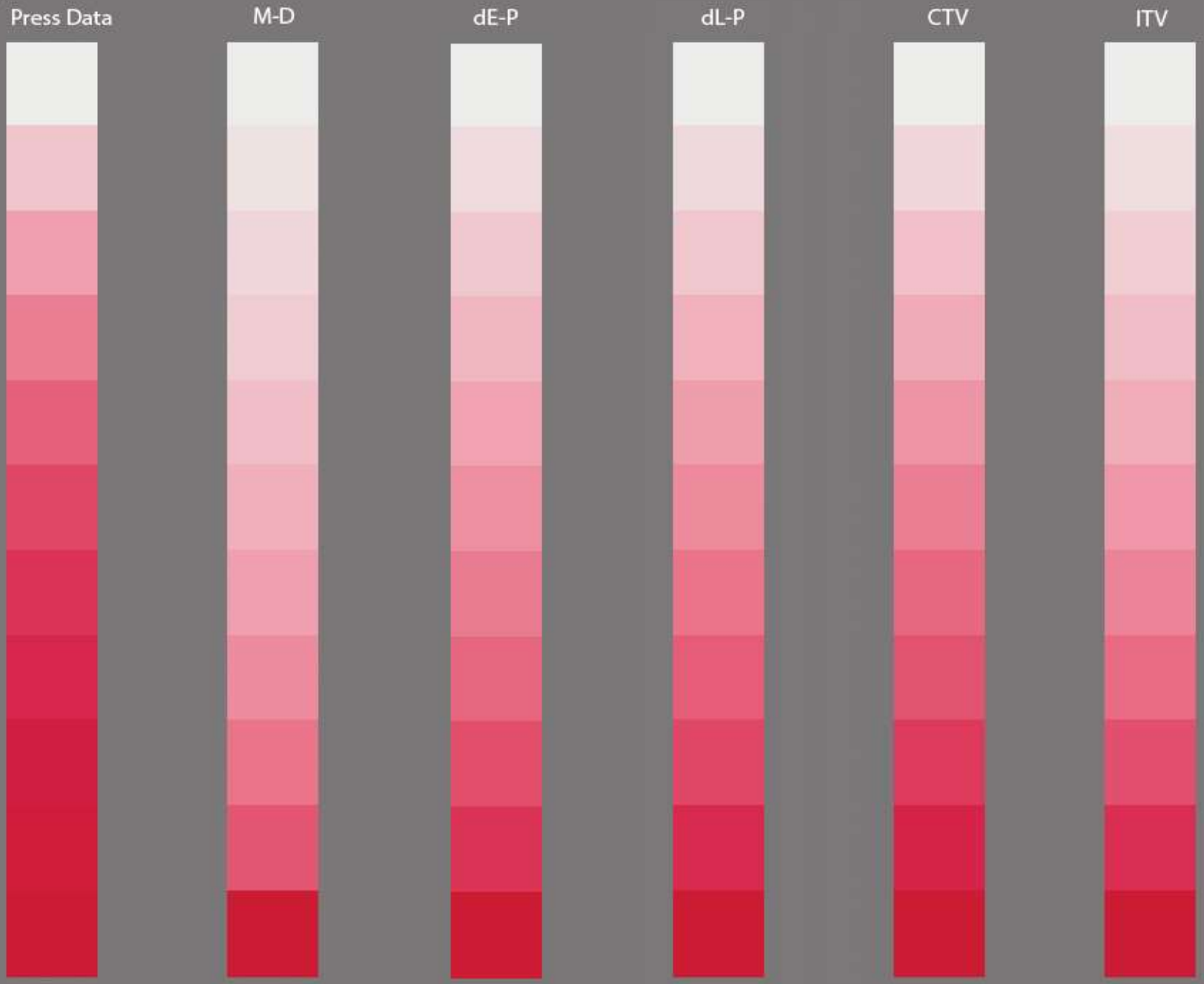


Reflex(Blue(

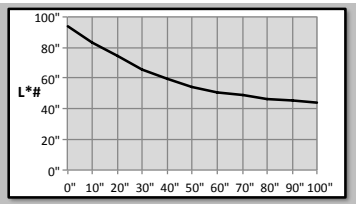
File TV	MD	dE-P	dL-P	CTV	ITV
0	0.0	0	0.0	0	0
10	46.7	25.8	22.9	22.8	34.21
20	72.2	46.7	42.5	42.1	56.74
30	86.3	64.6	59.2	58.4	71.44
40	93.4	77.9	71.9	70.7	80.69
50	97.1	87.8	82.0	80.6	87.49
60	98.5	93.1	87.6	86.1	90.98
70	99.3	96.9	92.4	91.1	94.29
80	99.8	99.2	96.3	95.4	97.12
90	99.9	100.0	98.6	98.1	98.85
100	100.0	100.0	100.0	100.0	100.00

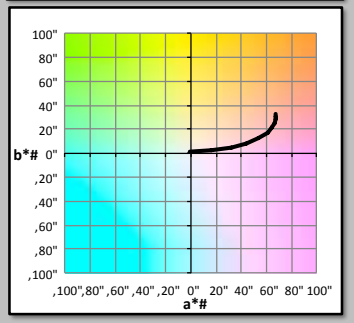


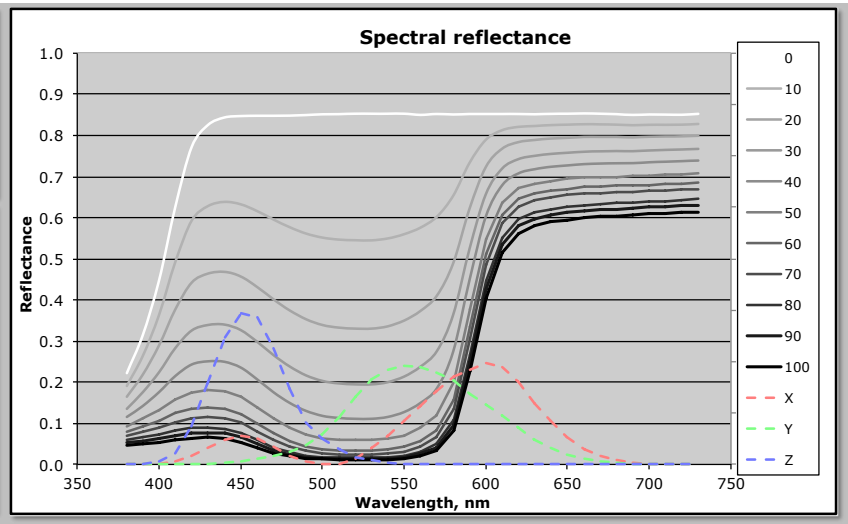
PMS186



Problem Defined

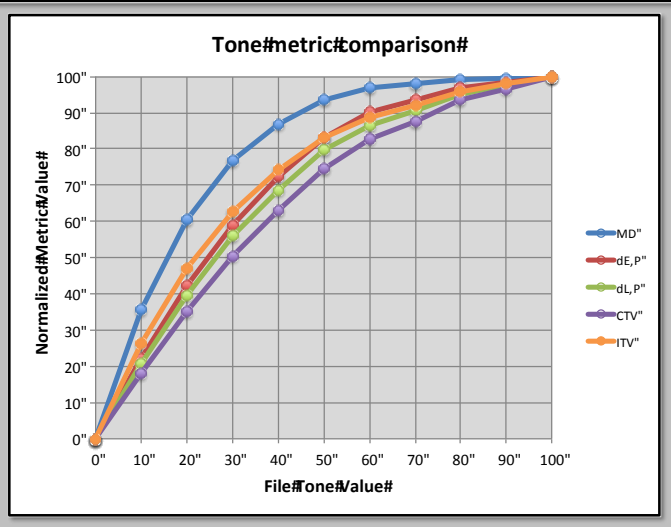






PMS186(

File TV	MD	dE-P	dL-P	CTV	ITV
0	0.0	0	0.0	0	0.0
10	35.4	22.2	20.8	18.0	26.1
20	60.6	42.4	39.8	35.2	46.9
30	76.7	58.9	55.9	50.4	62.9
40	86.9	72.2	68.7	63.0	74.1
50	93.5	83.2	79.7	74.7	83.3
60	96.7	90.0	86.6	82.7	88.7
70	98.1	93.5	90.5	87.5	91.9
80	99.2	96.7	95.2	93.4	95.9
90	99.6	98.4	97.4	96.5	97.9
100	100.0	100.0	100.0	100.0	100.0



ISO CD 20654

$$SCTV = 100\times \sqrt{\frac{(V_{xt}-V_{xp})^2+(V_{yt}-V_{yp})^2+(V_{zt}-V_{zp})^2}{(V_{xs}-V_{xp})^2+(V_{ys}-V_{yp})^2+(V_{zs}-V_{zp})^2}} \qquad \text{Equation 4.1}$$

where

V_{xs}, V_{ys}, V_{zs} *are* V_x, V_y, V_z values calculated for the spot ink solid,

V_{xp}, V_{yp}, V_{zp} *are* V_x, V_y, V_z values calculated for the substrate and

V_{xt}, V_{yt}, V_{zt} *are* V_x, V_y, V_z values calculated for the spot ink tint.

The value components are defined to have functional form similar to that of CIE L*:

$$V_x = f\left(\frac{X}{X_n}\right)\times 116 - 16$$

$$V_y = f\left(\frac{Y}{Y_n}\right)\times 116 - 16 \qquad \text{Equations 4.2}$$

$$V_z = f\left(\frac{Z}{Z_n}\right)\times 116 - 16$$

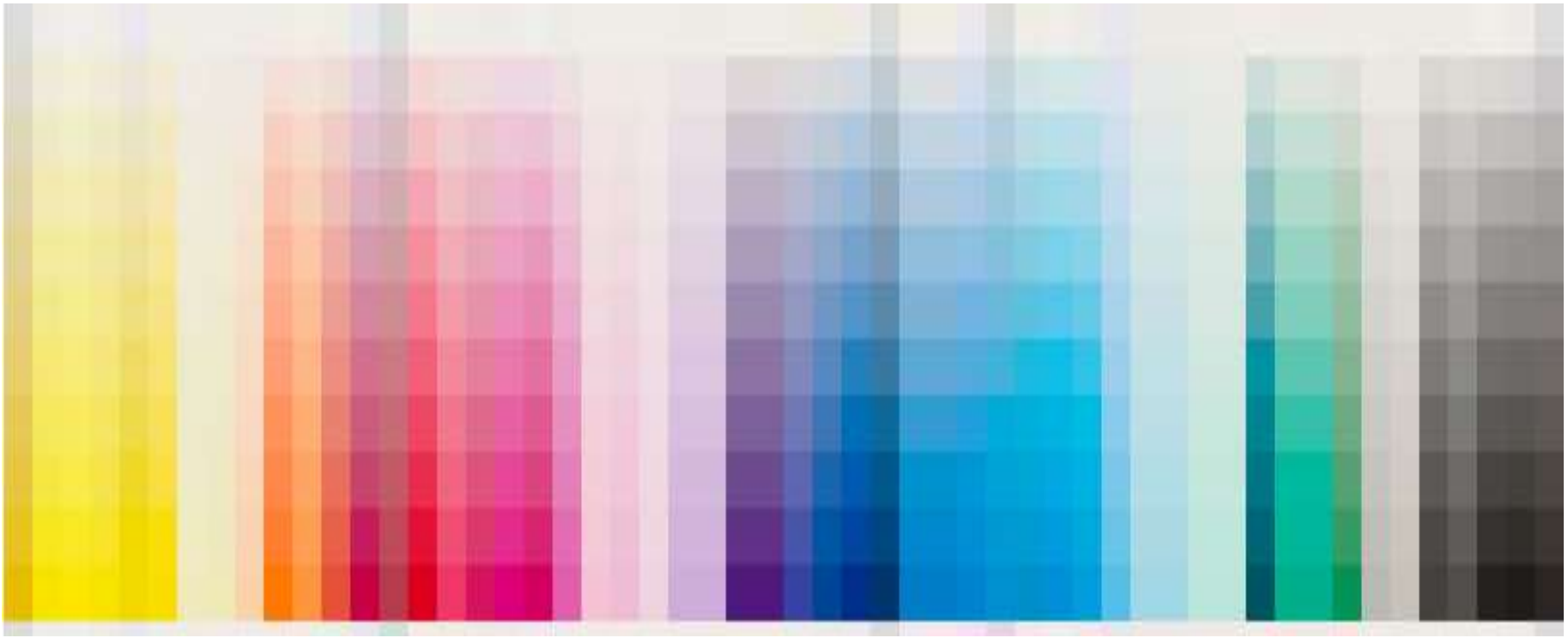
and where

$$f(u) = (u)^{\frac{1}{3}} \qquad \text{if } u > \left(\frac{6}{29}\right)^3 \qquad \text{Equations 4.3}$$

$$f(u) = \left(\frac{841}{108}\right)\cdot(u) + \left(\frac{4}{29}\right) \qquad \text{if } u \le \left(\frac{6}{29}\right)^3$$

is the same compression function defined in ISO 13655 in the derivation of CIELAB.

ISO CD 20654 – Spot Colour Tone Value (SCTV)



icc Max

- Provides Support for the Packaging Industry
- Allows measurement data using the CxF format
- New encoding of Named colors to support tints

Thanks for you time today!

Steve Smiley
SmileyColor & Associates LLC
www.smileycolor.com
steve@smileycolor.com
469-309-2025

SmileyColor is a Brand Management company, focusing across supply chains to improve communication through Standards and Process Control. Providing Brand Standards development, CxFX4 digital data and solution for implementation across brand workflow Design through Press. Providing consulting, press support and training and solutions to improve your Brand management definitions, recognition and consistency.
Representing you in ICC, FTA, NPES, CGATS, GWG, IDEAlliance Print Properties