

Standardization of Color Reproduction on Web Offset Printing and Graphic Arts Education

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1、Introduction

The world wide globalization in the graphic arts & printing market has added to **the price competition**. The competition is local and international from Asia.

Globalization lowers the price of paper & ink, **which affects printing costs**. The rise of China doesn't affect printers in the time-sensitive niches, such as publication and time-dated catalogue, but it is having a considerable impact in **the book and some commercial print markets**. So, the **Web Offset Printing & Education** plays in important part of Print Quality for the growth of the Printing Industry.

2、 Purpose

The commercial catalogue had been printed by web offset press (KOMORI System 38) with the reformed excellent ink (Daihan Ink) in Doosan Dong-A Ltd.,(South Korea).

The color reproduction of the printed image was evaluated ;

(1)Japan Color Web 2003

(2)Japan color Sheet Fed 2001

(3)D-Standard Sheet Fed data

(4)And so on

3、Abstract

- 1、Web 38 data that performed at 21,May in Doosan Dong-A Ltd., expands Yellow & Red area in color gamut more than Japan Color Web 2003 .
- 2、Web 38 Printed Image is superior in Japan Color 2007 of the offset sheet fed image.
- 3、The good reason is reformed on the reformed excellent printing ink & printing paper in web materials.

4、Experimental

- 1, Printing Ink; Daihan Ink (South Korea)
- 2, Printing Paper; Coated Paper
- 3, Printing Press; KOMORI System 38
- 4, Printing Speed; 54,000 Sheets/H
- 5, Test Chart; DOOSAN Test FORM(1617 Colors)
& Commercial Catalogue
- 6, Measurement; DTP70 (X-rite)

Offset Web Press(4 × 4Colors)

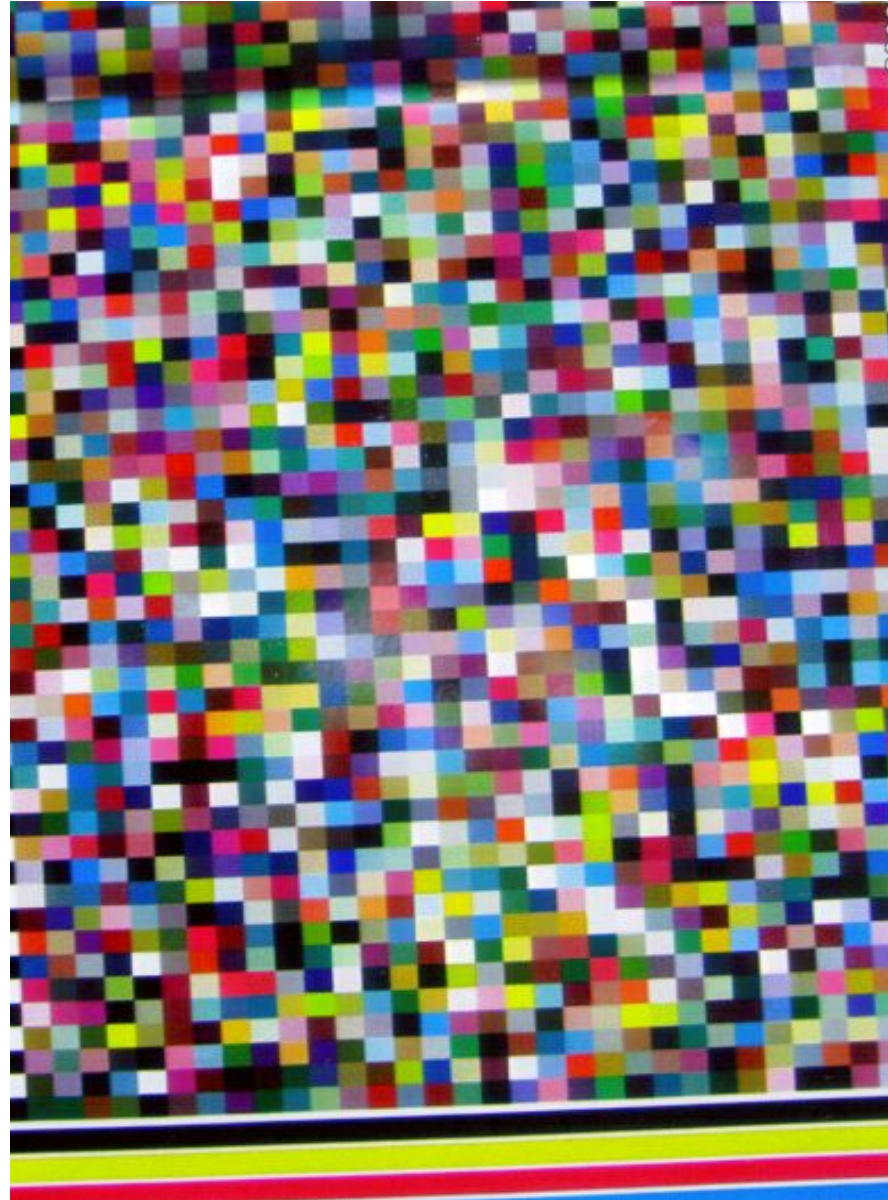
Komori System 38S



Test Form



1617 Colors



5、 Results & Discussion

- 1、 D-Web Offset & Japan Color Web 2003
- 2、 D-Web Offset & D-Web Offset 300,1000rpm
- 3、 D Web Offset & JCW2003, JCP2007, JCP2001,
Nova Space, D-High Density and D-Standard(SF)
- 4、 Evaluation of Test Chart by Colorimetry &
Density

Simplified Word used in the Paper

Terminology		
No.	Simplified	Technical Term
1	JCP	Japan Color Print
2	ΔE	Color Difference
3	L*	Lightness
4	c*	Ghroma
5	HA	Hue Angle
6	γ	Correlation
7	rpm	Revolution/Minute
8	D-	Doosan Dong-A Ltd.
9	CMY	Primary Colors
10	RGB	Secondary Colors

Web Offset Printing Data 1617 Colors obtained by DTP 70

No.	C	M	Y	K	X	Y	Z	L*	a*	b*	Dr	Dg	Db	Dvis
1	0	0	0	0	82.37	85.73	71.82	94.2	-0.56	-0.96	0.071	0.0638	0.064	0.0679
2	0	10	0	0	72.37	72.28	62.4	88.1	5.67	-2.72	0.108	0.1507	0.126	0.1372
3	0	20	0	0	67.61	64.19	56.39	84.07	12.88	-3.63	0.117	0.2204	0.171	0.1821
4	0	30	0	0	62.27	56.3	50.41	79.78	19.32	-4.56	0.133	0.2954	0.221	0.2326
5	0	40	0	0	53.98	46.28	42.39	73.73	25.34	-5.48	0.178	0.4029	0.298	0.3103
6	0	55	0	0	47.26	36.14	33.63	66.63	38.09	-5.82	0.202	0.57	0.402	0.3998
7	0	70	0	0	40.48	27.19	25.36	59.15	50.5	-5.4	0.239	0.7853	0.528	0.5011
8	0	85	0	0	34.74	19.75	18.12	51.55	64.59	-4.19	0.274	1.1099	0.682	0.6081
9	0	100	0	0	30.95	15.59	14.13	46.44	73.23	-3.42	0.305	1.4745	0.795	0.6858

1610	70	70	70	10	8.63	8.54	4.56	35.09	3.48	11.89	0.938	1.0374	1.233	1.0576
1611	50	40	40	0	22.71	23.84	18	55.92	-1.25	3.61	0.582	0.5825	0.654	0.6255
1612	100	0	0	10	13.57	19.89	43.27	51.71	-31.8	-44.54	1.368	0.5036	0.284	0.8044
1613	0	100	0	10	25.48	13.07	12.36	42.88	67.07	-4.69	0.391	1.5028	0.852	0.7671
1614	0	0	100	10	53.09	57.57	4.94	80.5	-6.13	88.16	0.193	0.2537	1.152	0.2217
1615	0	100	100	10	24.08	12.88	1.77	42.58	62.36	45.41	0.381	1.4993	1.644	0.7633
1616	100	0	100	10	6.51	14.83	4.99	45.4	-61.1	27.37	1.405	0.597	1.141	0.9029
1617	100	100	0	10	4.57	3.2	12.39	20.82	22.24	-42.82	1.435	1.5047	0.849	1.531

Web Offset Data from 1617 Colors of Test Form

No.	C	M	Y	K	DoosanWeb	L*	a*	b*	c*
73	100	0	0	0	C	55.34	-33.46	-48.32	58.77
9	0	100	0	0	M	46.44	73.23	-3.42	73.31
649	0	0	100	0	Y	87.76	-6.31	94.26	94.47
81	100	100	0	0	B	22.76	23.66	-45.8	51.55
721	100	0	100	0	G	49.57	-65.65	30.09	72.22
657	0	100	100	0	R	46.04	67.89	50.42	84.56

Comparison of Web Offset & Japan Color Web 2003

DoosanWeb				
	L*	a*	b*	c*
C	55.34	-33.46	-48.32	58.77
M	46.44	73.23	-3.42	73.31
Y	87.76	-6.31	94.26	94.47
R	46.04	67.89	50.42	84.56
G	49.57	-65.65	30.09	72.22
B	22.76	23.66	-45.8	51.55
	L*	a*	b*	c*
C	52.25	-35.78	-48.49	60.26
M	46.69	74.6	-3.32	74.67
Y	86.88	-5.43	88.78	88.95
R	46.64	69.06	45.78	82.86
G	47.18	-68.21	24.28	72.40
B	21.09	20.65	-47.33	51.64
JCWeb2003				

Fig1 Color Gamut of **Web Offset** & **JC Web 2003**

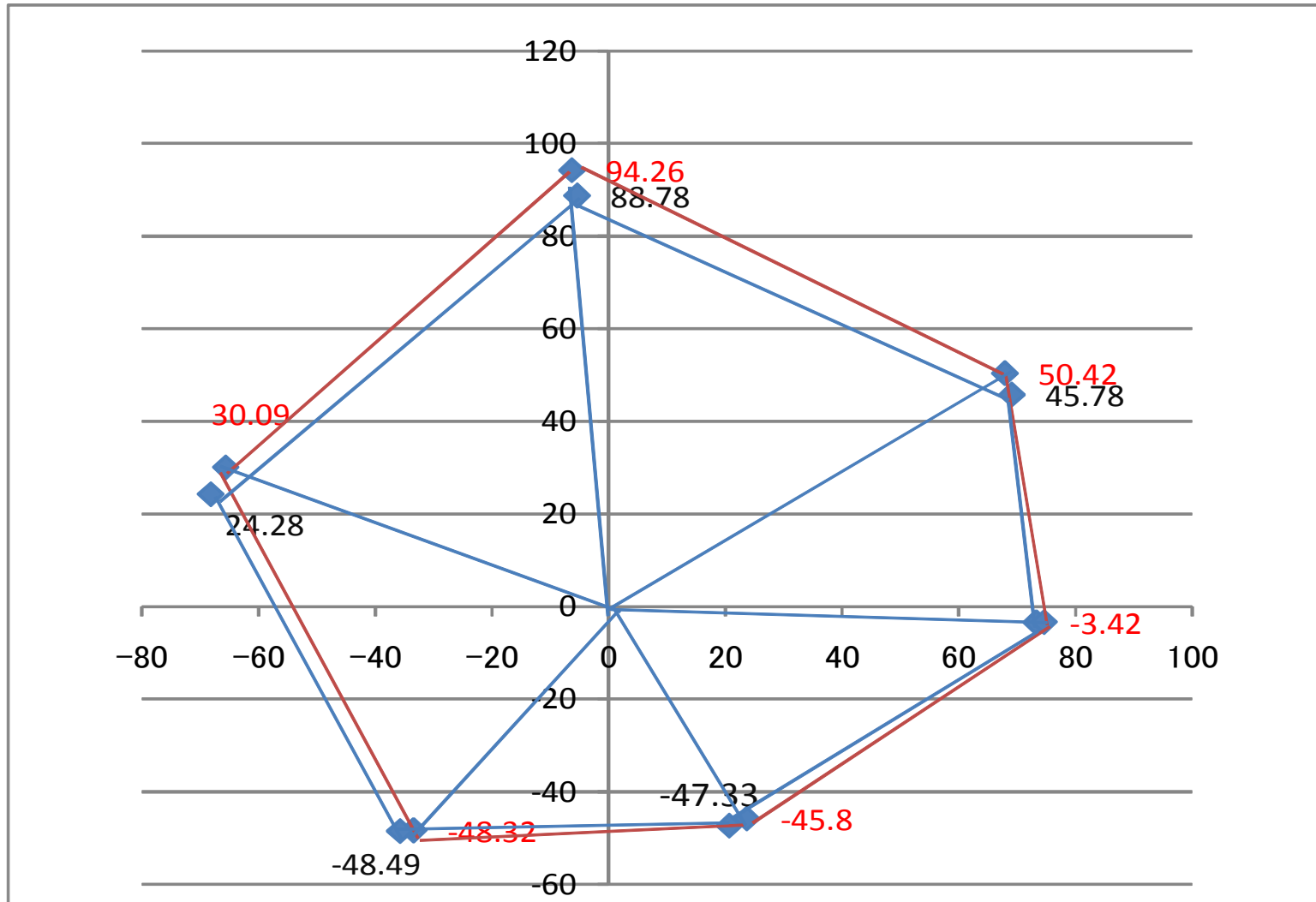


Fig2 Factor of c^* , HA & L^* on Color Difference (ΔE) for Web Offset & JC Web 2003

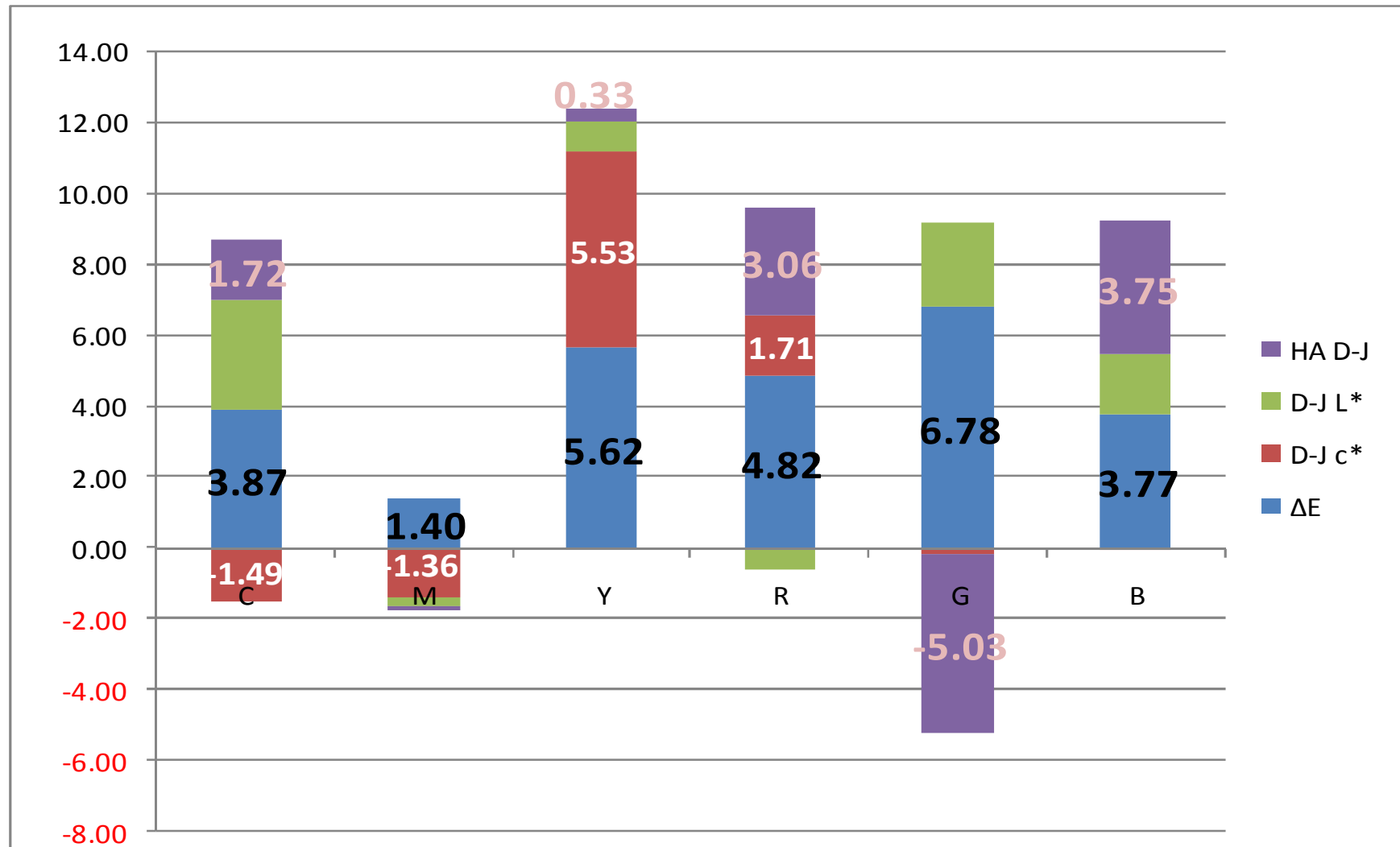


Table 1 HA(Hue Angle)for **D Web Offset** &
JC Web 2003

Color	D	J	HA D-J
C	235.33	233.60	1.72
M	357.32	357.45	-0.13
Y	93.79	93.46	0.33
R	216.62	213.56	3.06
G	155.36	160.40	-5.03
B	297.29	293.54	3.75

Absolute Value and γ Value for ΔE of Web Offset & JC Web 2003

Color	ΔE	D-J c*	D-J L*	HA D-J	Ab. Value
C	3.87	-1.49	3.09	1.72	6.30
M	1.40	-1.36	-0.25	-0.13	1.74
Y	5.62	5.53	0.88	0.33	6.74
R	4.82	1.71	-0.60	3.06	5.37
G	6.78	-0.19	2.39	-5.03	7.61
B	3.77	-0.09	1.67	3.75	5.51
	$\gamma =$	0.4955		$\gamma =$	0.9222

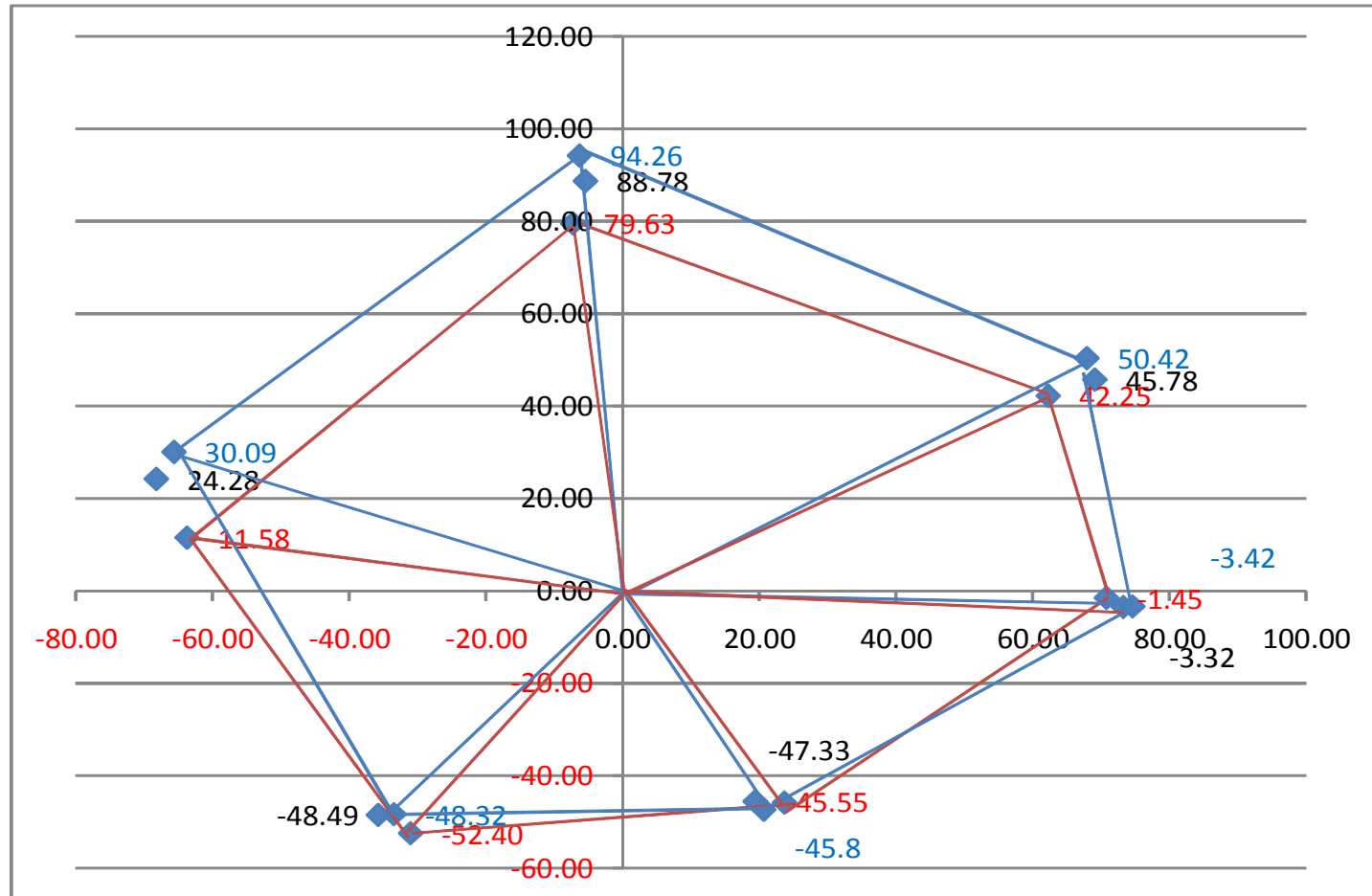
Table2 Absolute Value Ratio for ΔE of
Web Offset & JC Web 2003

Color	ΔE	D-J c*	D-J L*	HA D-J	Ab. Value
C	3.87	24%	49%	27%	6.30
M	1.40	78%	14%	7%	1.74
Y	5.62	82%	13%	5%	6.74
R	4.82	32%	11%	57%	5.37
G	6.78	3%	31%	66%	7.61
B	3.77	2%	30%	68%	5.51

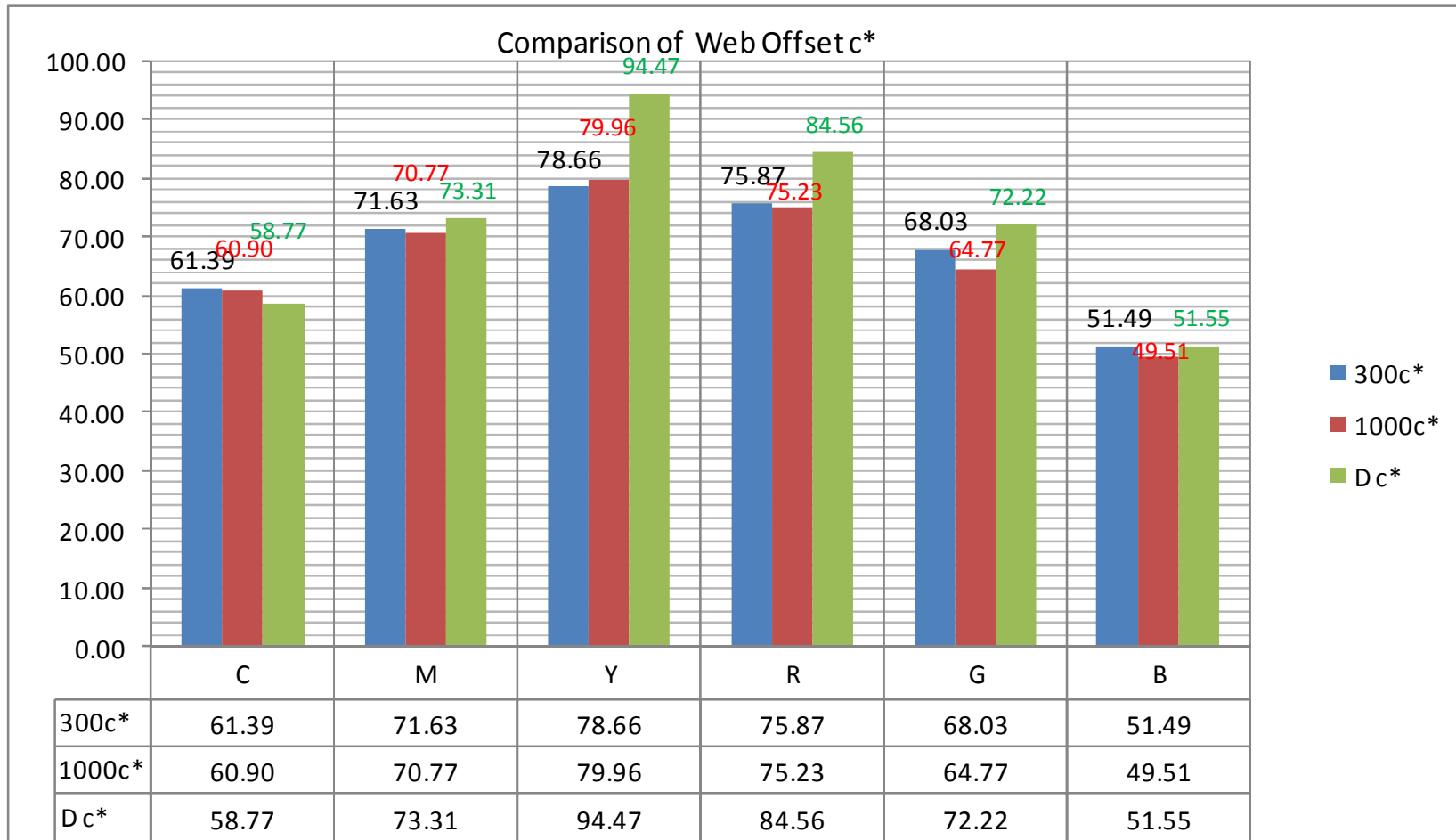
Comparison for present data of D Web Offset and Introducing Test of 2007 in 300 & 1000 rpm

300rpm	L	a	b	300c*	Doosan- ΔE	c* D-
C	48.66	-31.29	-52.82	61.39	8.3	-2.6
M	43.04	71.60	-2.16	71.63	4.0	1.7
Y	83.42	-7.39	78.31	78.66	16.6	15.8
R	43.64	63.58	41.40	75.87	10.3	8.7
G	43.80	-66.94	12.14	68.03	18.9	4.2
B	19.01	19.47	-47.67	51.49	5.9	0.1
1000rpm	L	a	b	1000c*		
C	48.18	-31.04	-52.40	60.90	8.6	-2.1
M	43.01	70.76	-1.45	70.77	4.7	2.5
Y	83.57	-7.29	79.63	79.96	15.2	14.5
R	44.24	62.24	42.25	75.23	10.1	9.3
G	44.59	-63.73	11.58	64.77	19.3	7.4
B	19.98	19.39	-45.55	49.51	5.1	2.0
Doosan	L*	a*	b*	c*		
C	55.34	-33.46	-48.32	58.77	0.0	0.0
M	46.44	73.23	-3.42	73.31	0.0	0.0
Y	87.76	-6.31	94.26	94.47	0.0	0.0
R	46.04	67.89	50.42	84.56	0.0	0.0
G	49.57	-65.65	30.09	72.22	0.0	0.0
B	22.76	23.66	-45.8	51.55	0.0	0.0

Color Gamut in Comparison for present data of D Web Offset2009 & 2007 Test (1000 rpm)



Comparison of c* in 2007 (300,1000rpm) & 2009 of Web Offset



Difference of D c* of 2007 (300,1000 rpm) & 2009 Test

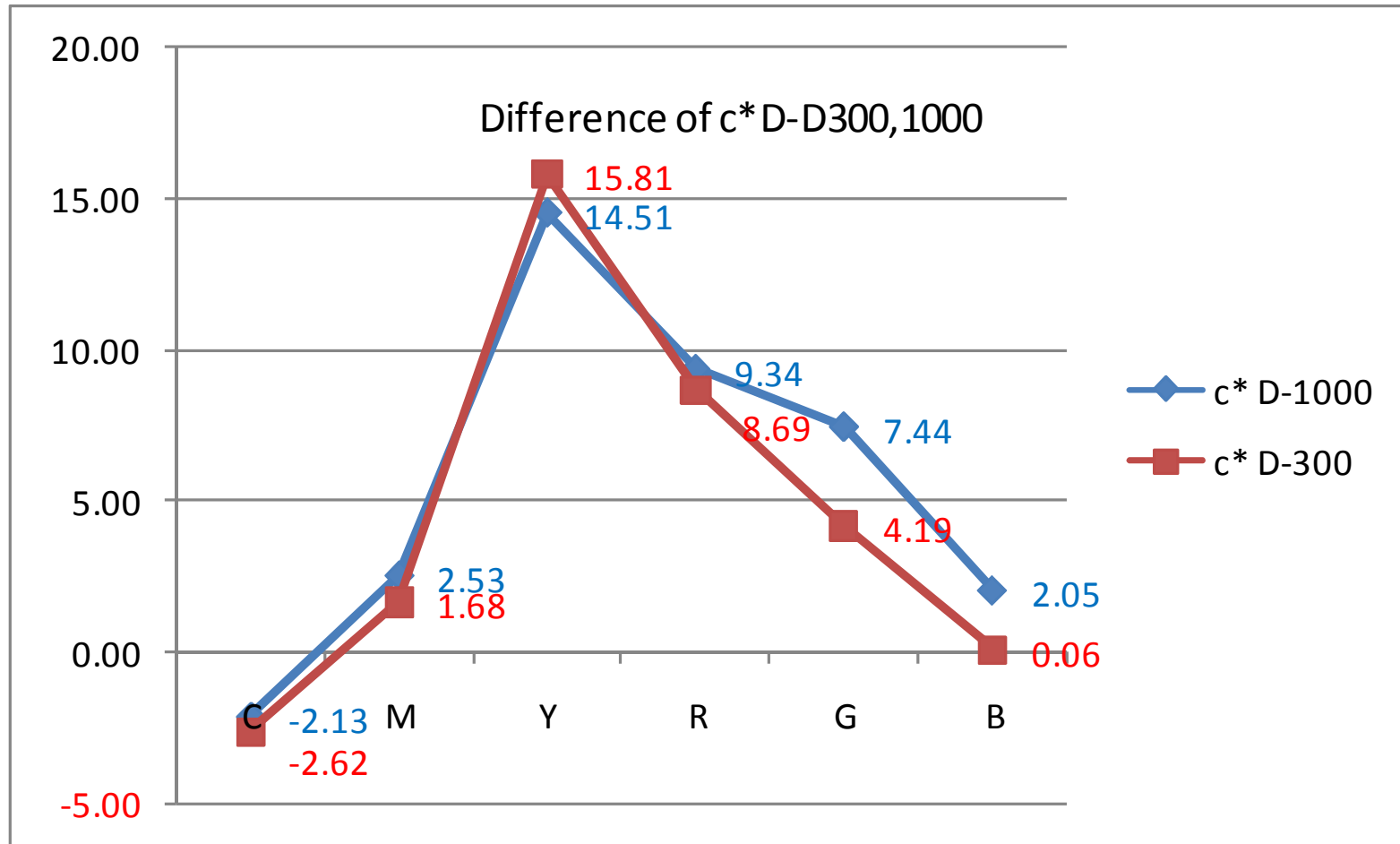
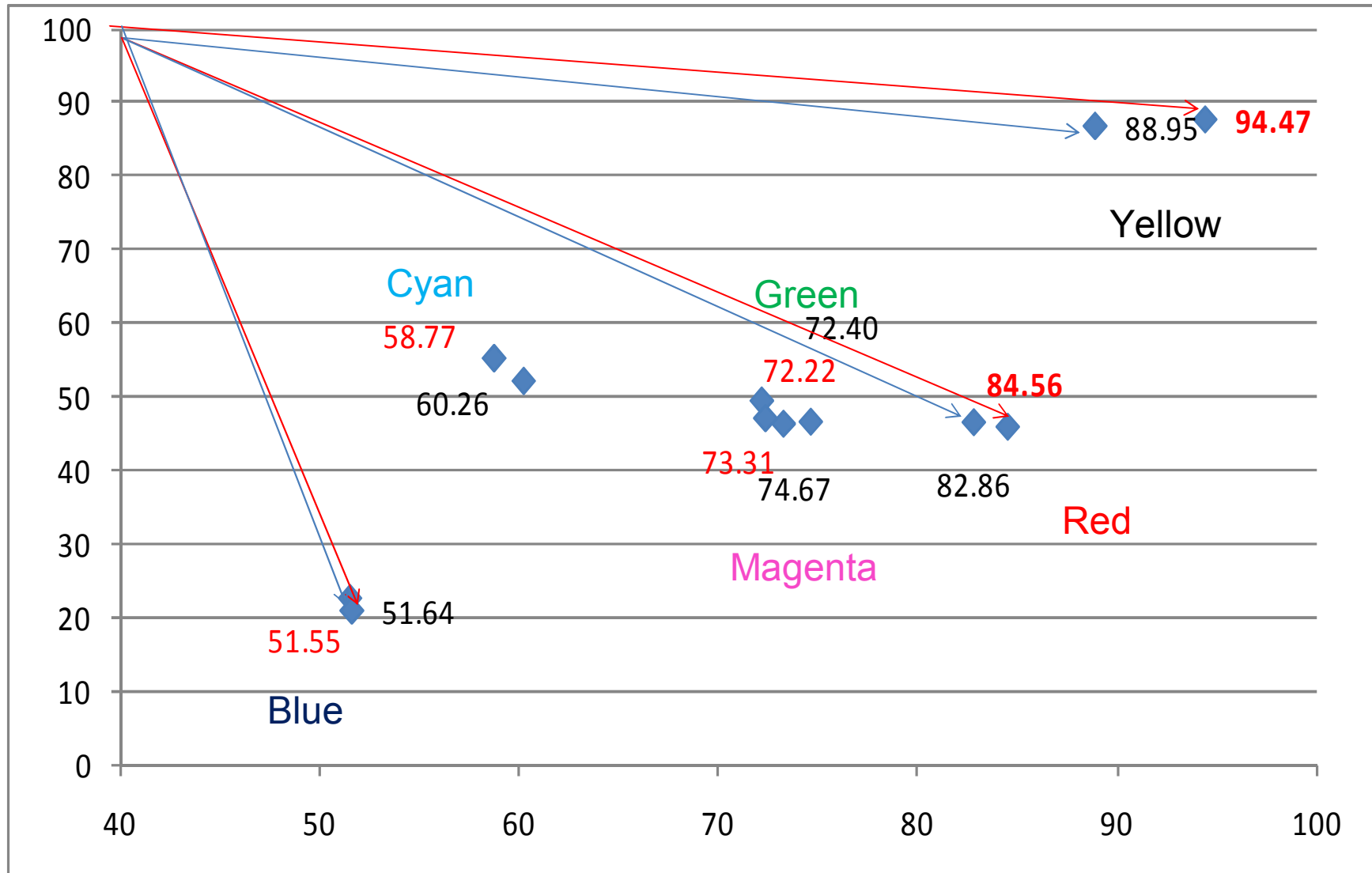
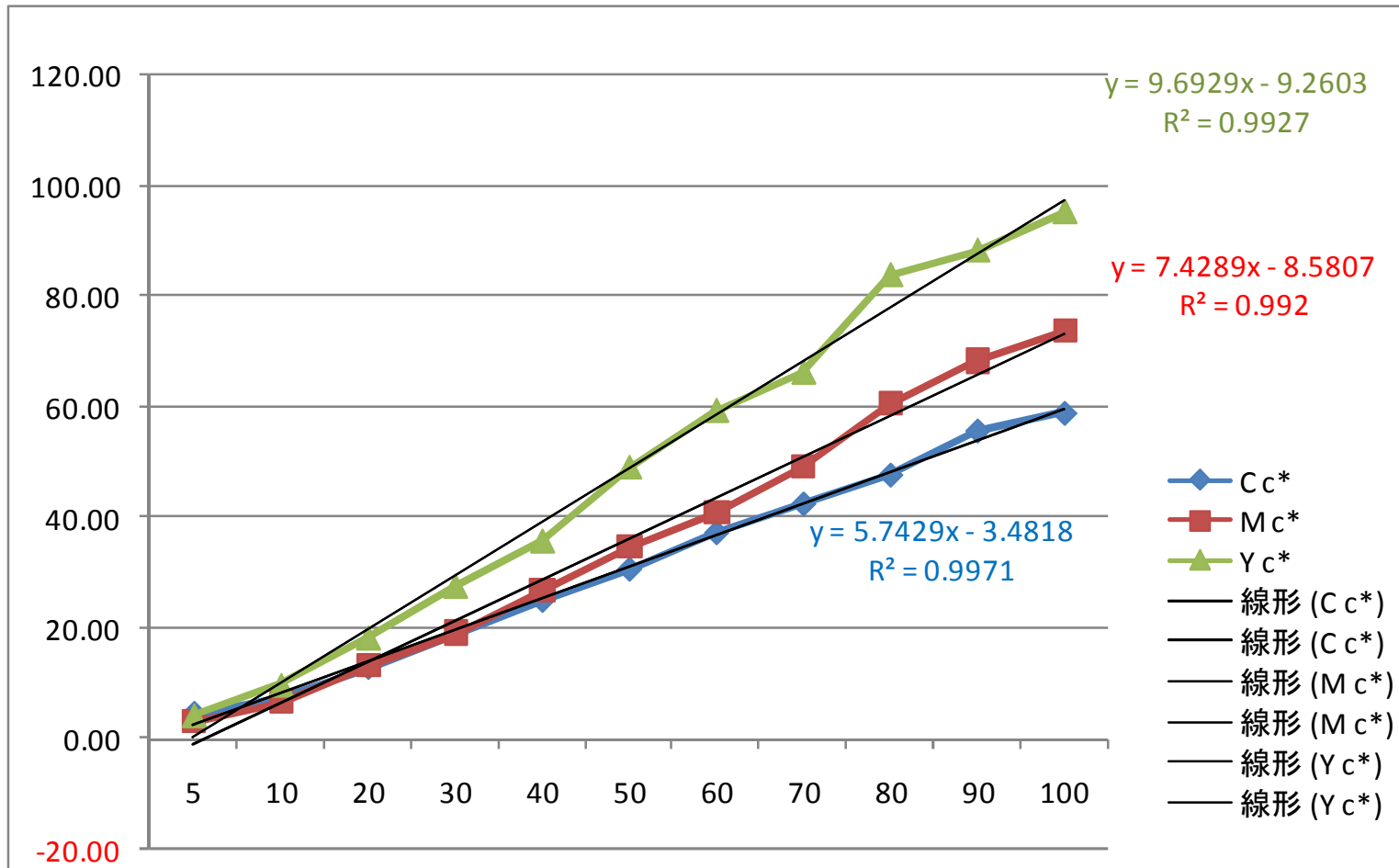


Chart of c^* & L^* in Doosan Web Offset & JC Web



Chroma (c*) Reproduction by Halftone Dot of D Test(2009)



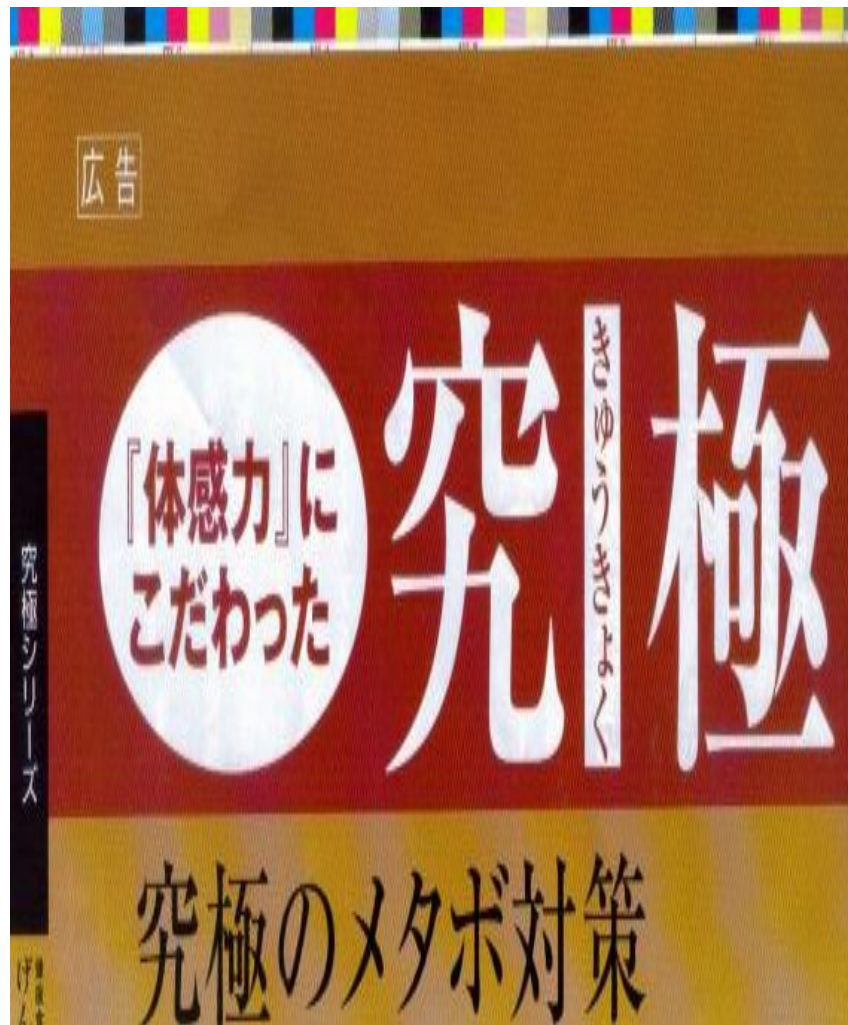
The front side of Web Offset Image



The back side of Web Offset Image



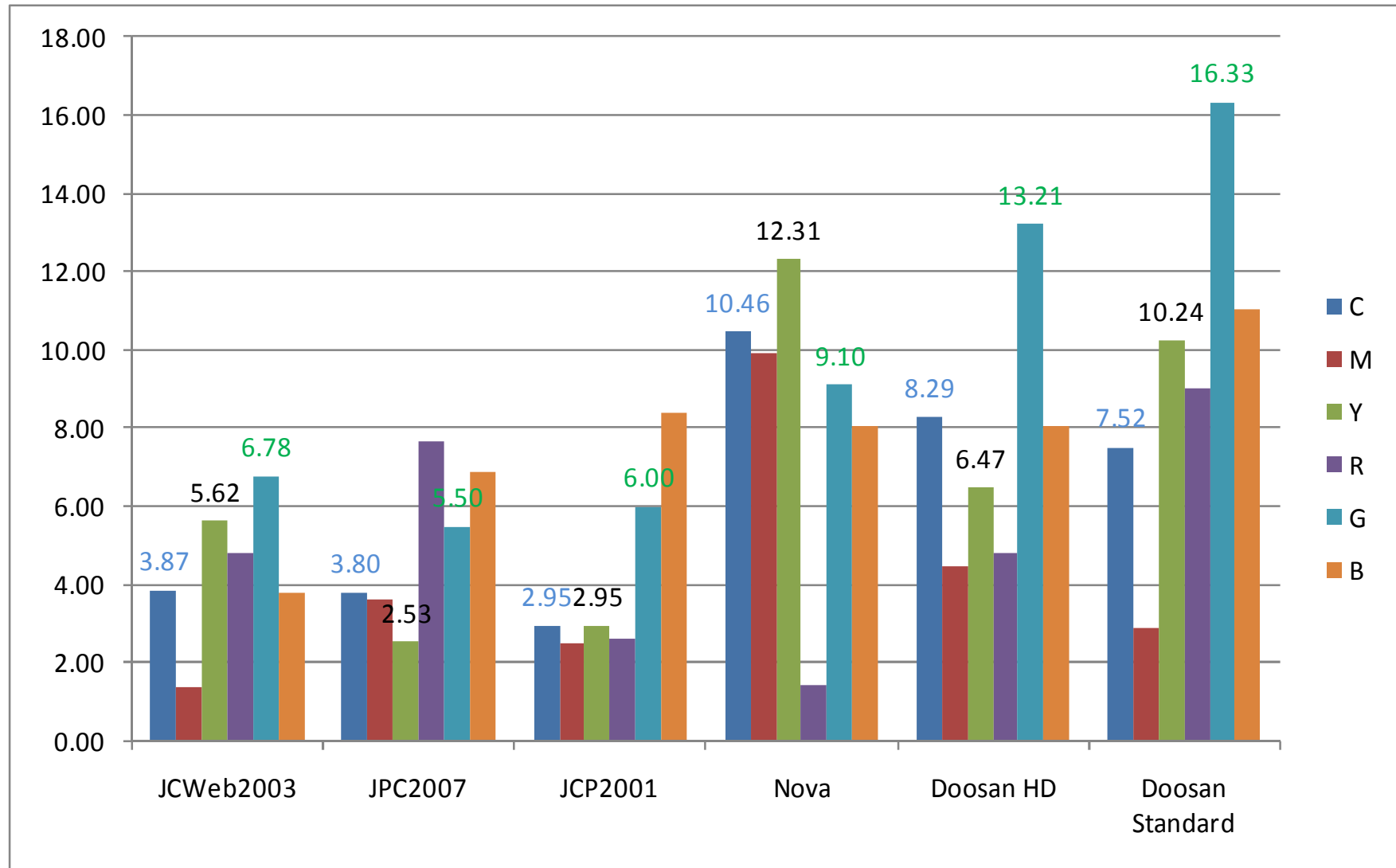
A Parts of Web Offset Images



Comparison in ΔE , c^* of Web Offset & Japan Color Web 2003, JCP2007, JCP2001, Nova Space , D-High Density and D-Standard

ΔE D-	JCWeb2003	JPC2007	JCP2001	Nova	Doosan HD	Doosan Standard	Ave
C	3.87	3.80	2.95	10.46	8.29	7.52	6.15
M	1.40	3.61	2.47	9.89	4.47	2.89	4.12
Y	5.62	2.53	2.95	12.31	6.47	10.24	6.69
R	4.82	7.66	2.58	1.44	4.78	9.02	5.05
G	6.78	5.50	6.00	9.10	13.21	16.33	9.49
B	3.77	6.88	8.39	8.06	8.06	11.04	7.70
Ave	4.38	5.00	4.22	8.55	7.55	9.51	6.53
c^* D-	JCWeb2003	JPC2007	JCP2001	Nova	Doosan HD	Doosan Standard	Ave
C	-1.49	-1.83	-2.03	-3.49	-5.31	-5.27	-3.24
M	-1.36	-0.03	1.14	-5.16	-1.49	-0.95	-1.31
Y	5.53	1.34	2.21	-11.39	5.51	9.97	2.19
R	1.71	5.79	2.36	-0.58	2.88	5.21	2.90
G	-0.19	0.71	-2.46	-2.03	3.81	5.43	0.88
B	-0.09	1.57	0.00	-7.64	-4.06	-0.29	-1.75
Ave	0.68	1.26	0.20	-5.05	0.22	2.35	-0.05

Comparison in ΔE of Web Offset & Japan Color Web 2003, JCP2007, JCP2001, Nova Space , D-High Density and D-Standard



Comparison in c* of Web Offset & Japan Color Web 2003, JCP2007, JCP2001, Nova Space , D-High Density and D-Standard

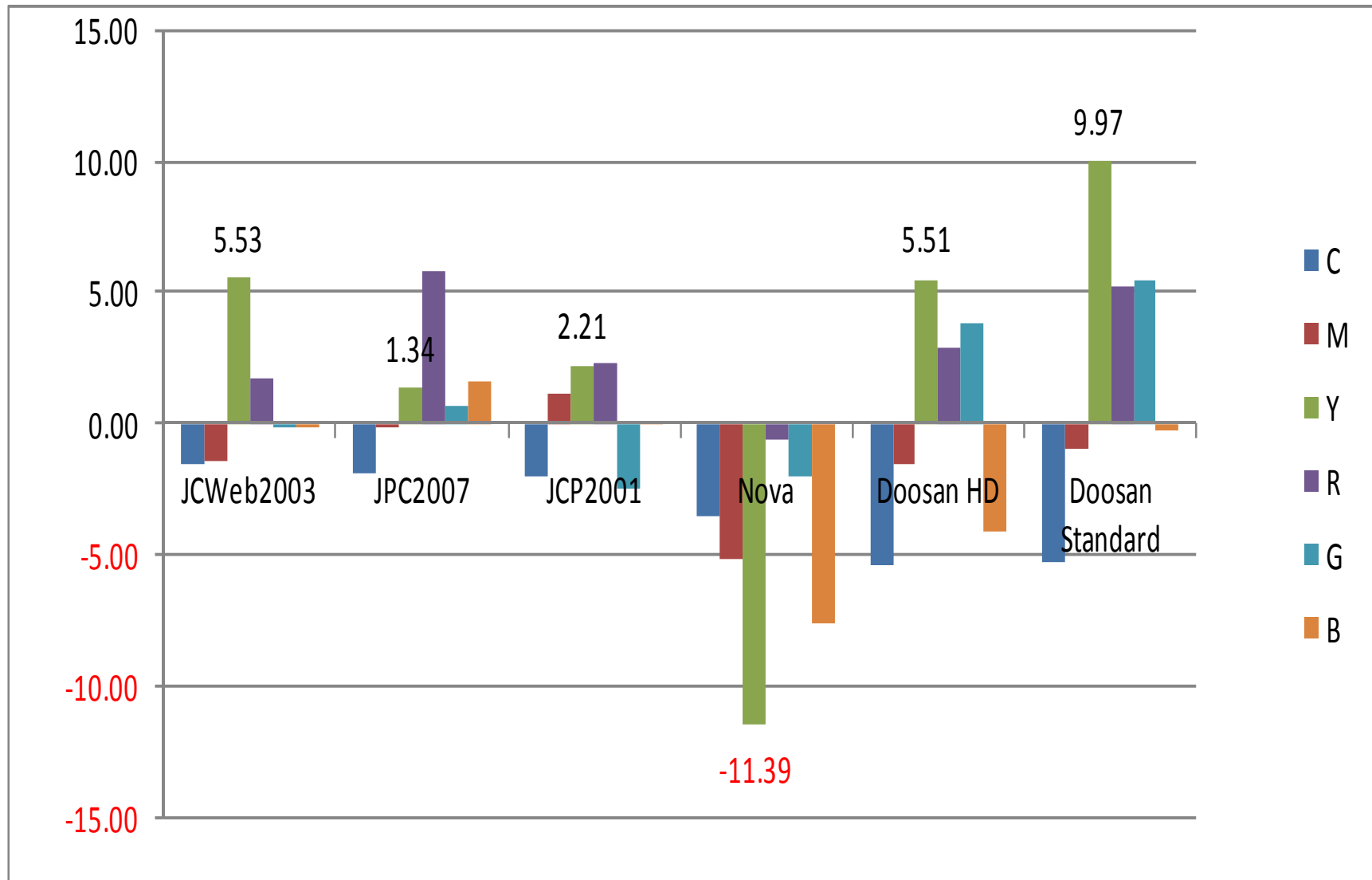


Table3 Data of Soy Sheet Fed (Korean Special Ink) & Web Offset (Daihan Ink)

	Sheet Fed				Doosan Web			
Color	L	a	b	c*	L*	a*	b*	c*
C	52.94	-34.79	-50.51	61.33	55.34	-33.46	-48.32	58.77
M	45.3	73.66	-2.94	73.72	46.44	73.23	-3.42	73.31
Y	87.33	-8.33	86.86	87.26	87.76	-6.31	94.26	94.47
R	44.8	66.85	41.04	78.44	46.04	67.89	50.42	84.56
G	48.25	-66.78	19.29	69.51	49.57	-65.65	30.09	72.22
B	21.77	19.84	-46.54	50.59	22.76	23.66	-45.8	51.55
3K	21.62	-3.08	-5.77	6.54	22.4	-2.23	2	3.00

Color Gamut of Sheet Fed & Web Offset

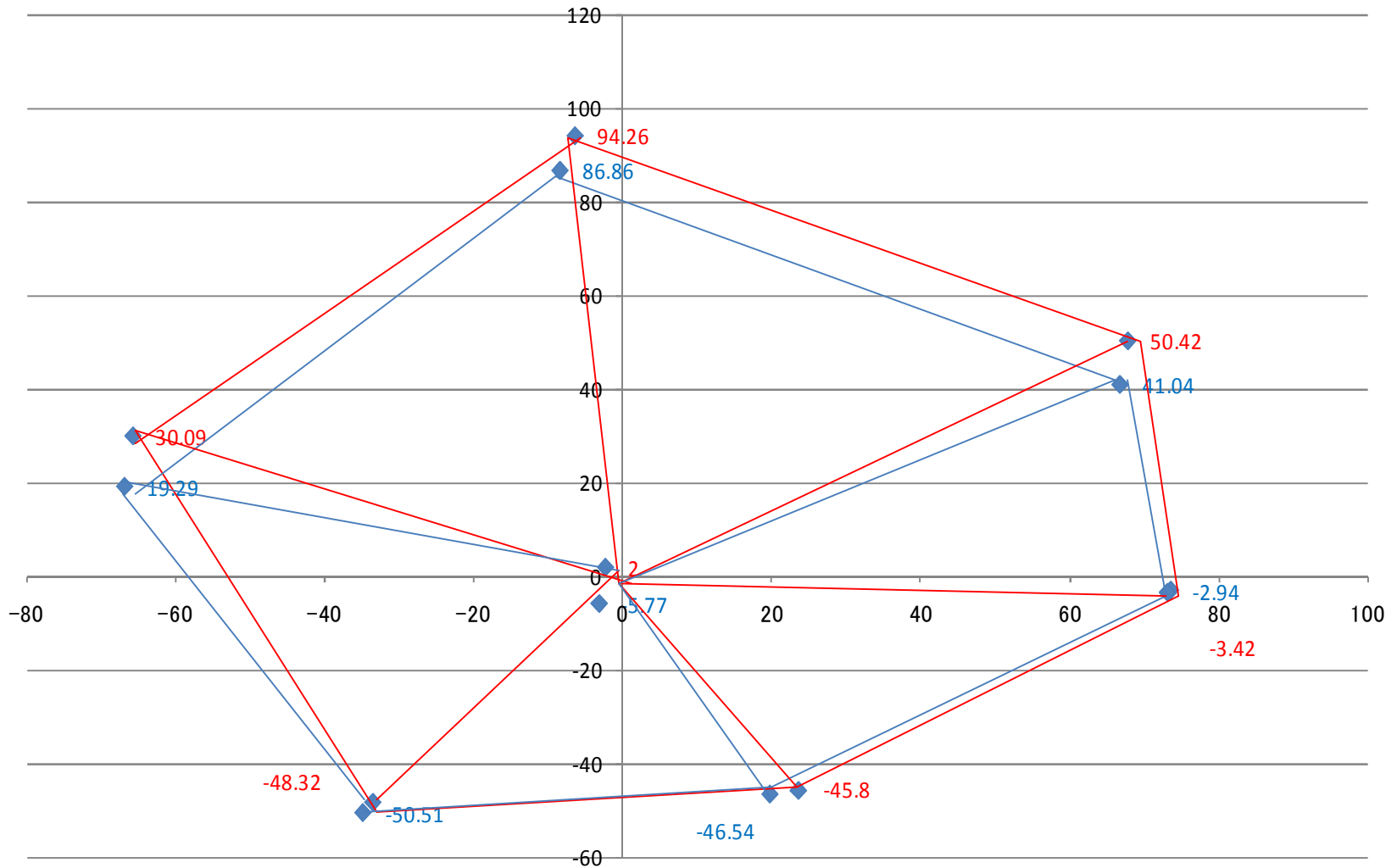
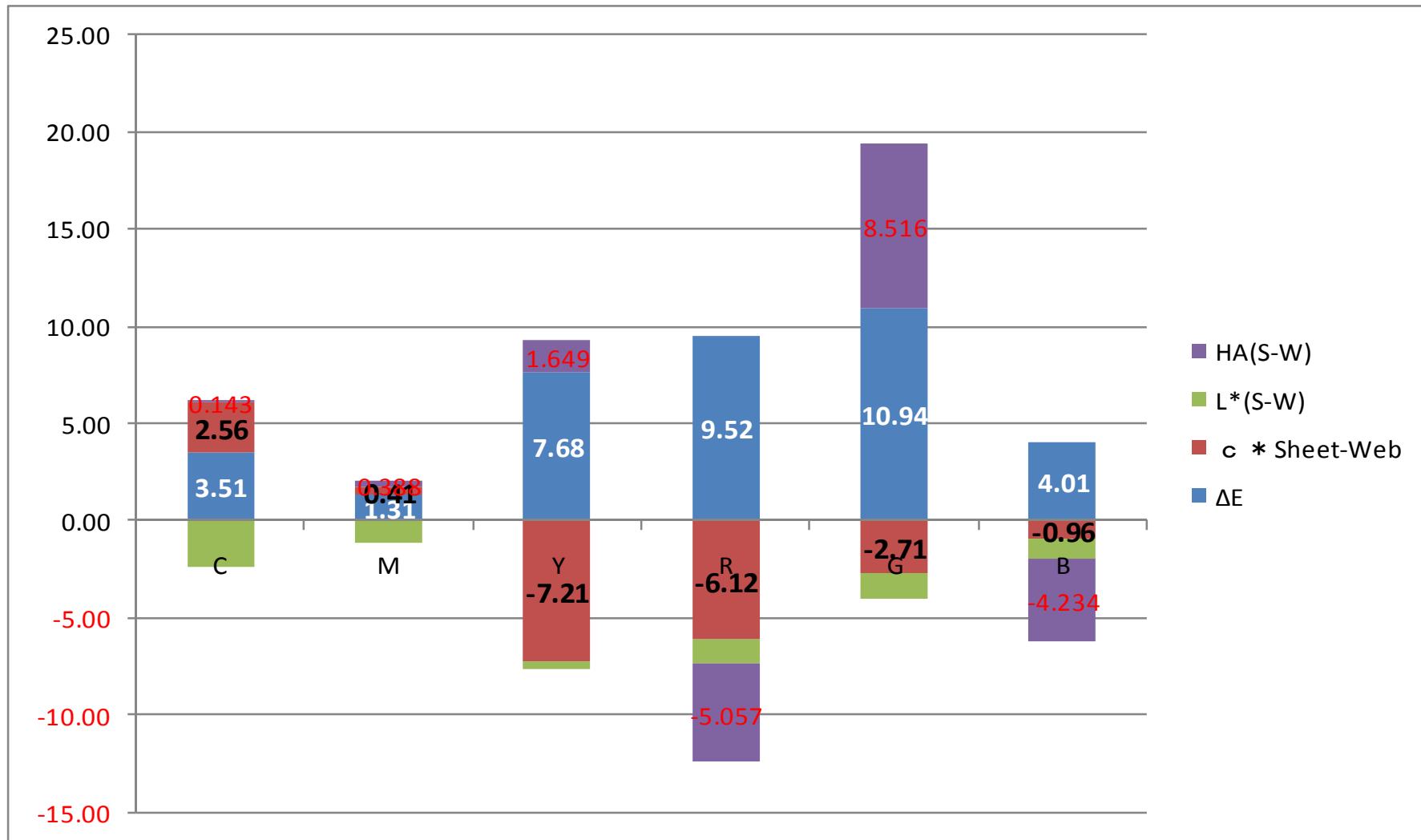


Table4 ΔE & c^* , L^* , HA in Difference (S-W) of Soy Sheet Fed (Korean Special Ink) & Web Offset (Daihan Ink)

Color	ΔE	c^* Sheet-We	$L^*(S-W)$	HA(S-W)
C	3.51	2.56	-2.4	0.143
M	1.31	0.41	-1.14	0.388
Y	7.68	-7.21	-0.43	1.649
R	9.52	-6.12	-1.24	-5.057
G	10.94	-2.71	-1.32	8.516
B	4.01	-0.96	-0.99	-4.234

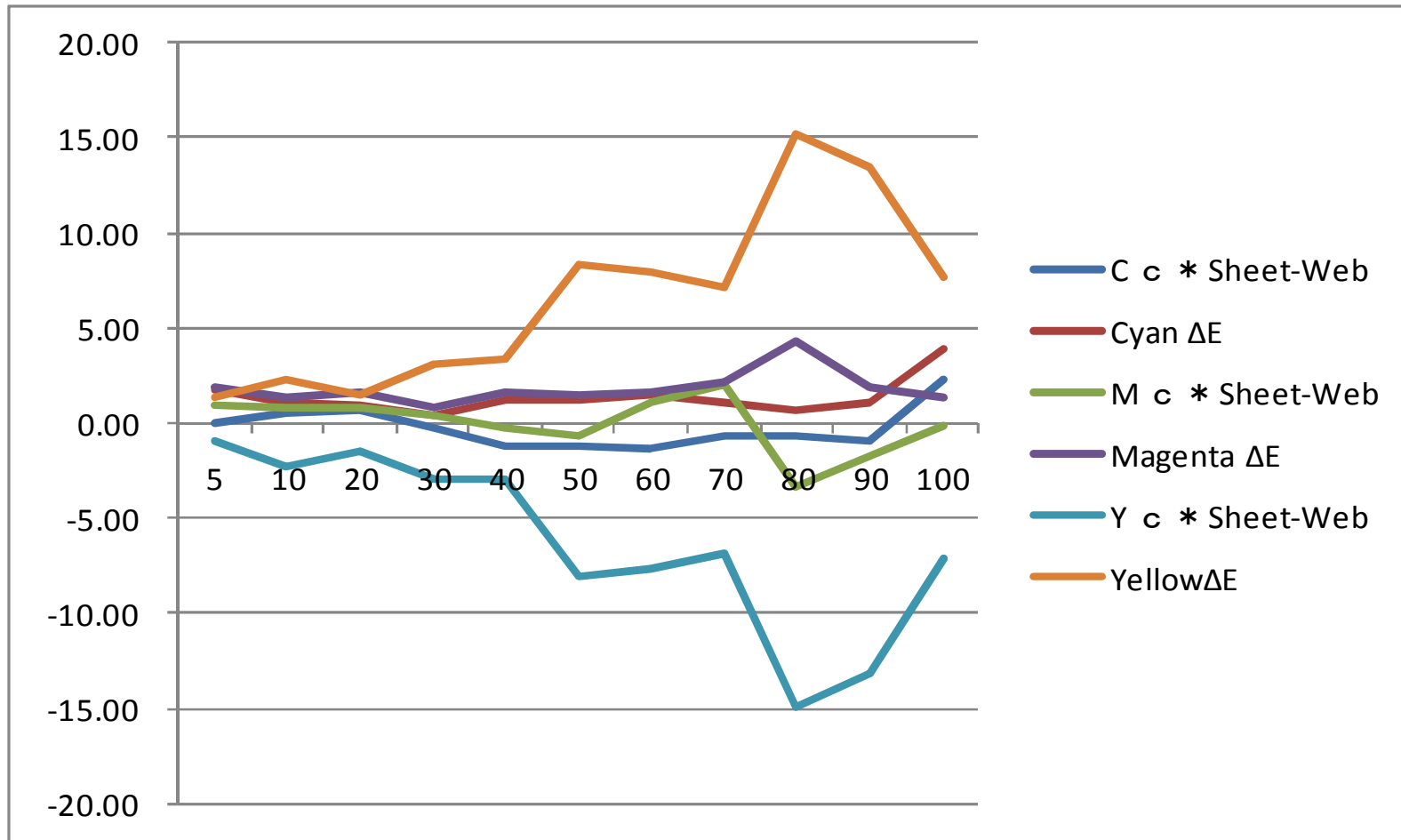
ΔE & (Sheet-Web) c^* , L^* , H_A



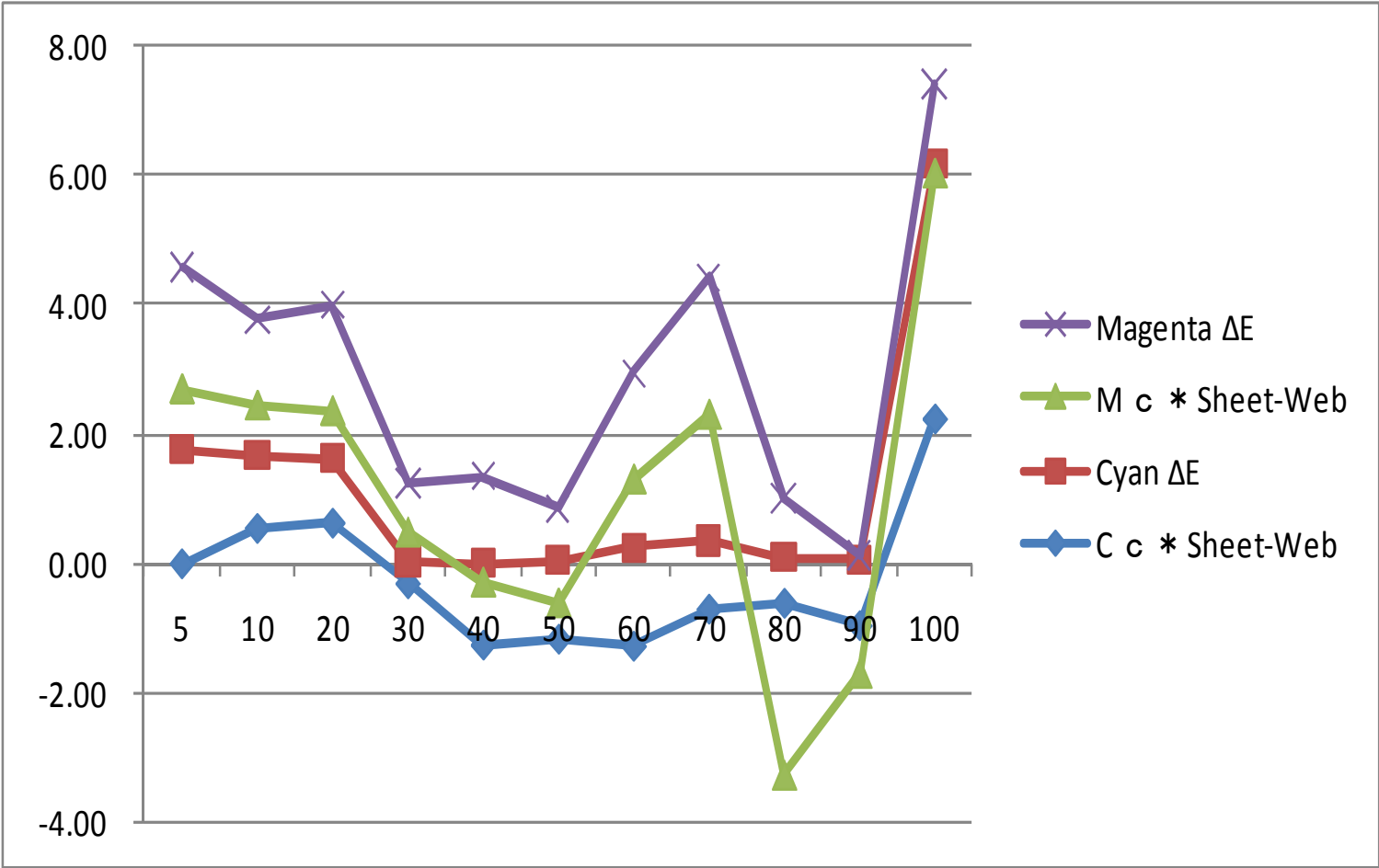
Δ E & (S-W)c* in Dot %(5 ~ 100%) of C,M,Y

Dot%	C c* Sheet-Web	Cyan ΔE	M c* Sheet-Web	Magenta ΔE	Y c* Sheet-Web	Yellow ΔE
5	-0.01	1.77	0.94	1.89	-0.90	1.40
10	0.54	1.13	0.77	1.33	-2.24	2.30
20	0.62	0.99	0.74	1.63	-1.45	1.49
30	-0.32	0.34	0.46	0.75	-3.01	3.07
40	-1.27	1.27	-0.29	1.63	-2.92	3.31
50	-1.18	1.21	-0.65	1.45	-8.06	8.28
60	-1.29	1.53	1.06	1.64	-7.72	7.90
70	-0.71	1.06	1.95	2.12	-6.90	7.10
80	-0.62	0.72	-3.37	4.27	-14.90	15.23
90	-0.97	1.03	-1.76	1.82	-13.21	13.48
100	2.24	3.93	-0.15	1.39	-7.18	7.73

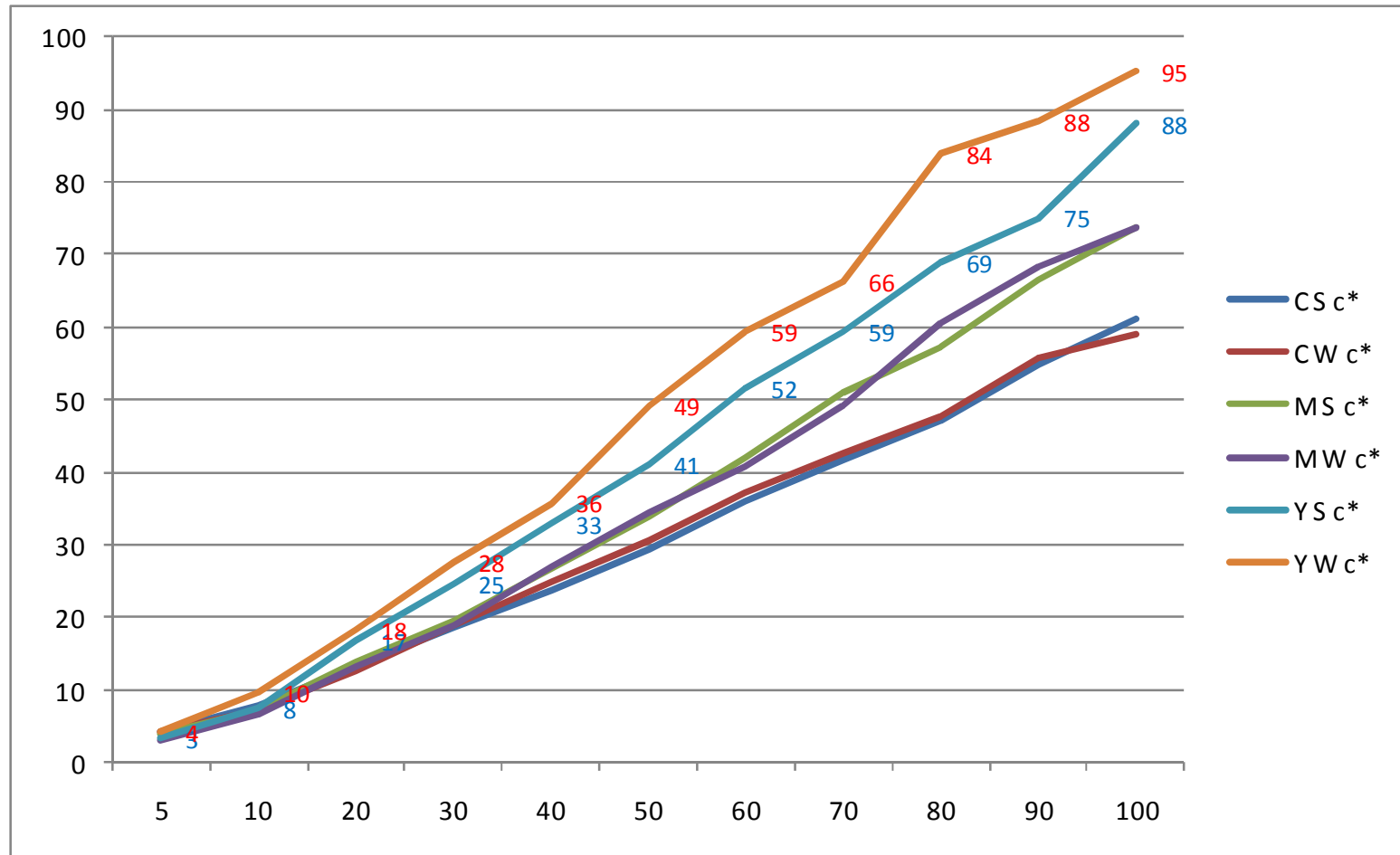
Graph for ΔE & (S-W)c* in Dot %(5 ~ 100%) of C,M,Y



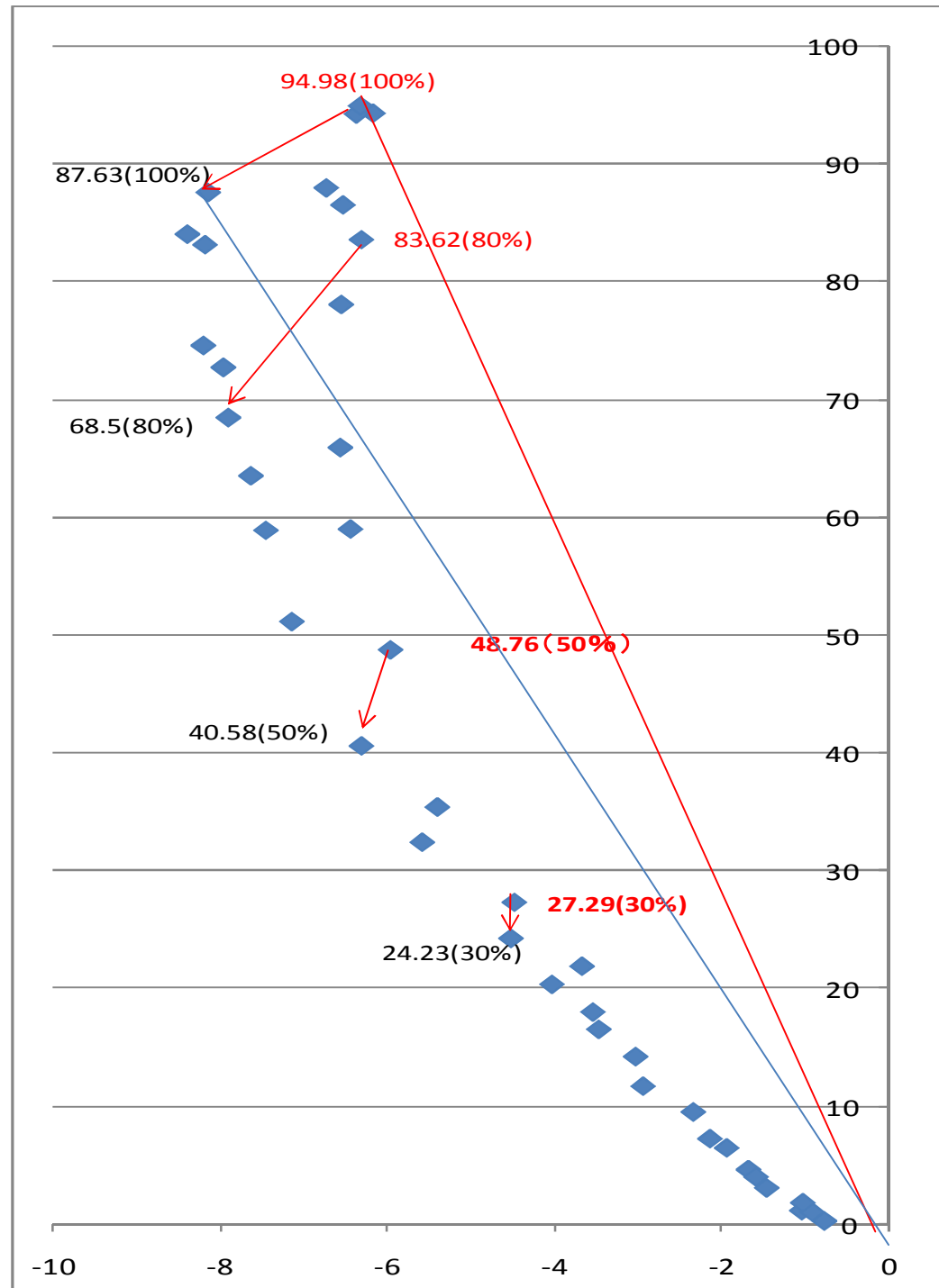
Graph for ΔE & (S-W)c* in Dot %(5~100%) of C & M



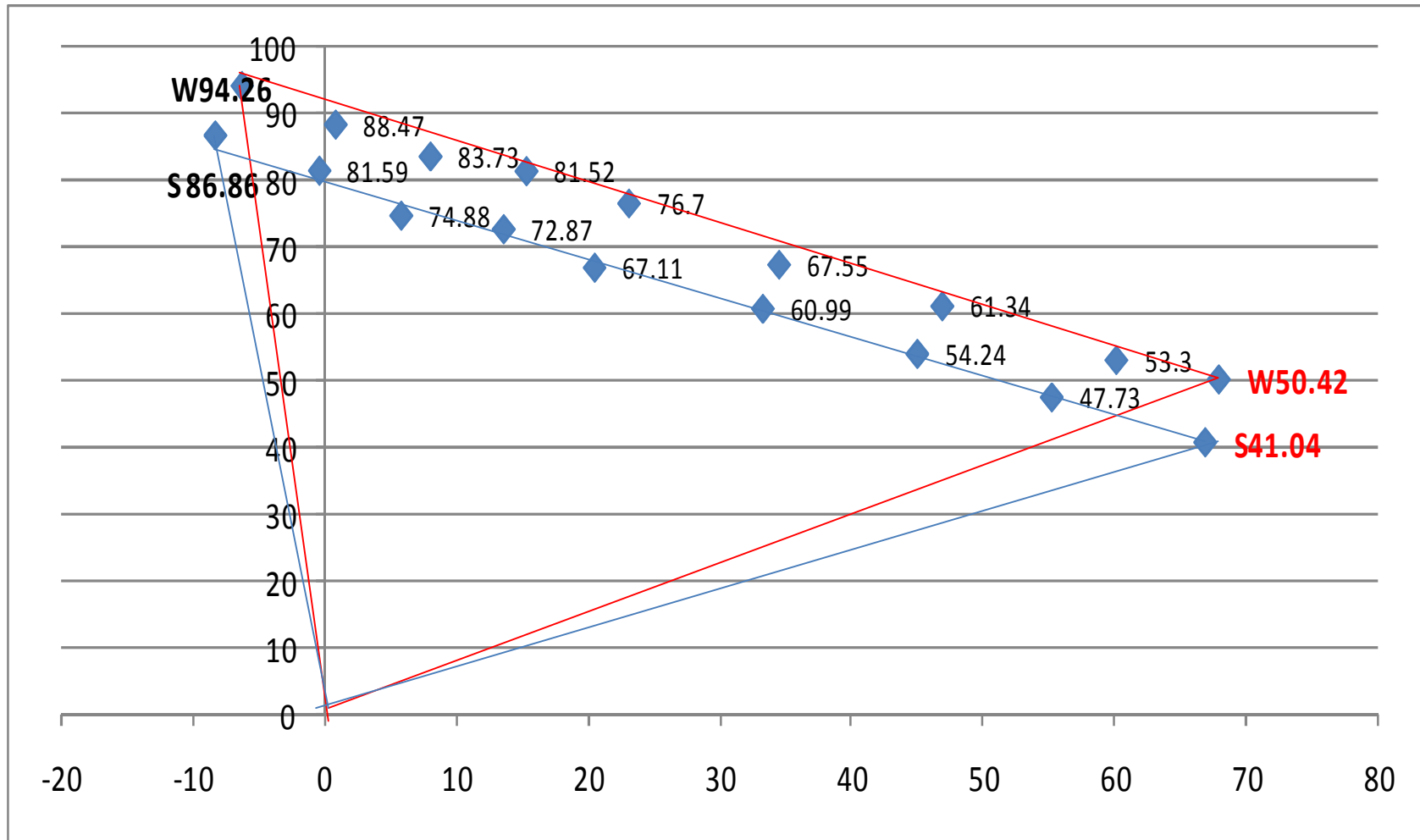
Y,M,C Chroma Curve (Sheet & Web)



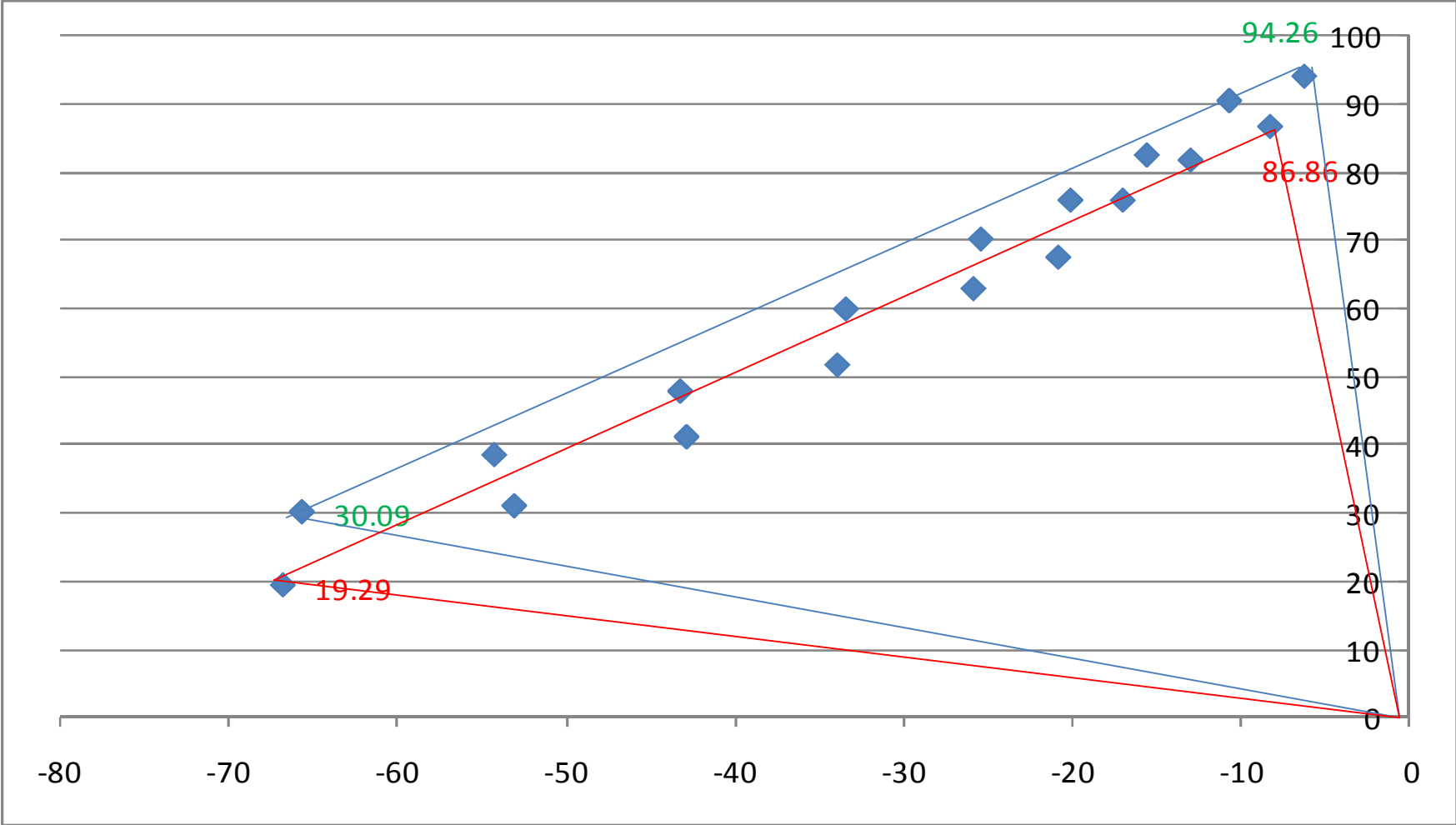
Y Gamut



Color Gamut of a*,b* (Sheet & Web) in Y—R Plane



Color Gamut of a*,b*(Sheet & Web) in Y—G Plane

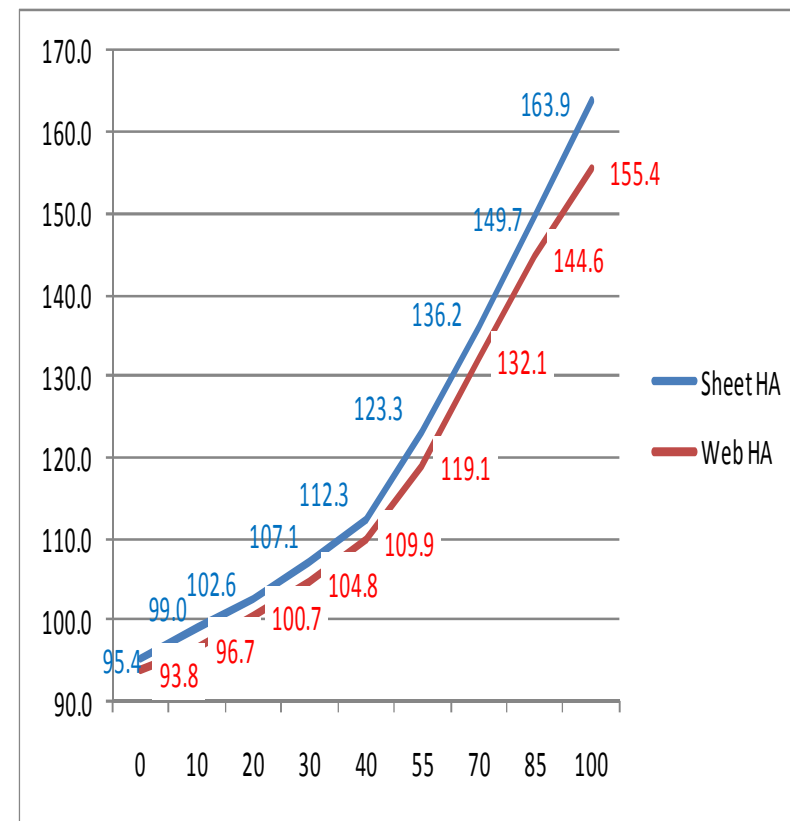


HA of (Sheet & Web) in Y100%—C(0~100%)

Table HA Y 100%- C 0~100%

Y100 C=	Sheet HA	Web HA
0	95.4	93.8
10	99.0	96.7
20	102.6	100.7
30	107.1	104.8
40	112.3	109.9
55	123.3	119.1
70	136.2	132.1
85	149.7	144.6
100	163.9	155.4

Fig Cyan (0,10,20,30,....100%)

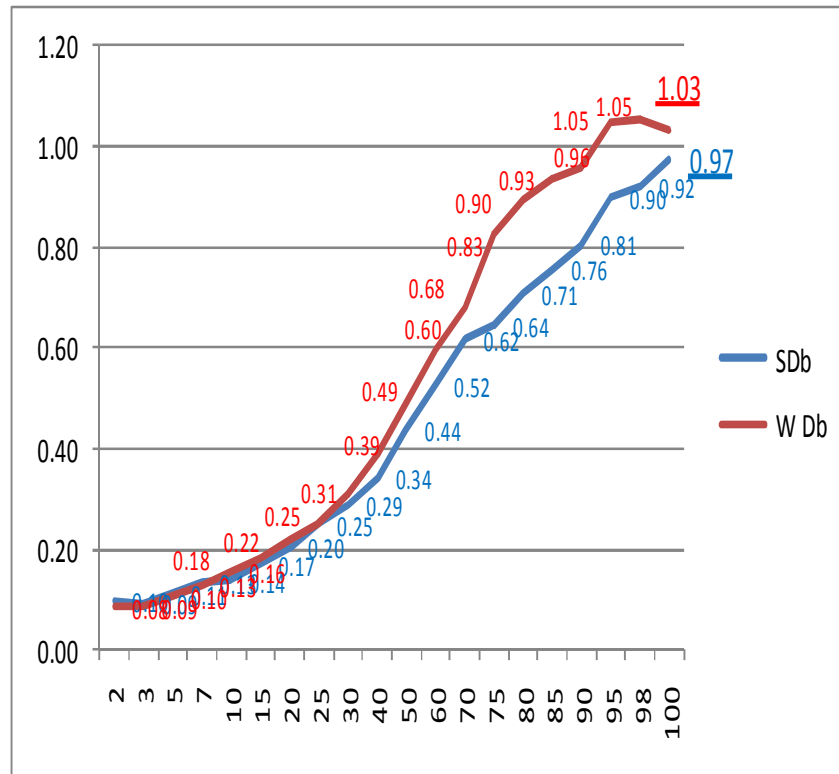


c* & D of Sheet & Web in Yellow

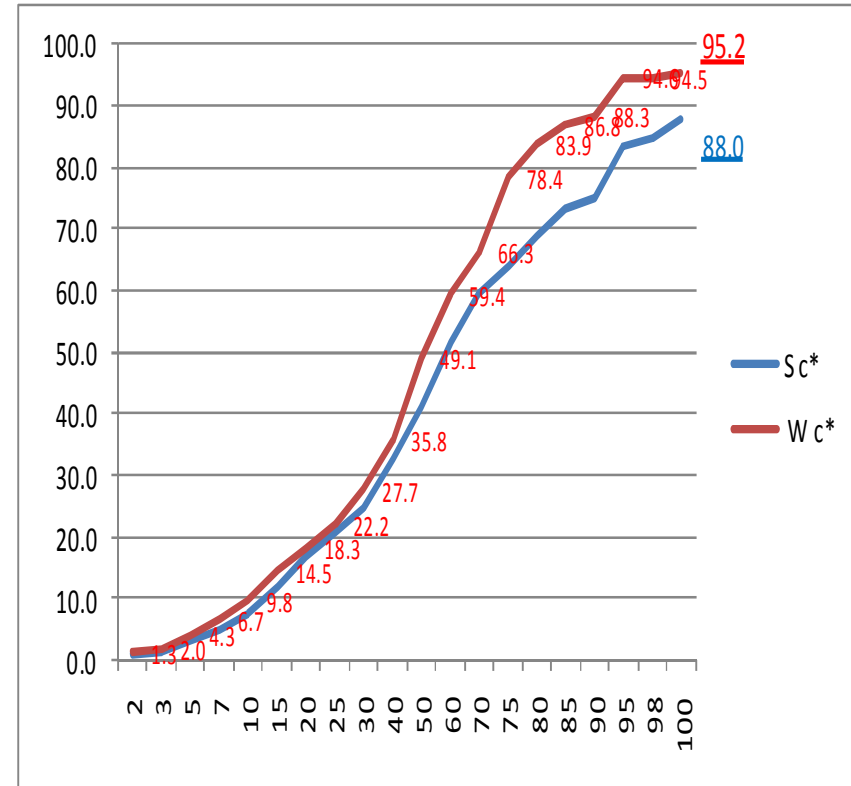
Y	S c*	SDb	W c*	W Db
2	0.8	0.10	1.3	0.08
3	1.5	0.09	2.0	0.09
5	3.4	0.11	4.3	0.10
7	4.9	0.13	6.7	0.13
10	7.5	0.14	9.8	0.16
15	12.0	0.17	14.5	0.18
20	16.9	0.20	18.3	0.22
25	20.7	0.25	22.2	0.25
30	24.6	0.29	27.7	0.31
40	32.9	0.34	35.8	0.39
50	41.1	0.44	49.1	0.49
60	51.6	0.52	59.4	0.60
70	59.4	0.62	66.3	0.68
75	64.0	0.64	78.4	0.83
80	69.0	0.71	83.9	0.90
85	73.2	0.76	86.8	0.93
90	75.1	0.81	88.3	0.96
95	83.6	0.90	94.6	1.05
98	84.5	0.92	94.5	1.05
100	88.0	0.97	95.2	1.03

Density & Chroma of Yellow Print

Density of Sheet & Web



Chroma of Sheet & Web



Density ,c* & E of (Sheet-Web) in Yellow

Y	Db(S-W)	c*(S-W)	ΔE
2	0.014	-0.54	1.73
3	0.009	-0.52	1.22
5	0.007	-0.90	1.40
7	0.008	-1.85	2.49
10	-0.019	-2.24	2.30
15	-0.012	-2.48	2.56
20	-0.013	-1.45	1.49
25	0.001	-1.45	1.79
30	-0.020	-3.01	3.07
40	-0.044	-2.92	3.31
50	-0.052	-8.06	8.28
60	-0.073	-7.72	7.90
70	-0.064	-6.90	7.10
75	-0.182	-14.38	14.65
80	-0.190	-14.90	15.23
85	-0.178	-13.62	13.91
90	-0.154	-13.21	13.48
95	-0.149	-10.98	11.36
98	-0.133	-10.02	10.42
100	-0.060	-7.18	7.73

Density Difference (S-W) & ΔE in C,M,Y

Dot%	Db(S-W)	Y ΔE	Dg(S-W)	M ΔE	Dr(S-W)	C ΔE
2	0.014	1.73	-0.008	0.73	0.019	1.67
3	0.009	1.22	0.024	2.19	0.019	1.62
5	0.007	1.40	0.021	1.89	0.021	1.77
7	0.008	2.49	0.003	0.69	0.009	0.73
10	-0.019	2.30	0.014	1.33	0.014	1.13
15	-0.012	2.56	0.018	1.71	0.023	1.68
20	-0.013	1.49	0.019	1.63	0.013	0.99
25	0.001	1.79	0.017	1.97	0.011	0.81
30	-0.020	3.07	0.003	0.75	0.000	0.34
40	-0.044	3.31	0.015	1.63	-0.007	1.27
50	-0.052	8.28	-0.004	1.45	-0.005	1.21
60	-0.073	7.90	0.013	1.64	-0.020	1.53
70	-0.064	7.10	0.018	2.12	-0.012	1.06
75	-0.182	14.65	-0.017	2.43	-0.010	0.77
80	-0.190	15.23	-0.066	4.27	-0.009	0.72
85	-0.178	13.91	-0.097	5.03	-0.008	1.78
90	-0.154	13.48	-0.020	1.82	-0.021	1.03
95	-0.149	11.36	0.035	1.55	0.023	0.80
98	-0.133	10.42	0.050	1.29	0.150	2.86
100	-0.060	7.73	0.060	1.39	0.221	3.93
Ave	-0.065	6.572	0.005	1.875	0.022	1.385
γ	-0.978	-	-0.755	-	0.866	-

Comparison on Color Difference & absolute value (c^* , L^* , HA) of **Web Offset** & **Japan Color Web 2003**, Sheet Fed Standard

Web Offset(D)-JCP2003(J)

Color	ΔE	D-J c^*	D-J L^*	HA D-J	Ab. Value
C	3.87	-1.49	3.09	1.72	6.30
M	1.40	-1.36	-0.25	-0.13	1.74
Y	5.62	5.53	0.88	0.33	6.74
R	4.82	1.71	-0.60	3.06	5.37
G	6.78	-0.19	2.39	-5.03	7.61
B	3.77	-0.09	1.67	3.75	5.51
	$\gamma = 0.4955$			$\gamma = 0.9222$	

Web Offset (D)-Sheet Fed (DS)

Color	ΔE	c^* DW-S	L^* DW-S	HA DW-S	Ab. Value
C	3.51	-2.56	2.4	-0.14	5.1
M	1.31	-0.41	1.14	-0.39	1.94
Y	7.68	7.21	0.43	-1.65	9.29
R	9.52	6.12	1.24	5.06	12.42
G	10.94	2.71	1.32	-8.52	12.55
B	4.01	0.96	0.99	4.23	6.18
	$\gamma = 0.7144$			$\gamma = 0.9892$	

Absolute value % (c*,L*,HA)of **Web Offset** & **Japan Color Web 2003**, Sheet Fed Standard

Web Offset(D)-JCP2003(J)

Color	ΔE	D-J c*	D-J L*	HA D-J	Ab. Value
C	3.87	24%	49%	27%	6.30
M	1.40	78%	14%	7%	1.74
Y	5.62	82%	13%	5%	6.74
R	4.82	32%	11%	57%	5.37
G	6.78	3%	31%	66%	7.61
B	3.77	2%	30%	68%	5.51

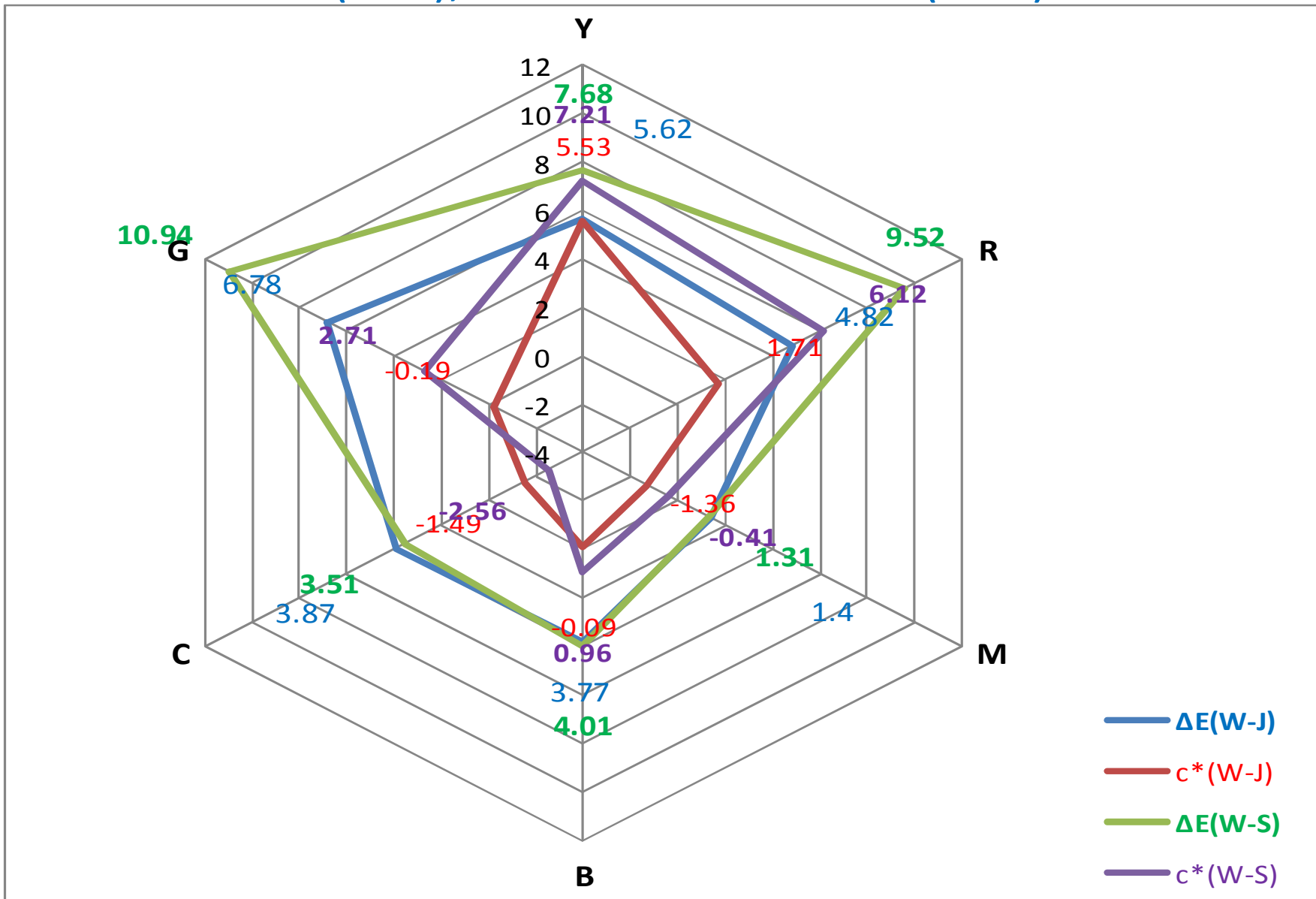
Web Offset (D)-Sheet Fed (DS)

Color	ΔE	c*DW-S	L*DW-S	HA DW-S	Ab. Value
C	3.51	50.2%	47.1%	2.7%	5.1
M	1.31	21.1%	58.8%	20.1%	1.94
Y	7.68	77.6%	4.6%	17.8%	9.29
R	9.52	49.3%	10.0%	40.7%	12.42
G	10.94	21.6%	10.5%	67.9%	12.55
B	4.01	15.5%	16.0%	68.4%	6.18

ΔE & c^* on Web Offset & Japan Color Web
2003(W-J), Sheet Fed Standard(W-S)

Color	$\Delta E(W-J)$	$c^*(W-J)$	$\Delta E(W-S)$	$c^*(W-S)$
C	3.87	-1.49	3.51	-2.56
M	1.4	-1.36	1.31	-0.41
Y	5.62	5.53	7.68	7.21
R	4.82	1.71	9.52	6.12
G	6.78	-0.19	10.94	2.71
B	3.77	-0.09	4.01	0.96

Graph of ΔE & c^* on Web Offset & Japan Color Web 2003(W-J), Sheet Fed Standard(W-S)



6、 Summary

- 1, Yellow in Web Offset Printing is better than Sheet Fed Printing.
- 2, Web Offset Printing in Density level is Lower than Sheet Fed Printing.
- 3, Secondary Colors(R,G,B) are larger than Primary Color (C,M,Y).
- 4, ΔE of Secondary Colors is dependent on Hue Angle (HA).
- 5, The chromatic value of Yellow in Web was larger corresponding Dot Area%.

7、Graphic Arts & Printing Education

Printing University in the World		
Country	Institute & University	Logo
USA	Rochester Insitute Technology	RIT
UK	The London College of Communication	LCC
Germany	TechnischeUniversitat Darmstadt	TUD
	Heidelberg Print Media Academy	HPMA
Russia	Moscow State Printing University	MGUP
China	Beijing Institute of Graphic Communication	BPU
ROC	Chinese Culture University	CCU
Korea	Pukyong National University	PKUN
	Dongguk University	DU
Japan	International Graphic Arts & Printing Uni.	IGU

RIT

College of Imaging Arts and Sciences

3D Digital Graphics BFA

Biomedical Photographic Communications BS Ceramics MFA

Ceramics and Ceramic Sculpture BFA

Computer Graphics Design MFA Digital Cinema BS Double Craft Major ** BFA

Film/Video/Animation BFA Fine Arts Studio BFA

Fine Arts Studio MST Fine Arts Studio MFA

Glass MFA Glass and Glass Sculpture BFA

Graphic Design BFA Graphic Design MFA Illustration BFA

Imaging and Photographic Technology BS

Imaging Arts/Computer Animation MFA Imaging Arts/Film MFA

Imaging Arts/Photography MFA

Industrial Design BFA Industrial Design MFA

Interior Design BFA Medical Illustration MFA

Medical Illustration BFA Metals MFA

Metals and Jewelry Design BFA

New Media - Design and Imaging BFA

New Media - Publishing BS Print Media MS

Professional Photographic Illustration BFA

Visual Art MST Visual Media BFA Wood MFA

Woodworking and Furniture Design BFA

Pukyong National University

- **Division of Image and Information Engineering**

Major of Graphic Arts Information Engineering

- Homepage(ko): <http://myweb.pknu.ac.kr/grap>

Major of Image System Science & Engineering

- Homepage(ko): <http://myweb.pknu.ac.kr/imagesys>

This division aims to cultivate qualified experts in this major field of study. For this purpose, we provide primary subjects specific to the development of images and information along with a practical application program correspondent to the needs of a knowledge based industry.

- **Major of Graphic Arts Information Engineering**

The aim of this major is to cultivate qualified experts that have the professional knowledge necessary in the art of printing and the practice of presswork in step with the introduction of modern electronic printing machines and the potential capacity to develop new technology for printing materials and to solve technical problems.

- **Major of Image System Science & Engineering**

This major aims to develop intensive studies of theoretical and practical knowledge about photographic science and adopt new technologies through technological advancements in mass media and display technology.

The various fields of a high tech industry relevant to information technology(in semiconductor production and telecommunication) are spotlighted.

Considering the future prospects for this branch of the high-tech industry, we are concentrating our efforts on the cultivation of experts.

London College of Communication

- [Showcase](#) [Video Showcase](#)
- **FdA Print Media Management at LCC**
- In response to a growing demand for management personnel who have appropriate technological knowledge and strategic management skills, supported by a postgraduate qualification at Masters level, the School has developed a new [MA in Print Media](#) in association with the [Heidelberg Print Media Academy](#), who host two one-week symposiums in Heidelberg.

The School of Printing and Publishing offers courses in subject areas including [Print Media and Production](#), [Publishing](#), [Book Arts](#), [Games Design](#), [Printmaking](#), [Surface Design](#), [Animation](#) and [Digital Media](#),

- The School of Printing and Publishing is one of four Schools in London College of Communication. The three other Schools are the [School of Graphic Design](#), the [School of Media](#) and the [School of Creative Enterprise](#).

Heidelberg Print Media Academy

- **Global Course Schedule**

At our 19 locations around the world, we convey sound knowledge about forward-looking printing technologies and successful management. All Print Media Academies are in constant touch to share information about the latest industry trends. This lets us develop our training programs in close consultation while taking regional needs into account.

Here you'll find the suitable course in your region:

A simple overview of our locations and addresses can be found [here](#).

Beijing Institute of Graphic Communication

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画像コミュニケーション学科: 画像評価論、ネットワーク論、画像情報論、デジタルフォト論、CTP論、高品位印刷画像論

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Among all paper ;

T.Sretentseva et al ,MGUP: Investigation of the influence of the Composition and rheological characteristics of photo-polymerized system

K.V. Faraenbrukh et al, MGUP: Research of interaction on the border polymer film-ink

The Standardization of Color Reproduction on Web Offset Printing & Graphic Arts Education

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for your attention.**

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