



Jetbest Corporation

Technical information on New ECO ink

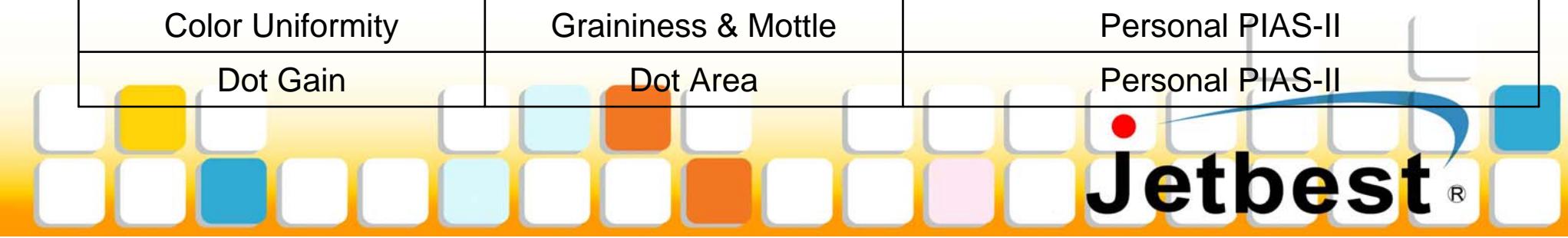
JETBEST SS21 Inks
vs.
MIMAKI SS21 Inks

Jetbest R & D Department



Benchmarking the Print Quality of Two Ink Types

Test Parameters	Mimaki	Jetbest
Printer	JV33	JV33
Material	3M Controltac	3M Controltac
Setting	High quality/1440 dpi	High quality/1440 dpi
Ink	Mimaki SS21 Ink	Jetbest SS21 Ink
Measurements		
Print Quality	Metrics	Instrument
Tone Reproduction	Density	GretagMacbeth® Eye-One
Color	L*a*b*	GretagMacbeth® Eye-One
Color Gamut	L*a*b*	GretagMacbeth® Eye-One
Sharpness & Details	Line Quality	Personal PIAS-II
Intercolor Bleed (ICB)	Line Width	Personal PIAS-II
Color Uniformity	Graininess & Mottle	Personal PIAS-II
Dot Gain	Dot Area	Personal PIAS-II



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Instruments



PIAS®-II
Personal Image Analysis System



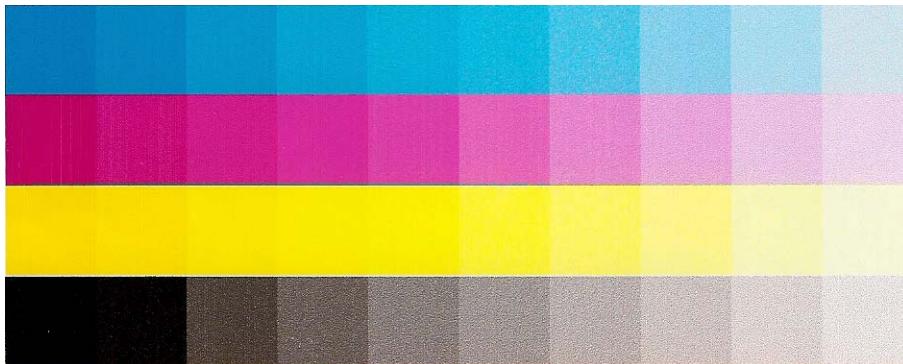
GretagMacbeth® Eye-One



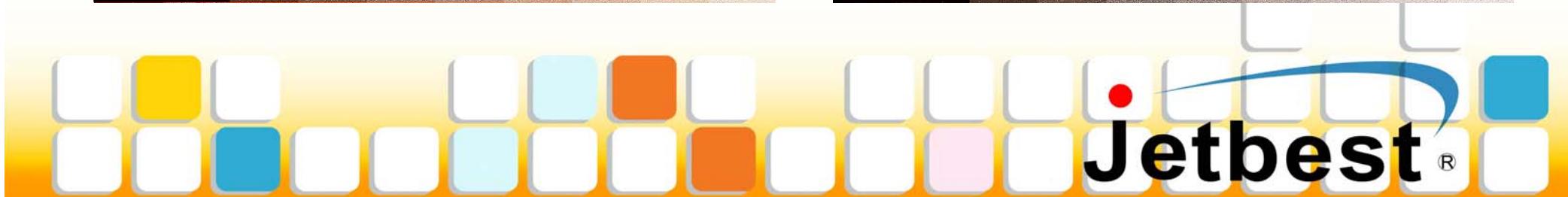
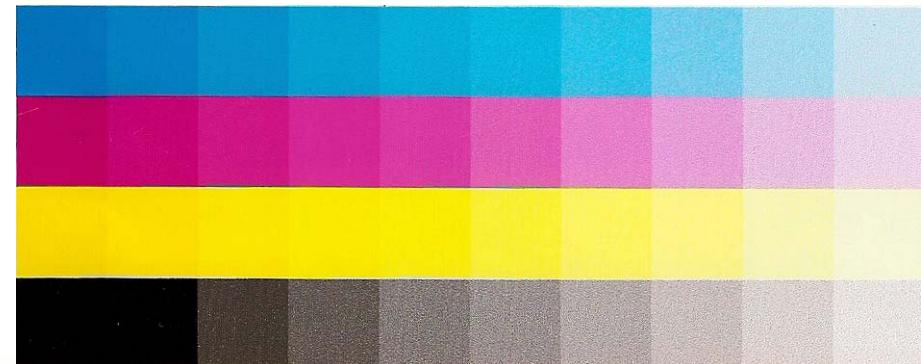
Tone Reproduction Curves (TRC)

- Tone reproduction curves show the relationship between optical density and tone%, or in other words, the input-output relationship in a printing system.
- Tone reproduction data can be obtained by means of either the Eye-One or the Personal PIAS-II.
- Measurement accuracy for density and color is usually higher for the Eye-One than the camera-based Personal PIAS-II.
- **The TRCs below show that the two ink types exhibit almost identical tone reproduction (or input-output) characteristics.**

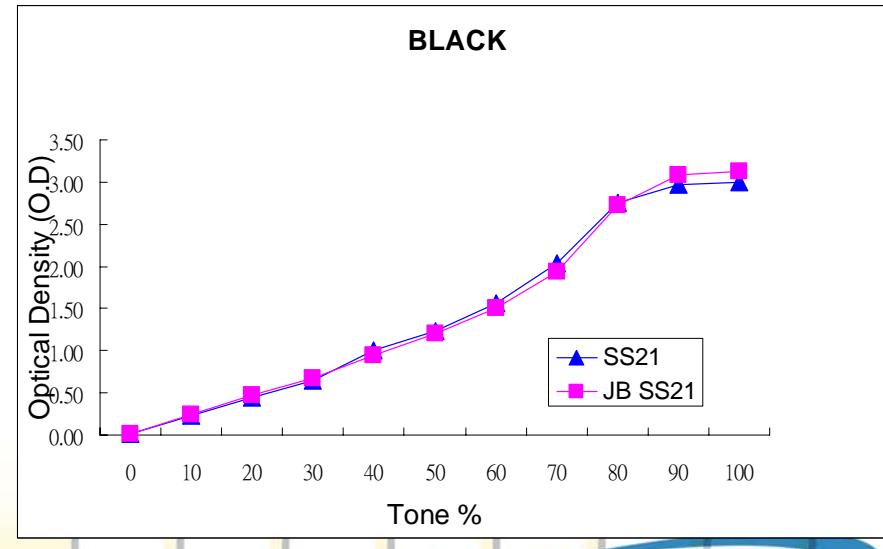
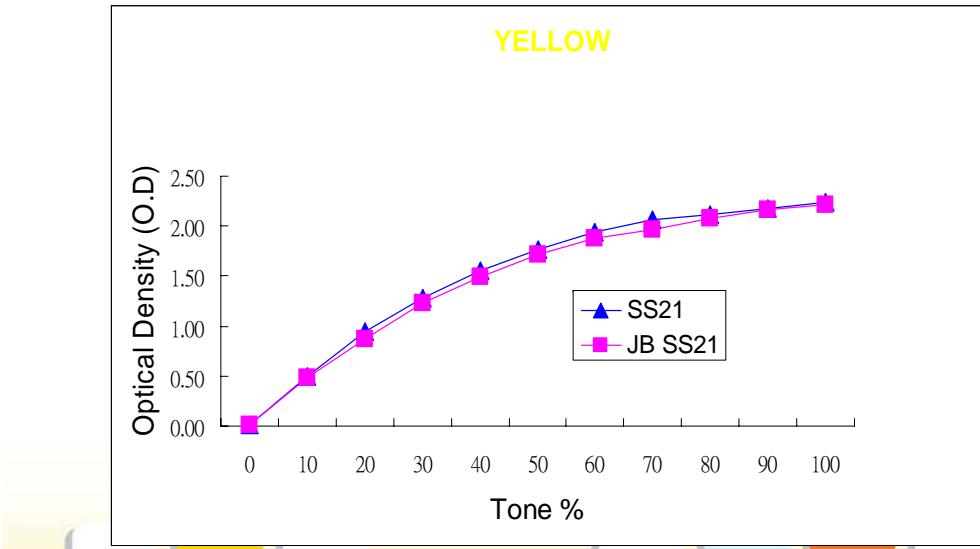
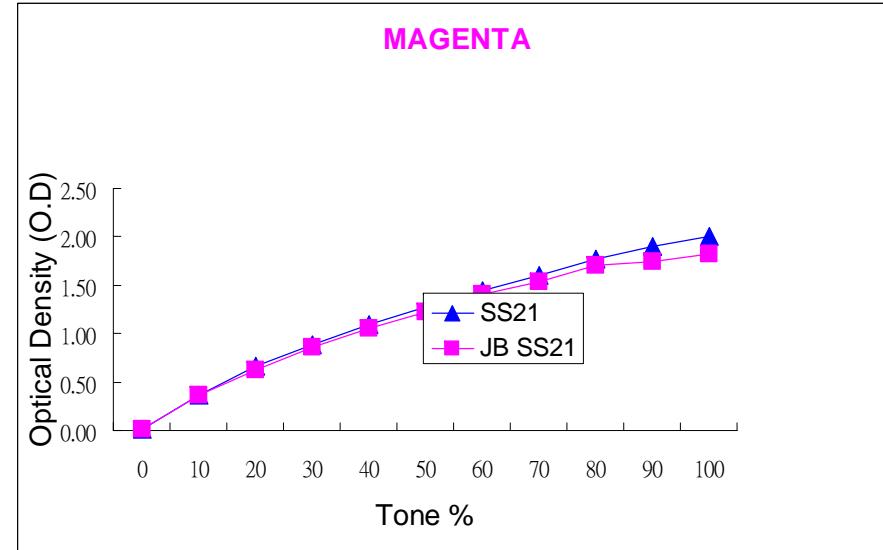
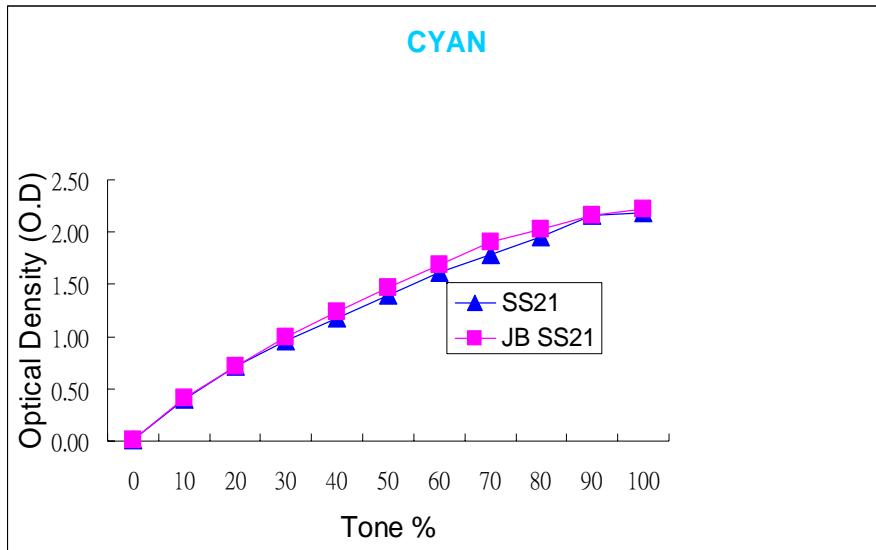
Mimaki SS21



Jetbest SS21



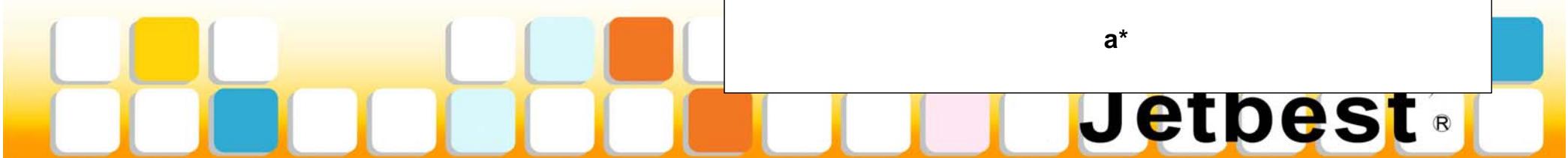
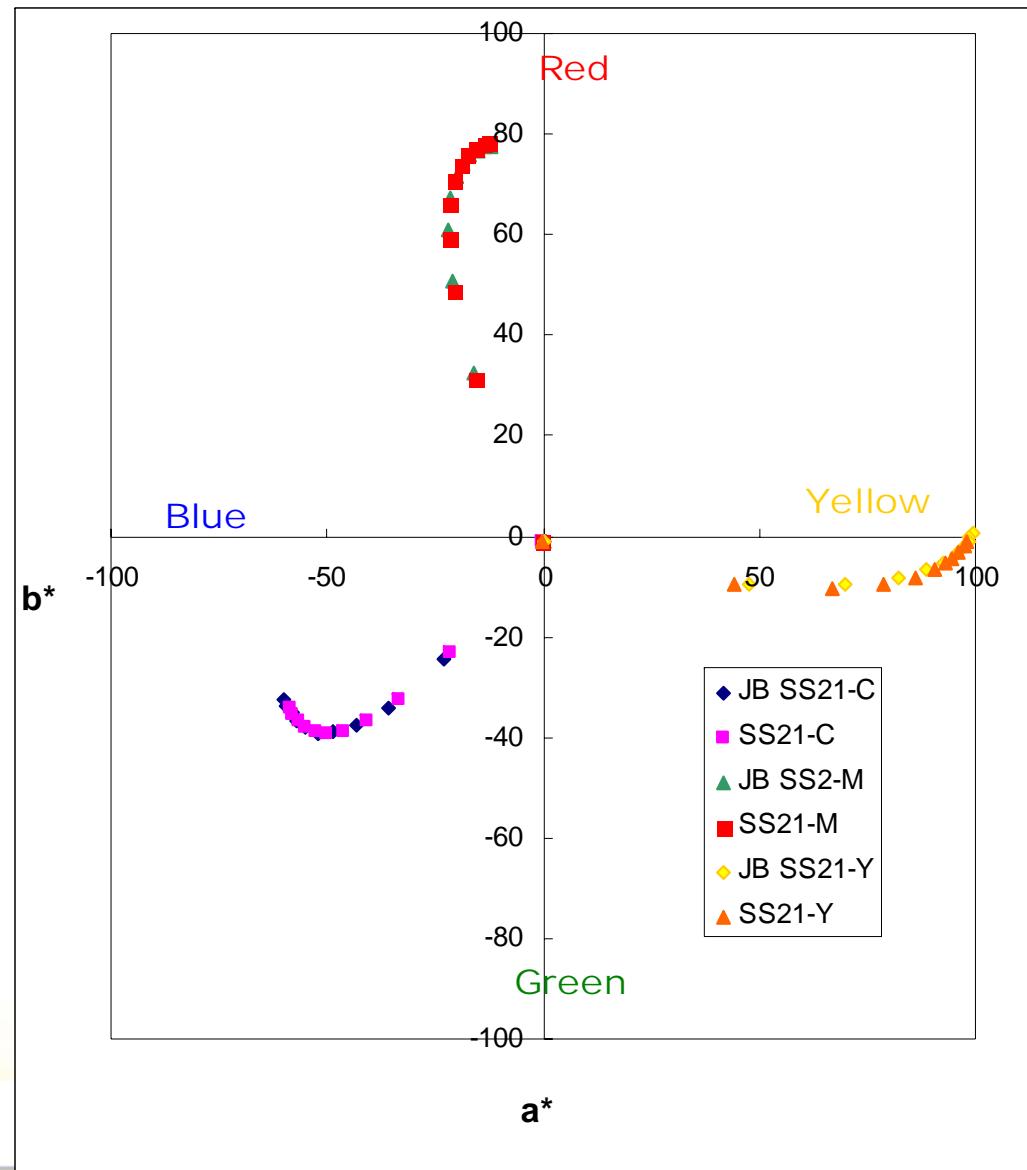
Tone Reproduction Curves (TRC)



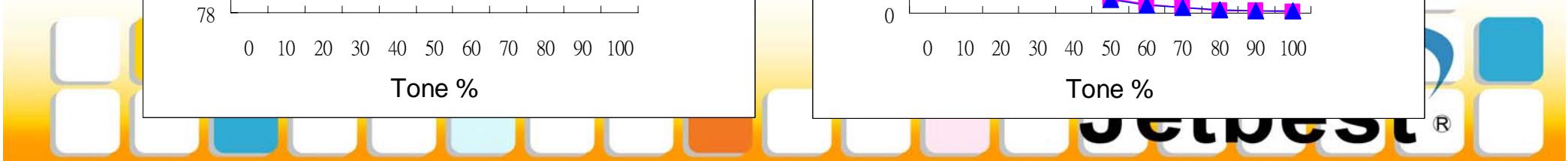
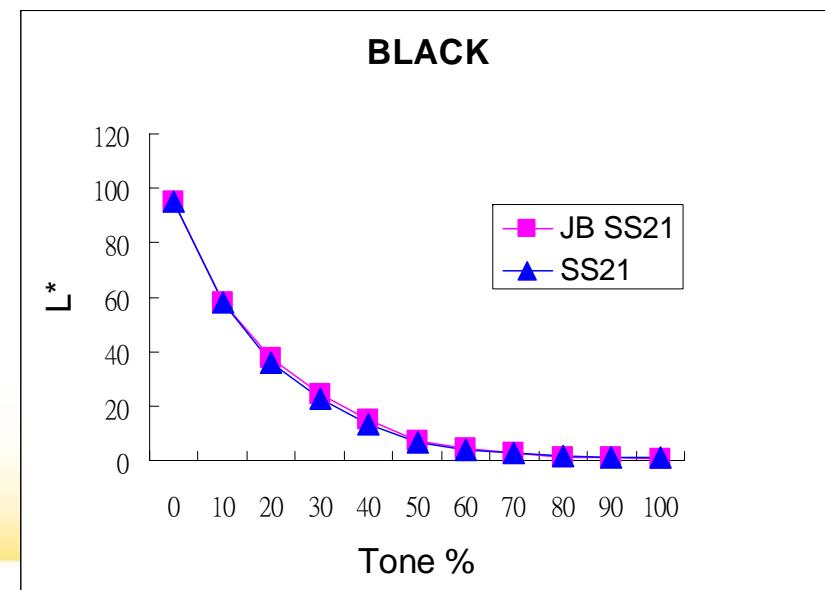
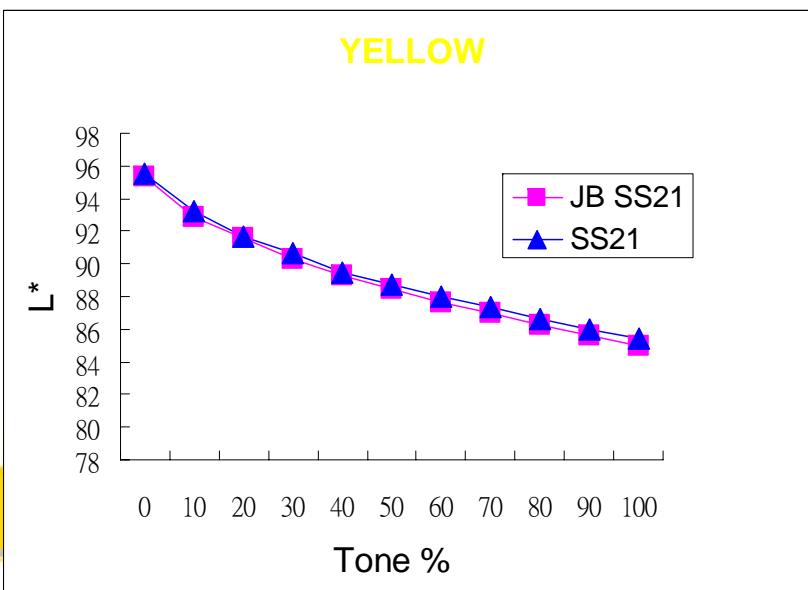
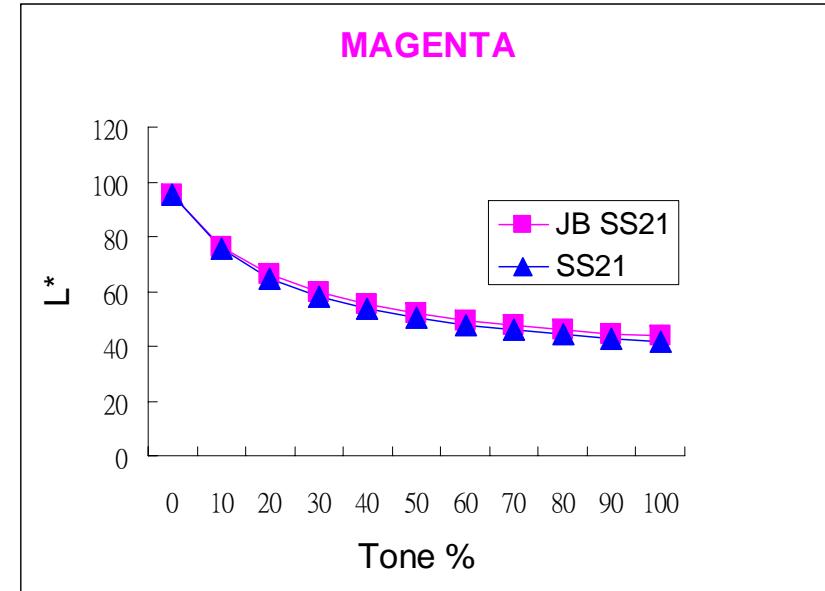
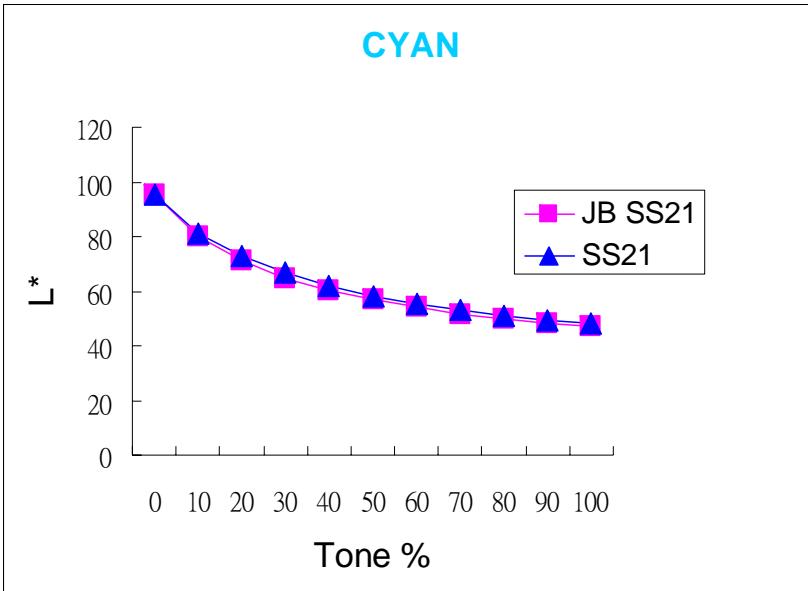
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CIELab Color

- CIELab or L*a*b* color data here are obtained using the GretagMacbeth® Eye-One.
- The results are plotted in (a) an a*-b* plot, and (b) Tone%-L* plots.
- **The results here show that the color characteristics for the two ink types are quite similar.**



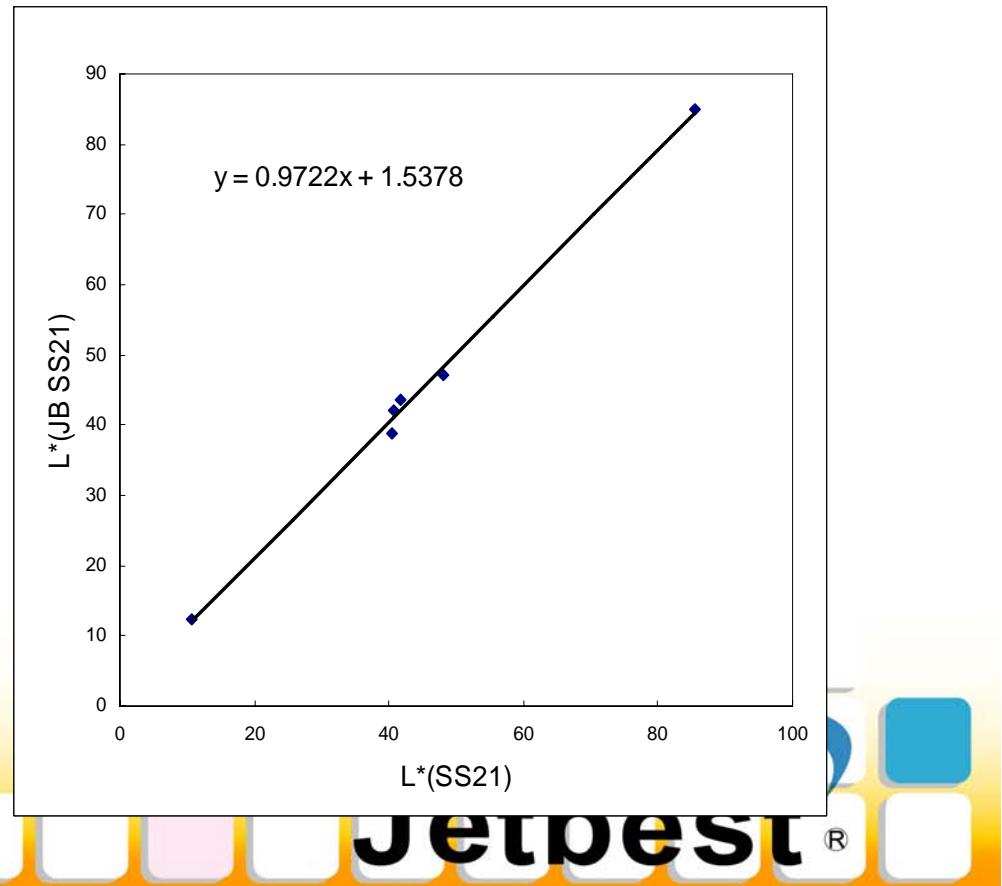
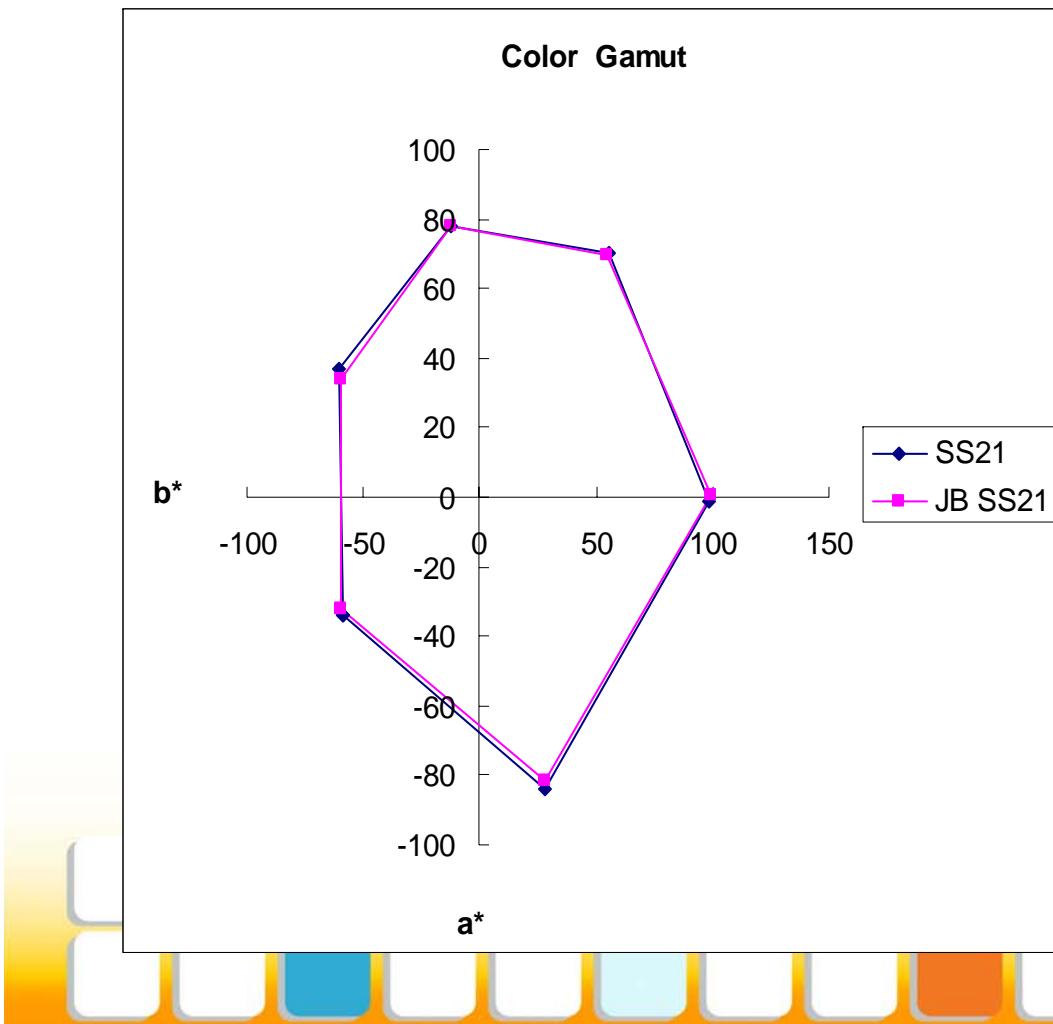
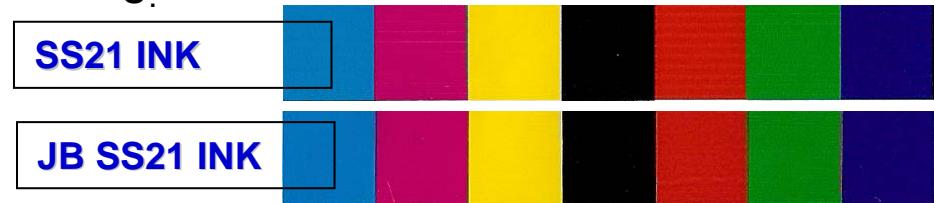
CIELab Color



Color Gamut*

Illuminant:	D50
Observer:	2 deg
Color Density Standard:	Status T

* Color gamut is the size of the color space within which a printing system is capable of reaching.

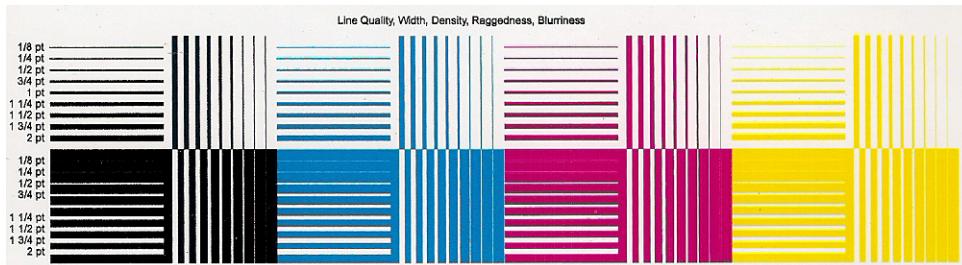


Line Quality Analysis

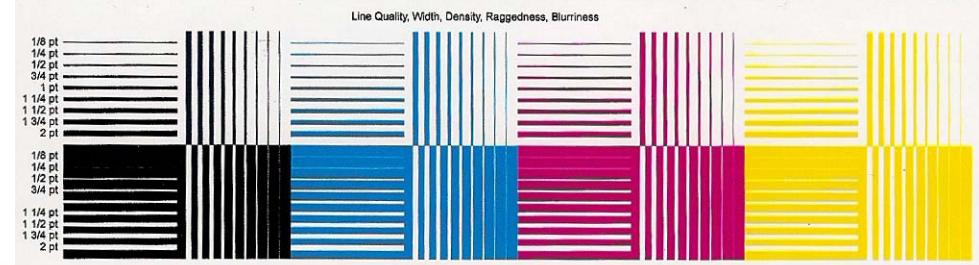
Measurements:	Line Quality*
Instrument:	QEA Personal PIAS-II

- Line Quality Metrics include: width, blurriness, raggedness, line density, contrast and fill.
- The above metrics are computed based on the ISO-13660 international print quality standard.
- Line quality is fundamental to the reproduction of fine lines, details and resolution in a printing system.

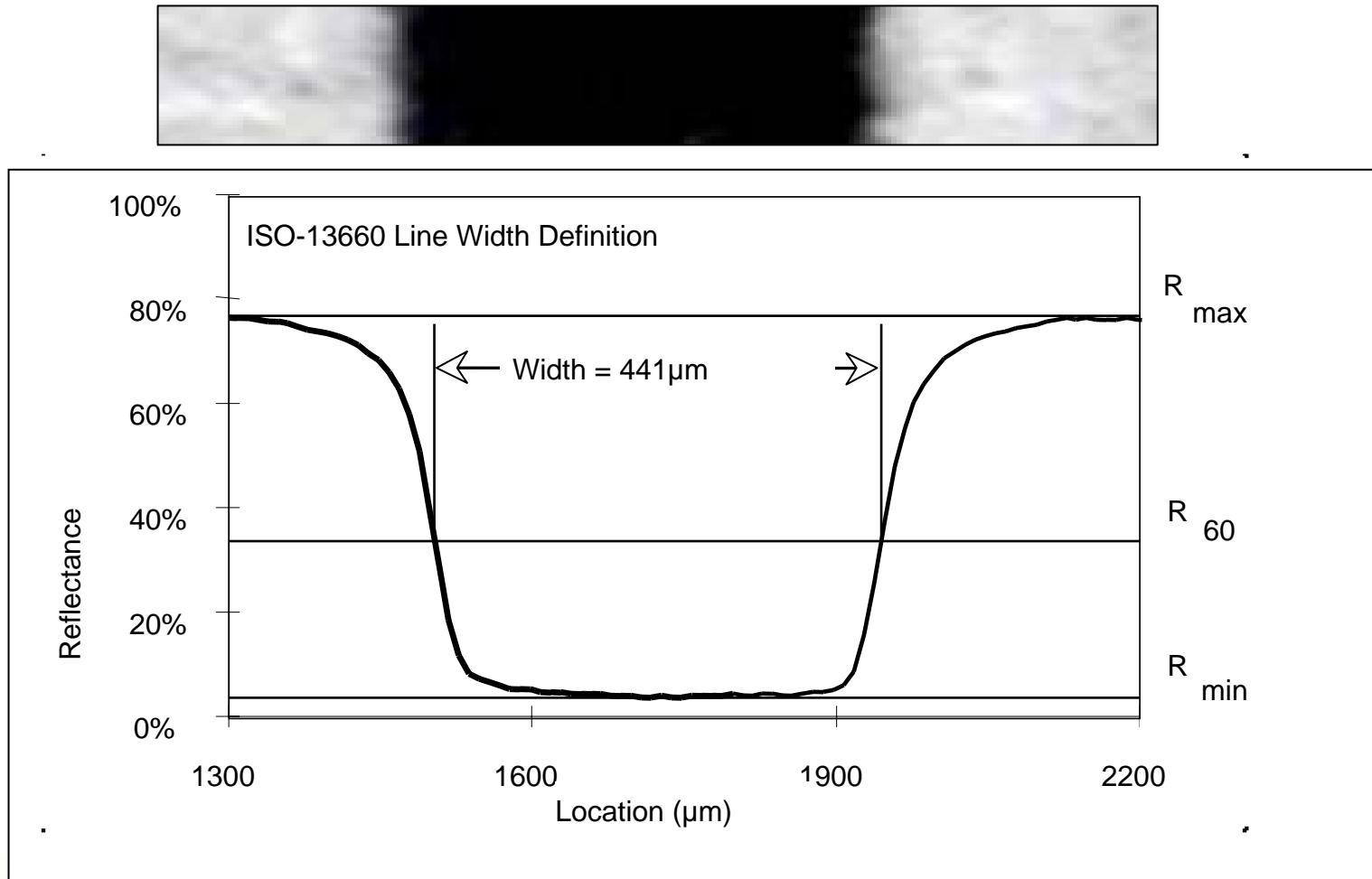
SS21 INK



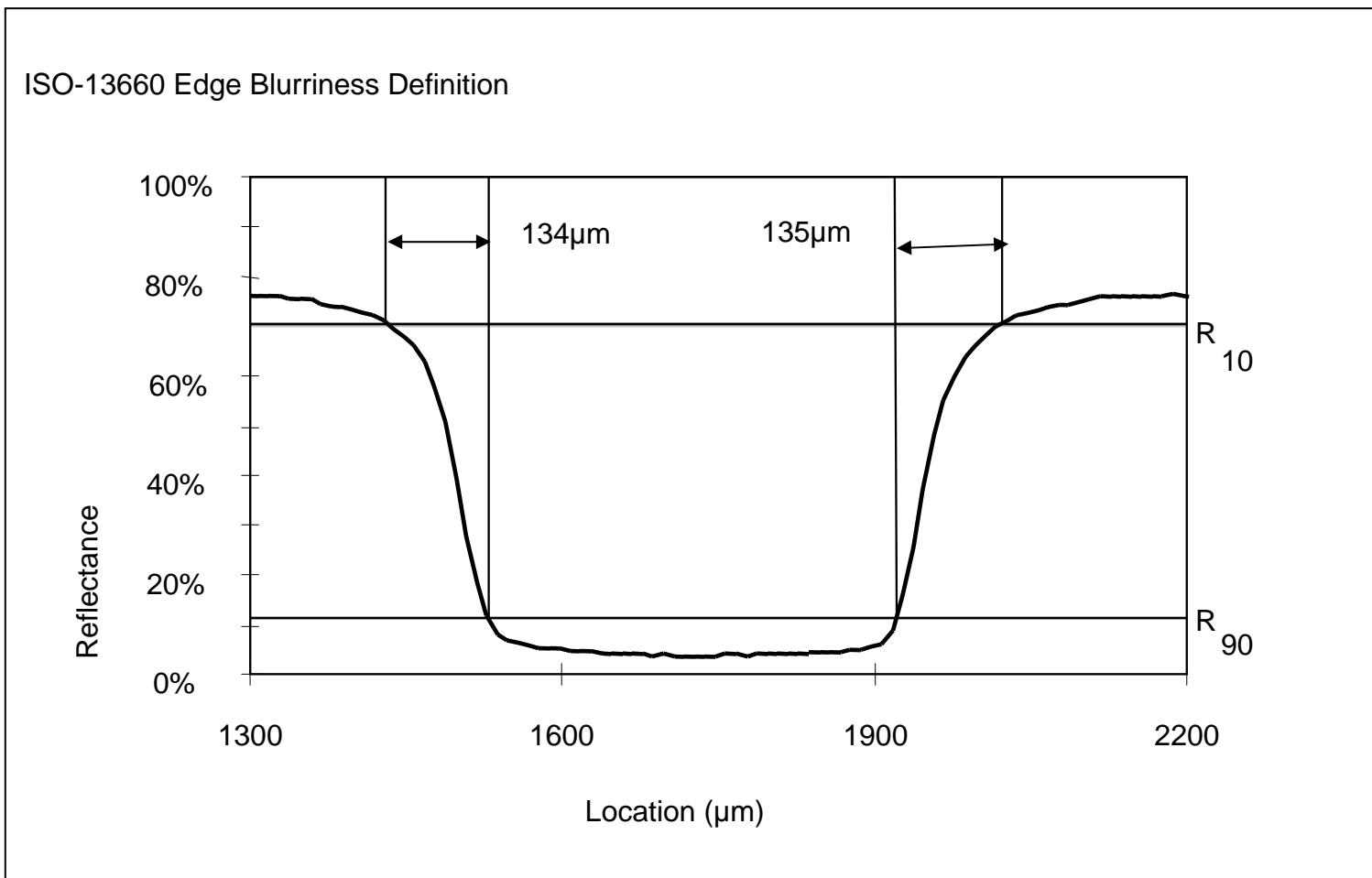
JB SS21 INK



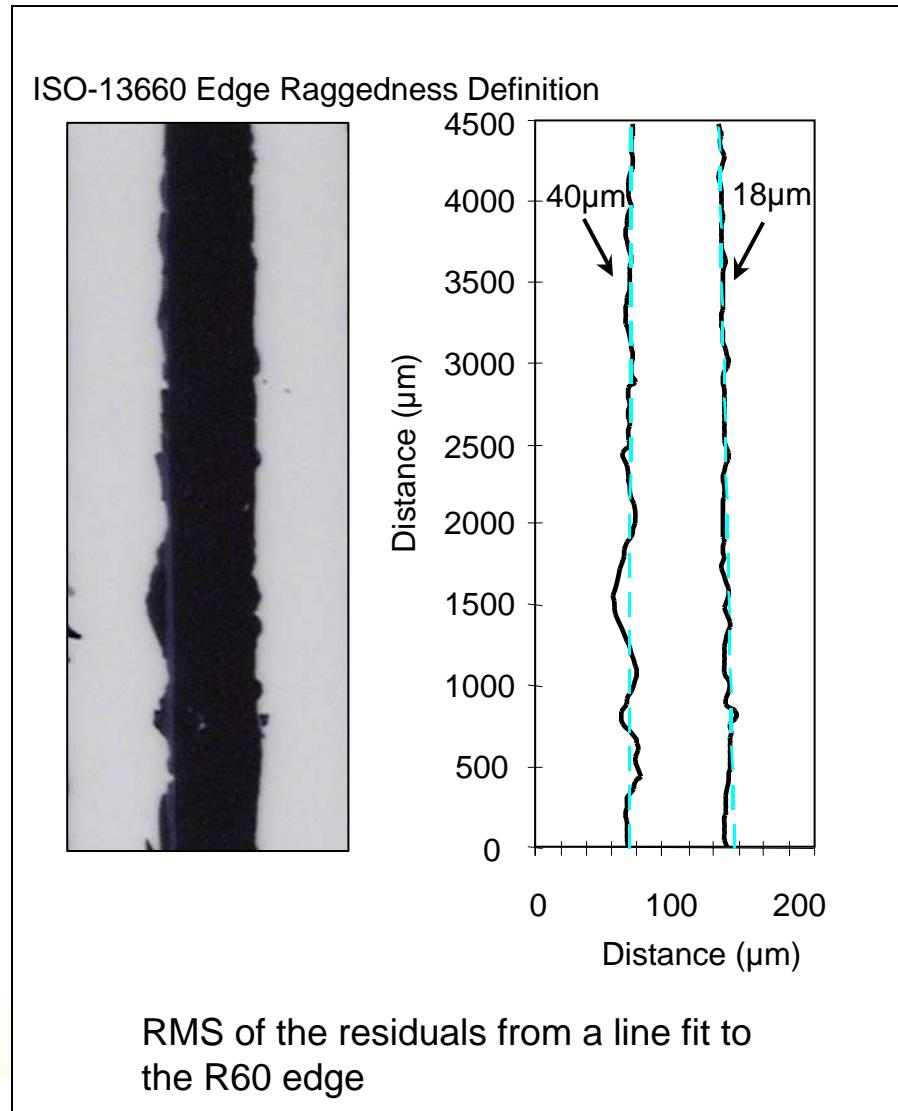
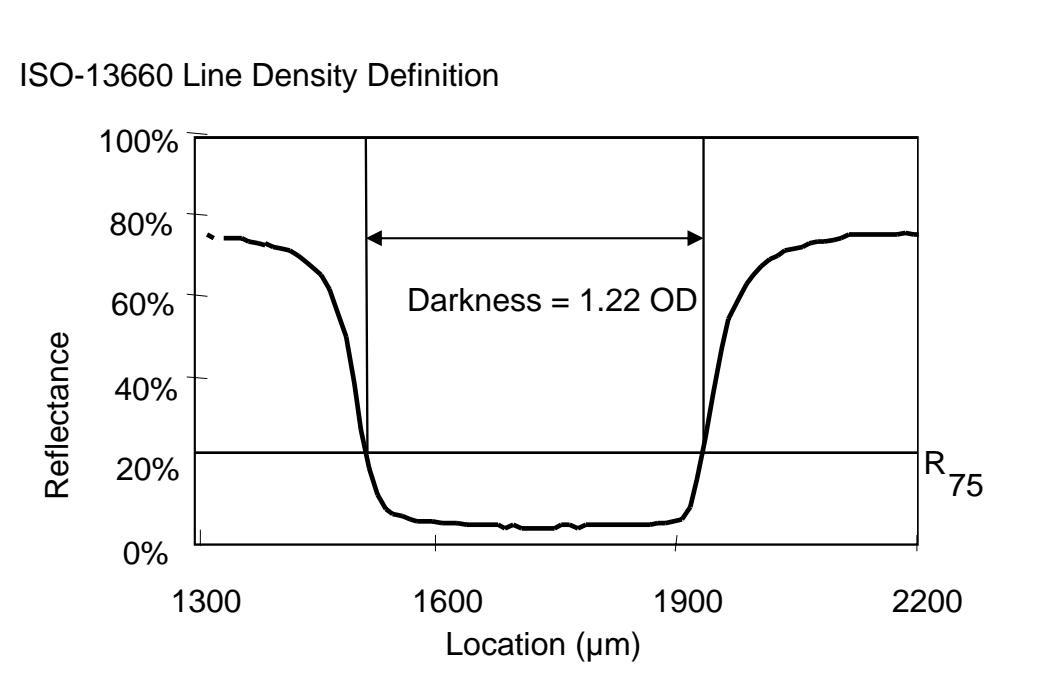
Line Quality Analysis



Line Quality Analysis



Line Quality Analysis



RMS of the residuals from a line fit to
the R60 edge



Line Quality Analysis Summary

Vertical	Target		Measured Line Width (μm)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	441.6	417.3	280.6	310.4
C Average	1.014	357.7	379.6	391.3	309.1	315.7
M Average	1.014	357.7	383.5	385.3	307.4	315.2
Y Average	1.014	357.7	415.5	399.3	291.3	293.2
All Color Avg.	1.014	357.7	405.1	398.3	297.1	308.6



Line Quality Analysis Summary

Vertical	Target		Blurriness (µm)			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	94.5	91.7	93.2	88.1
C Average	1.014	357.7	91.6	101.2	94.1	90.8
M Average	1.014	357.7	102.7	97.5	103.4	99.0
Y Average	1.014	357.7	123.6	111.9	112.9	112.8
All Color Avg.	1.014	357.7	103.1	100.6	100.9	97.7



Line Quality Analysis Summary

Vertical	Target		Raggedness (μm)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	4.0	3.8	3.6	3.8
C Average	1.014	357.7	2.6	4.0	3.2	2.7
M Average	1.014	357.7	4.5	4.2	2.5	3.2
Y Average	1.014	357.7	2.5	3.9	3.2	5.0
<i>All Color Avg.</i>	<i>1.014</i>	<i>357.7</i>	<i>3.4</i>	<i>4.0</i>	<i>3.1</i>	<i>3.7</i>



Line Quality Analysis Summary

Vertical	Target		Density (OD)			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	0.91	0.90	0.19	0.19
C Average	1.014	357.7	0.82	0.82	0.19	0.19
M Average	1.014	357.7	0.66	0.65	0.18	0.17
Y Average	1.014	357.7	0.60	0.61	0.18	0.18
<i>All Color Avg.</i>	<i>1.014</i>	<i>357.7</i>	<i>0.75</i>	<i>0.74</i>	<i>0.19</i>	<i>0.18</i>



Line Quality Analysis Summary

Vertical	Target		Contrast			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	0.84	0.84	0.91	0.90
C Average	1.014	357.7	0.80	0.80	0.87	0.88
M Average	1.014	357.7	0.72	0.71	0.79	0.78
Y Average	1.014	357.7	0.69	0.69	0.76	0.77
All Color Avg.	1.014	357.7	0.76	0.76	0.83	0.83

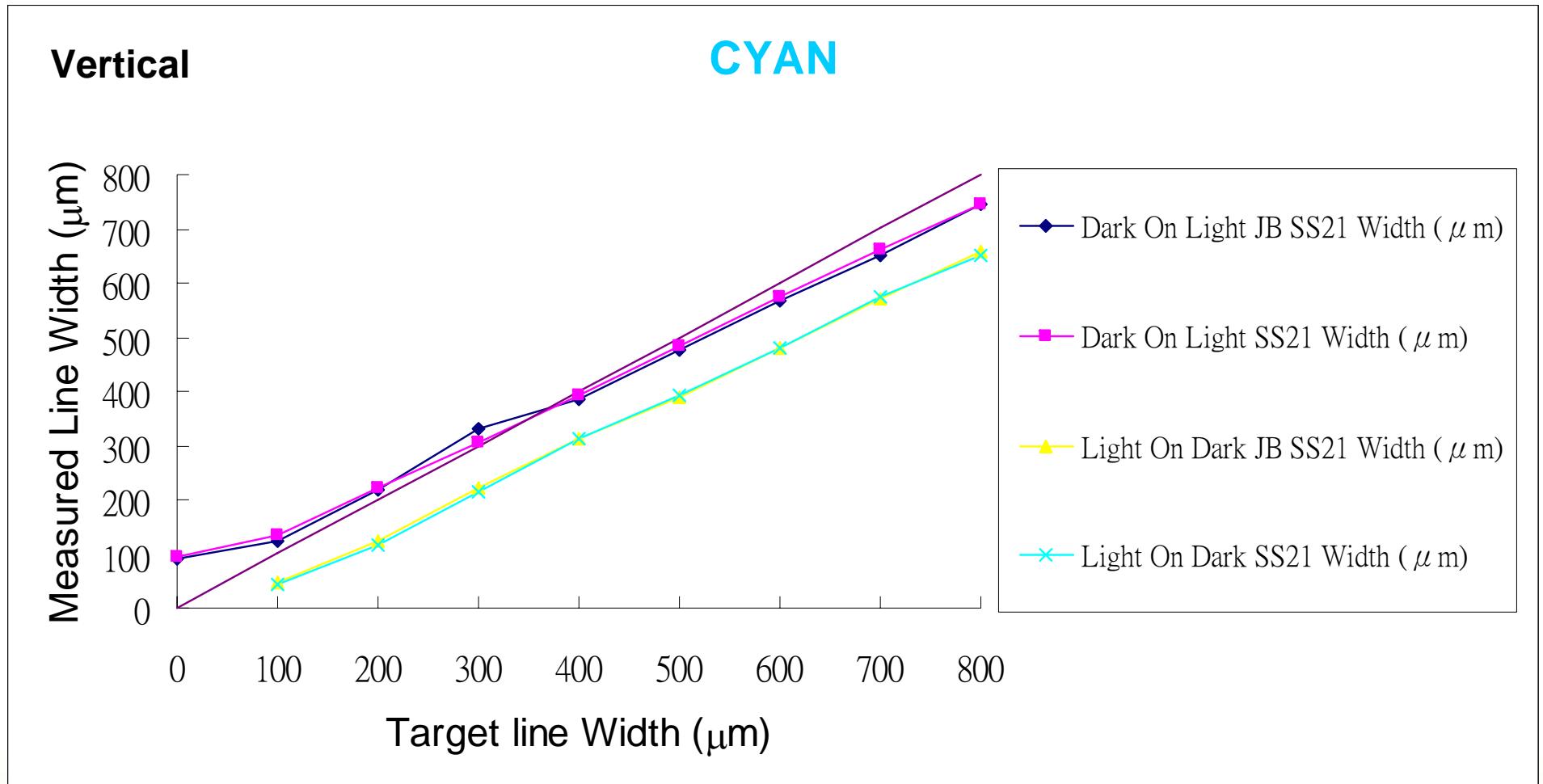


Line Quality Analysis Summary

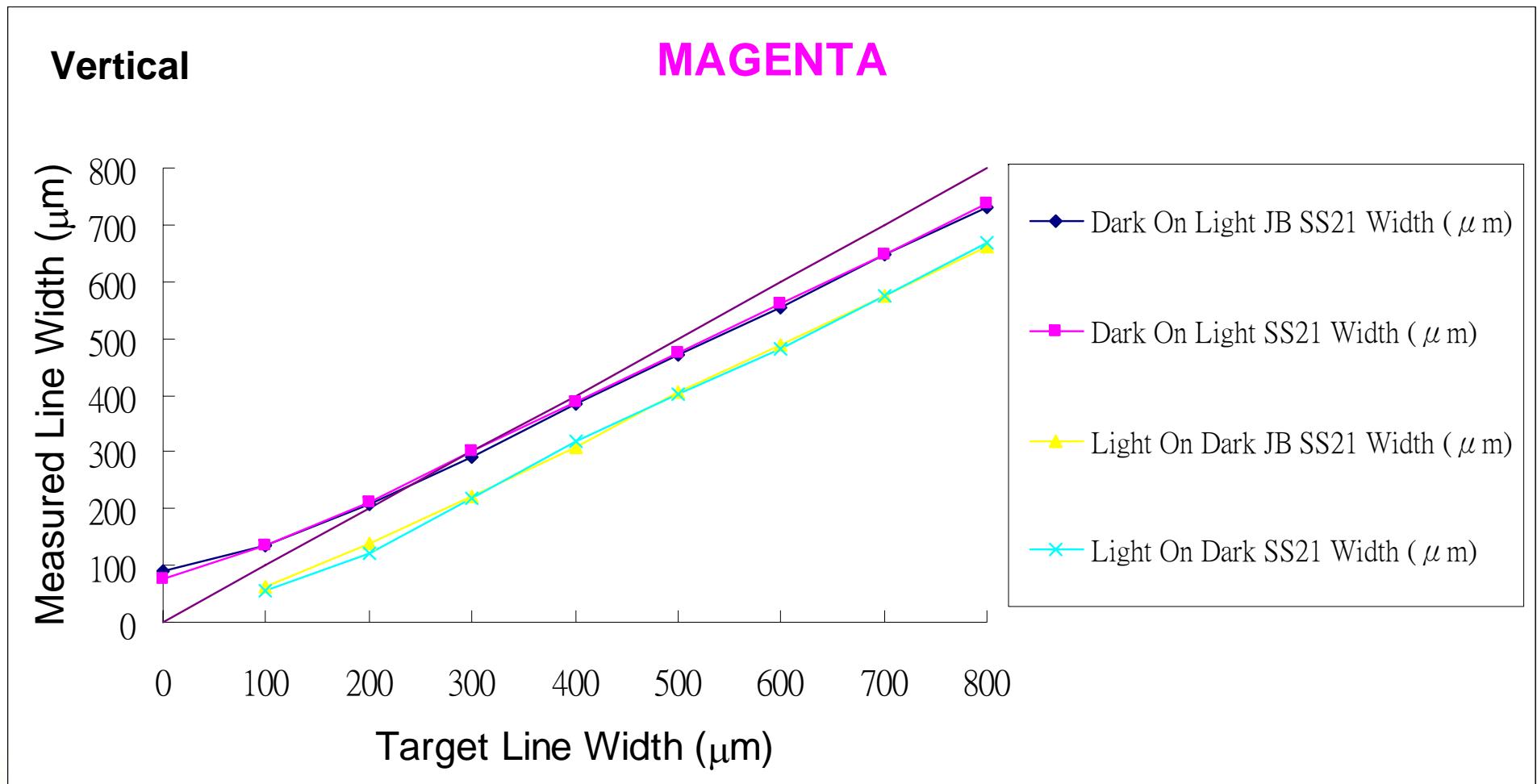
Vertical	Target		Fill			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	1.00	1.00	1.00	1.00
C Average	1.014	357.7	1.00	1.00	1.00	1.00
M Average	1.014	357.7	1.00	1.00	1.00	1.00
Y Average	1.014	357.7	1.00	1.00	1.00	1.00
<i>All Color Avg.</i>	<i>1.014</i>	<i>357.7</i>	<i>1.00</i>	<i>1.00</i>	<i>1.00</i>	<i>1.00</i>



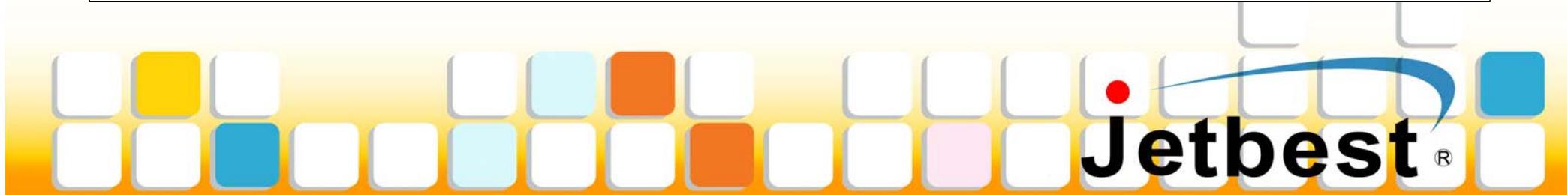
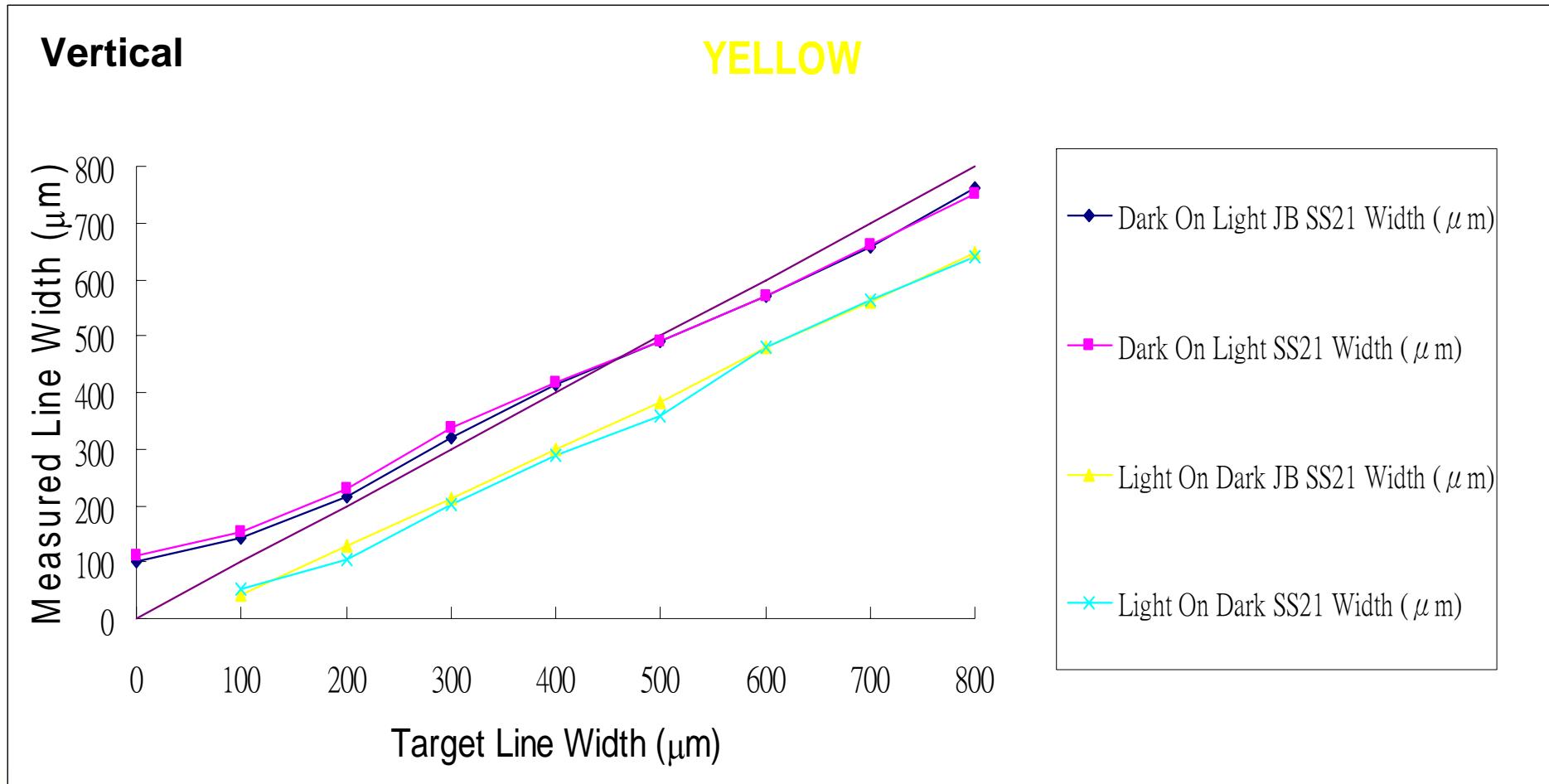
Line Quality Analysis Summary



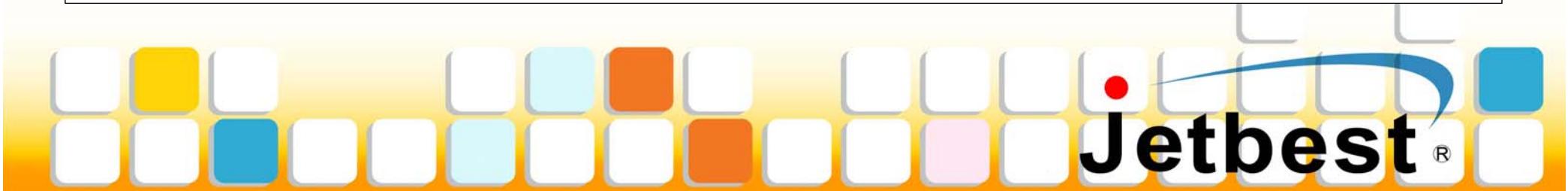
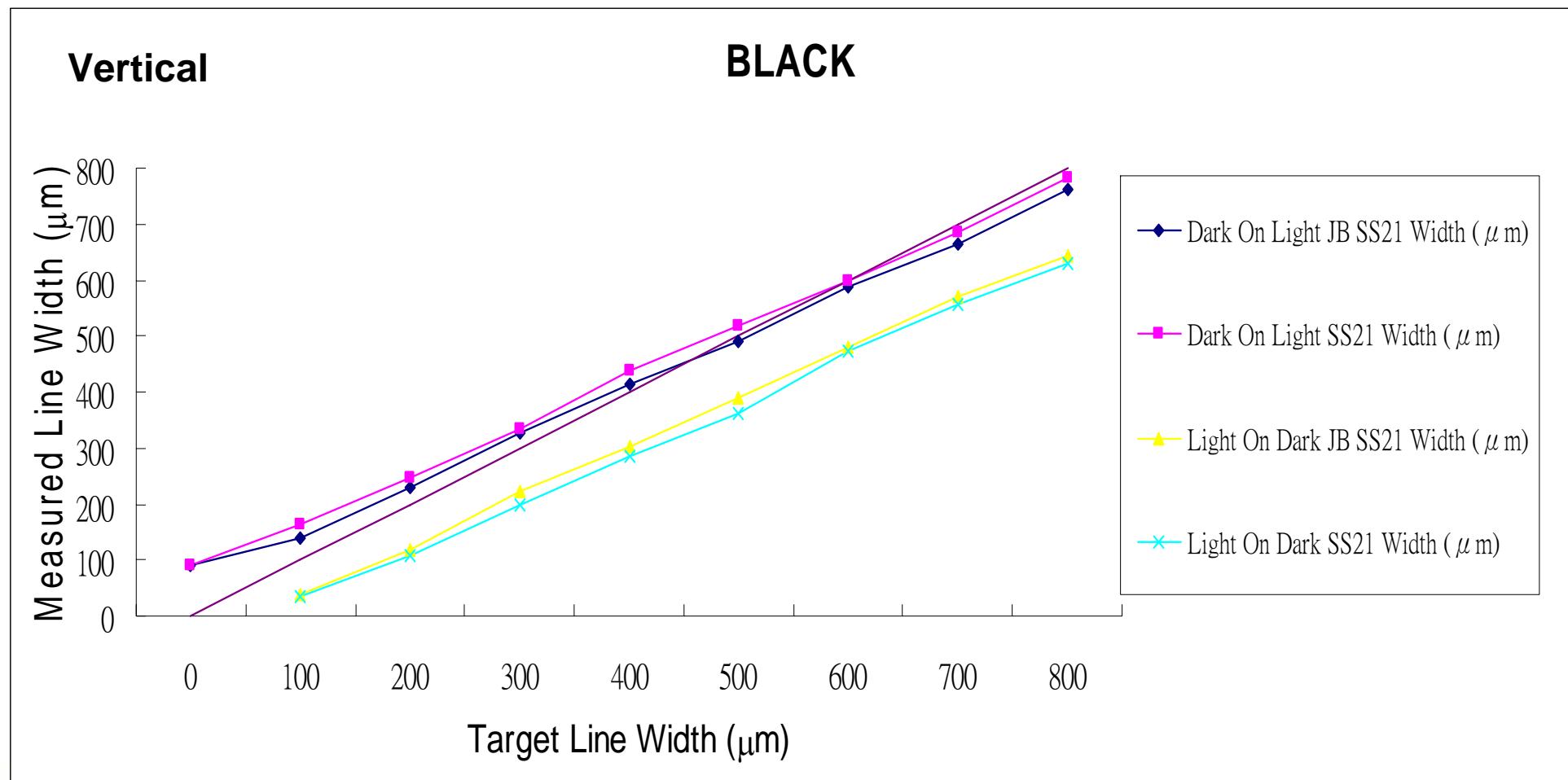
Line Quality Analysis Summary



Line Quality Analysis Summary



Line Quality Analysis Summary



Line Quality Analysis Summary

Horizontal	Target		Measured Line Width (μm)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	447.3	454.1	273.8	266.1
C Average	1.014	357.7	421.2	433.2	266.5	286.2
M Average	1.014	357.7	405.2	426.1	261.7	275.5
Y Average	1.014	357.7	433.4	406.9	262.6	370.1
All Color Avg.	1.014	357.7	426.8	430.1	266.2	299.5



Line Quality Analysis Summary

Horizontal	Target		Blurriness (μm)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	122.2	138.0	89.1	109.8
C Average	1.014	357.7	140.0	150.5	122.2	124.4
M Average	1.014	357.7	151.5	170.1	157.6	168.5
Y Average	1.014	357.7	165.3	136.7	143.6	137.4
All Color Avg.	1.014	357.7	144.8	148.8	128.1	135.0



Line Quality Analysis Summary

Horizontal	Target		Raggedness (μm)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	4.1	10.2	5.1	5.9
C Average	1.014	357.7	3.9	10.2	3.7	8.1
M Average	1.014	357.7	5.6	8.2	3.6	11.5
Y Average	1.014	357.7	4.2	4.9	7.8	6.6
<i>All Color Avg.</i>	<i>1.014</i>	<i>357.7</i>	<i>4.5</i>	<i>8.4</i>	<i>5.1</i>	<i>8.0</i>



Line Quality Analysis Summary

Horizontal	Target		Density (OD)			
	Average Line Width (points)	Average Line Width (μm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	0.88	0.89	0.20	0.21
C Average	1.014	357.7	0.79	0.83	0.21	0.20
M Average	1.014	357.7	0.64	0.67	0.19	0.19
Y Average	1.014	357.7	0.68	0.64	0.19	0.18
All Color Avg.	1.014	357.7	0.75	0.76	0.20	0.20



Line Quality Analysis Summary

Horizontal	Target		Contrast			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	0.84	0.84	0.91	0.91
C Average	1.014	357.7	0.79	0.81	0.86	0.88
M Average	1.014	357.7	0.72	0.74	0.79	0.78
Y Average	1.014	357.7	0.68	0.72	0.75	0.78
All Color Avg.	1.014	357.7	0.76	0.78	0.83	0.84



Line Quality Analysis Summary

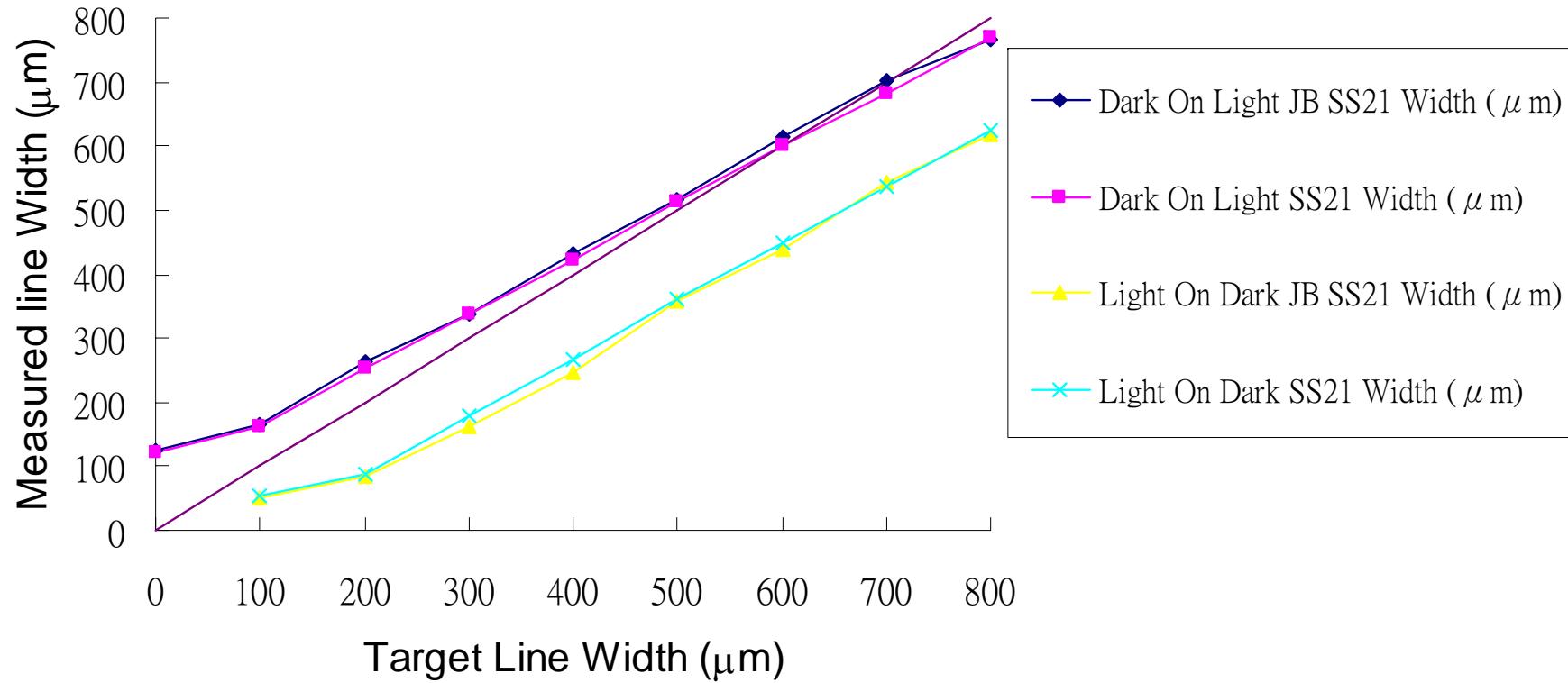
Horizontal	Target		Fill			
	Average Line Width (points)	Average Line Width (µm)	Dark on Light		Light on Dark	
			SS21	JB SS21	SS21	JB SS21
K Average	1.014	357.7	1.000	1.000	1.000	1.000
C Average	1.014	357.7	1.000	1.000	1.000	1.000
M Average	1.014	357.7	1.000	1.000	1.000	1.000
Y Average	1.014	357.7	1.000	1.000	1.000	1.000
<i>All Color Avg.</i>	<i>1.014</i>	<i>357.7</i>	<i>1.000</i>	<i>1.000</i>	<i>1.000</i>	<i>1.000</i>



Line Quality Analysis Summary

Horizontal

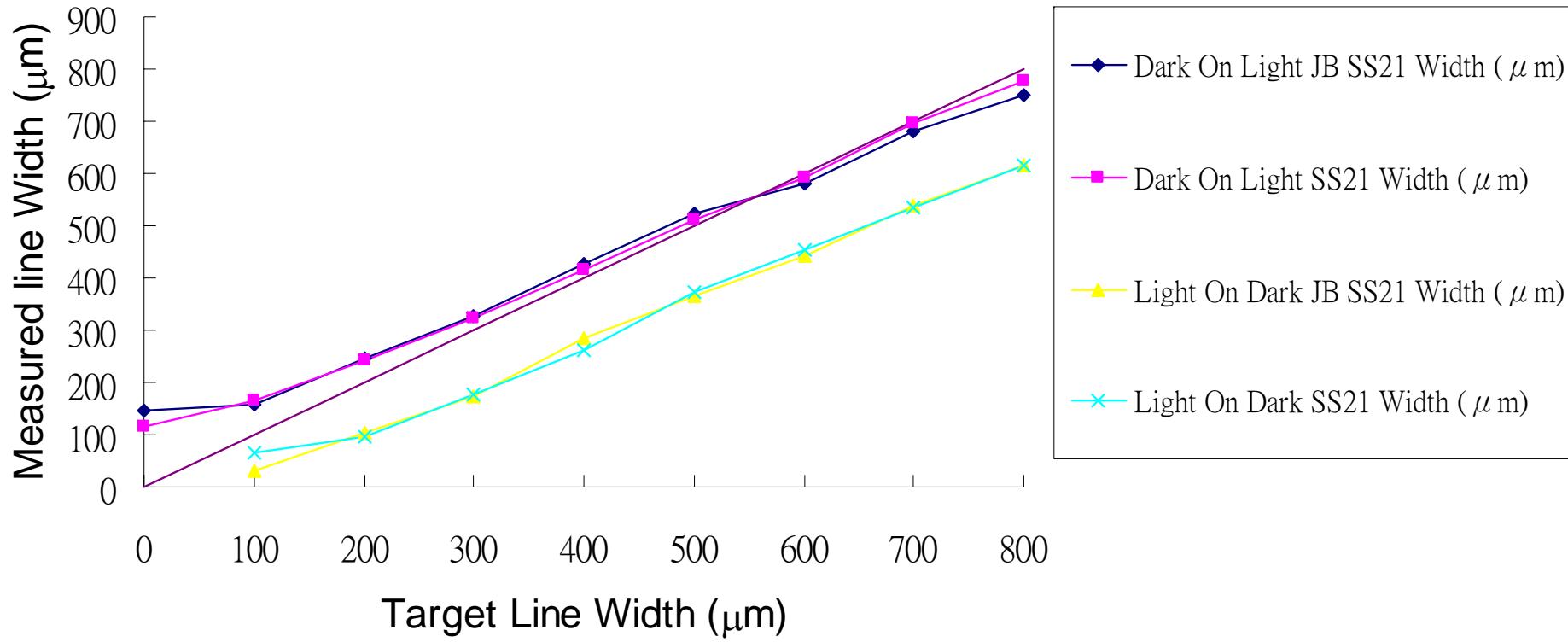
CYAN



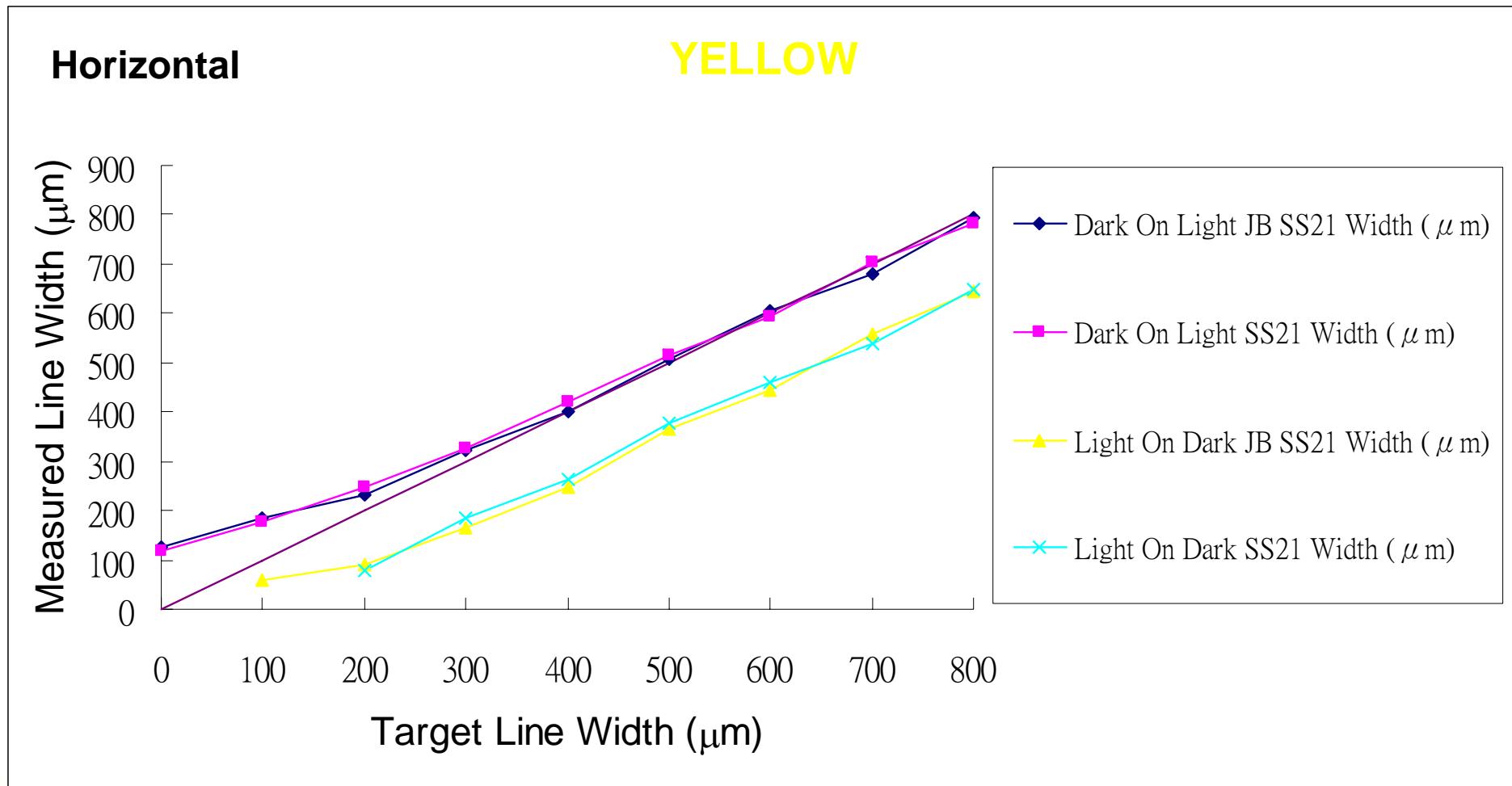
Line Quality Analysis Summary

Horizontal

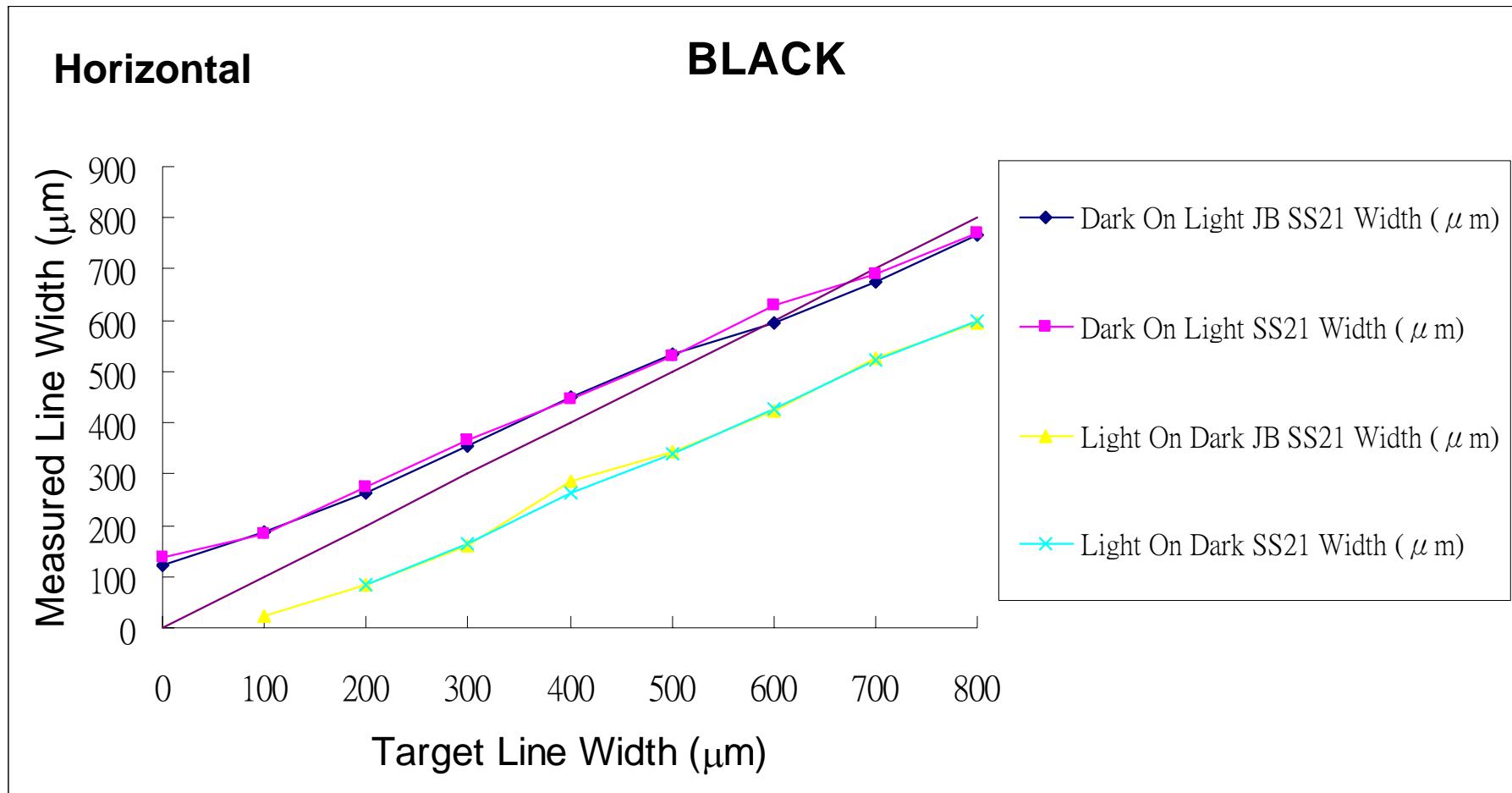
MAGENTA



Line Quality Analysis Summary



Line Quality Analysis Summary



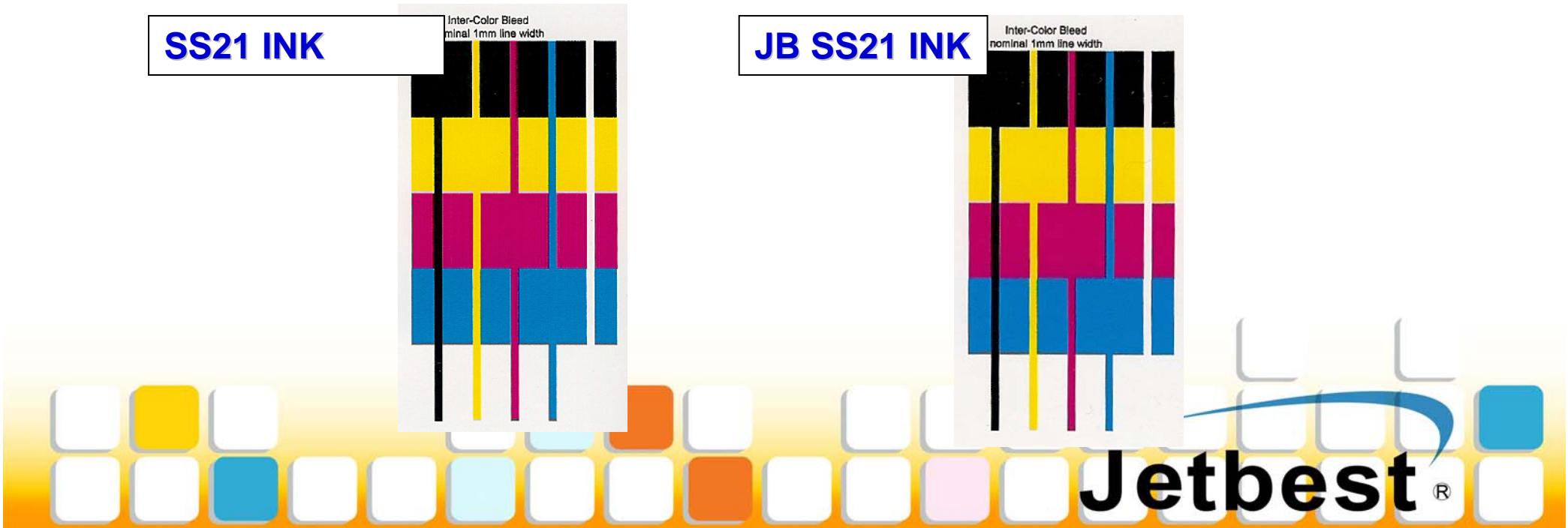
These results again suggest that the line quality for the two ink types are very similar.



Intercolor Bleed*

Measurements:	Intercolor Bleed
Instrument:	Personal PIAS-II

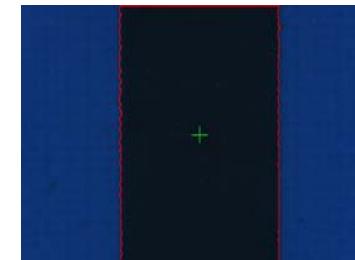
- Intercolor bleed in inkjet printing is measured by means of the line quality tool.
- The ICB between two colors can be obtained by the difference in line width of one color on another and vice versa.
- **The Intercolor Bleed between Black and Y appears to be lower in JB SS21 ink than the Mimaki SS21 ink by about 40%. Bleeding between Black and CMW to be similar in JB SS21 ink and Mimaki SS21 ink.**



Intercolor Bleed

1440 x 1440 dpi		Line Width (μm)	
Line Color	Field Color	SS21	JBSS21
Black	Cyan	1080.3	1085.0
Cyan	Black	969.1	966.1
	ICB ((μm)	111.2	118.9

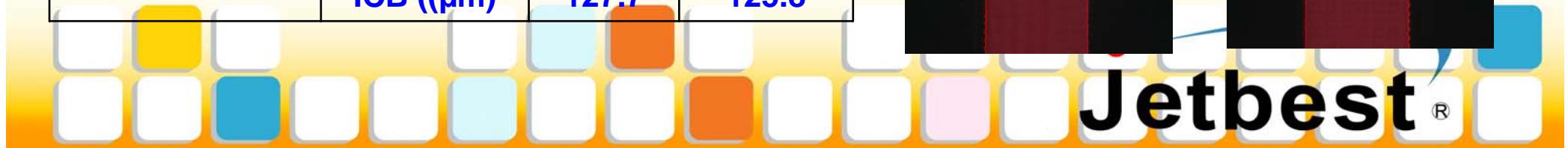
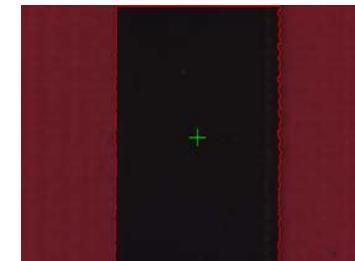
SS21



JB SS21



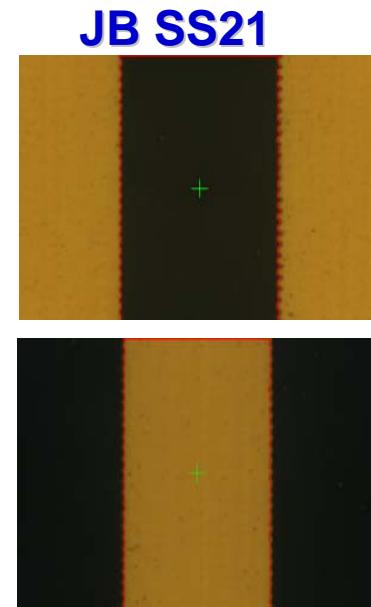
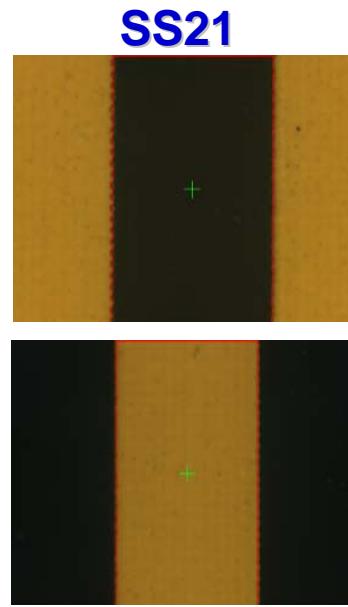
1440 x 1440 dpi		Line Width (μm)	
Line Color	Field Color	SS21	JBSS21
Black	Magenta	1077.0	1076.4
Magenta	Black	949.3	950.6
	ICB ((μm)	127.7	125.8



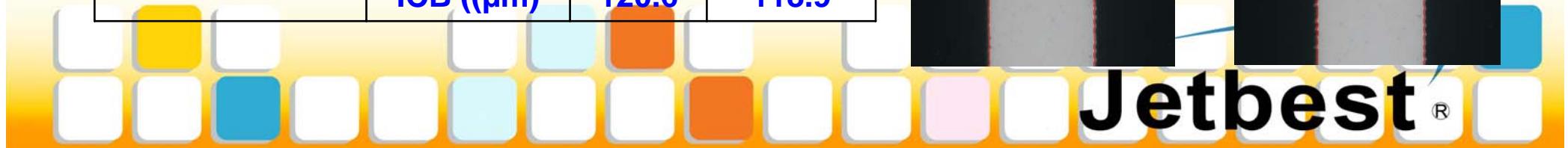
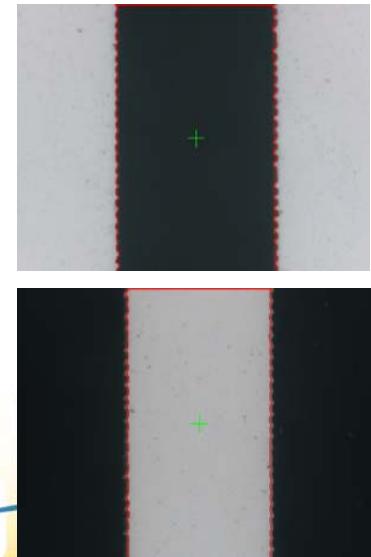
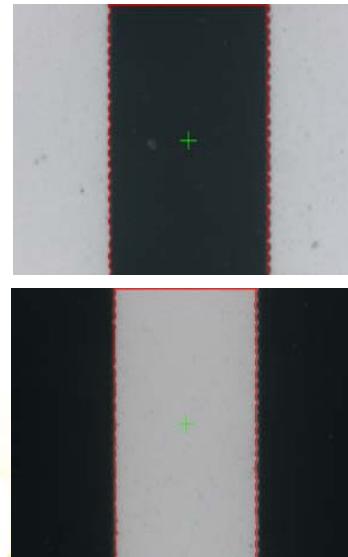
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Intercolor Bleed

1440 x 1440 dpi		Line Width (μm)	
Line Color	Field Color	SS21	JBSS21
Black	Yellow	1092.6	1071.3
Yellow	Black	964.5	979.6
	ICB ((μm)	128.1	91.7



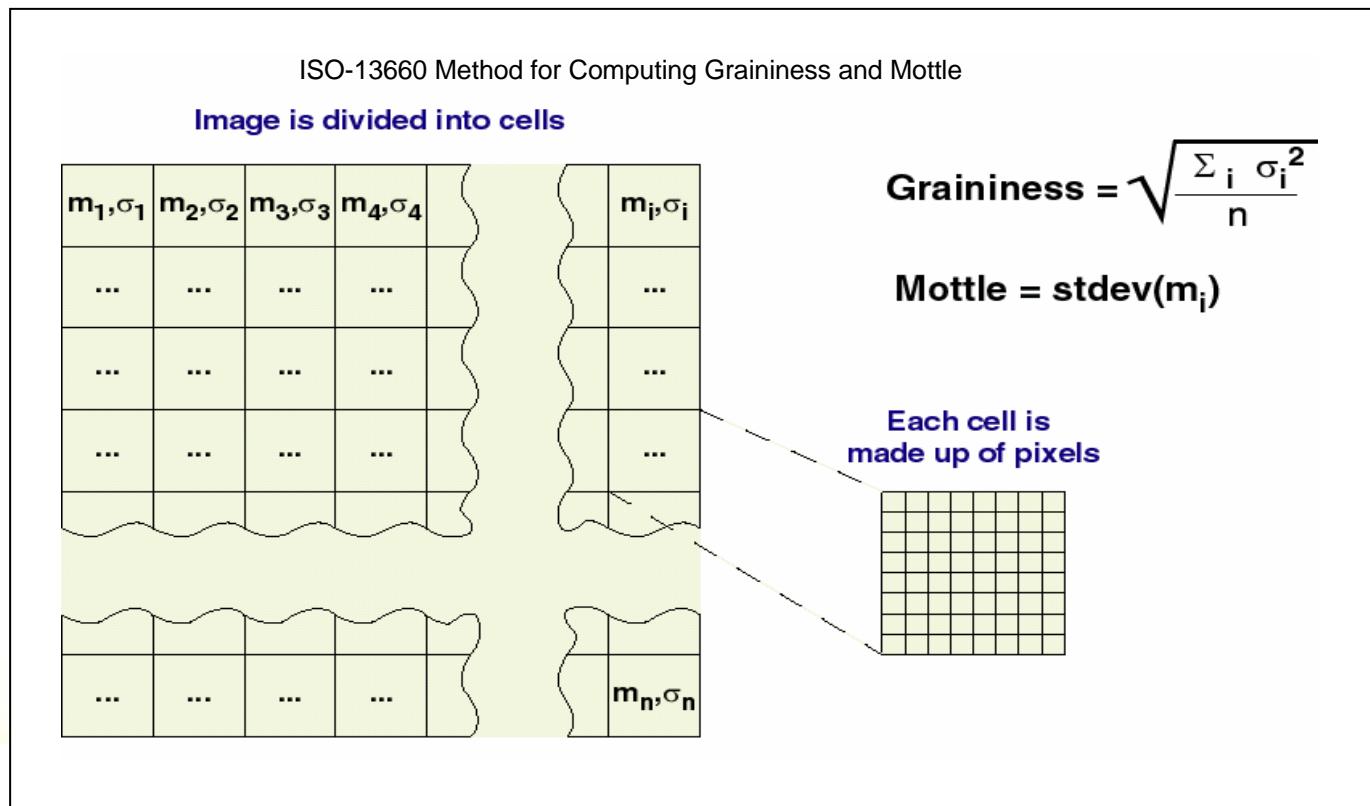
1440 x 1440 dpi		Line Width (μm)	
Line Color	Field Color	SS21	JBSS21
Black	White	1078.5	1083.4
White	Black	957.9	964.5
	ICB ((μm)	120.6	118.9



Graininess and Mottle

Measurements:	Area Properties*
Instrument:	Personal PIAS-II

*Area properties include: graininess, mottle, reflectance, density and L*a*b* estimation.
Graininess and mottle are computed using the ISO-13660 algorithm.



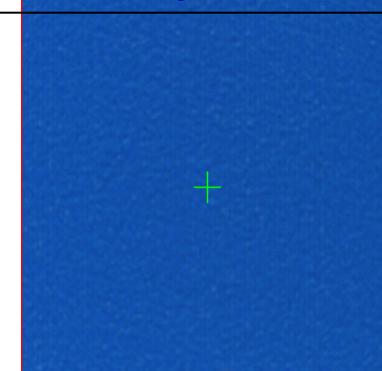
Jetbest®

Graininess and Mottle

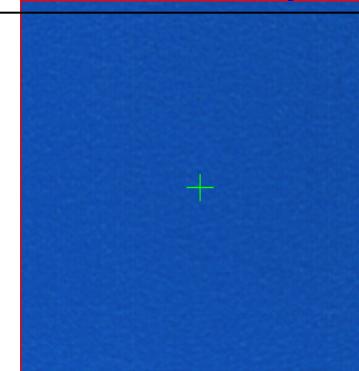
Graininess & Mottle

- Graininess and mottle are measurements of the non-uniformity in color. Both appears as "noise" in the color field, with graininess of smaller scale and mottle of larger scale.
- **The mottle for the two ink types are quite similar, with Mimaki SS21 ink slightly higher in graininess than JB SS21 ink.**

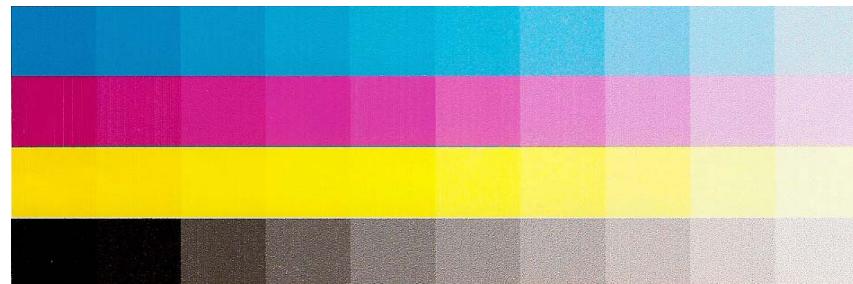
SS21 INK, Cyan 80%



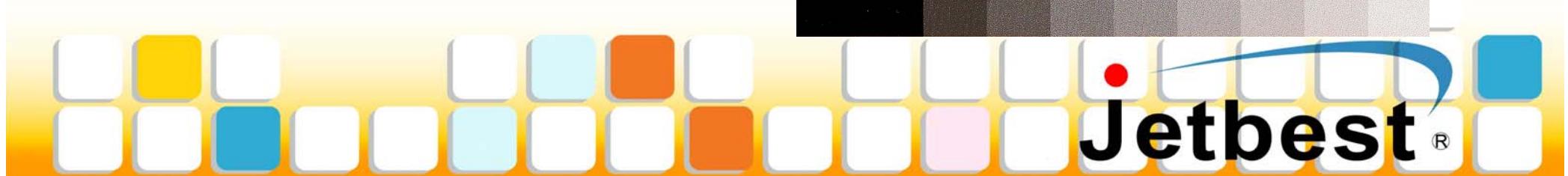
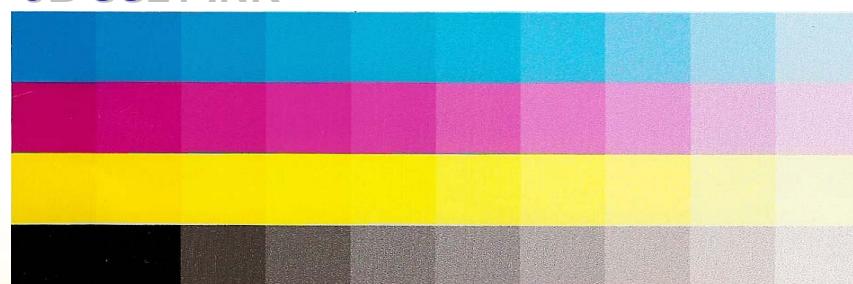
JB SS21 INK, Cyan 80%



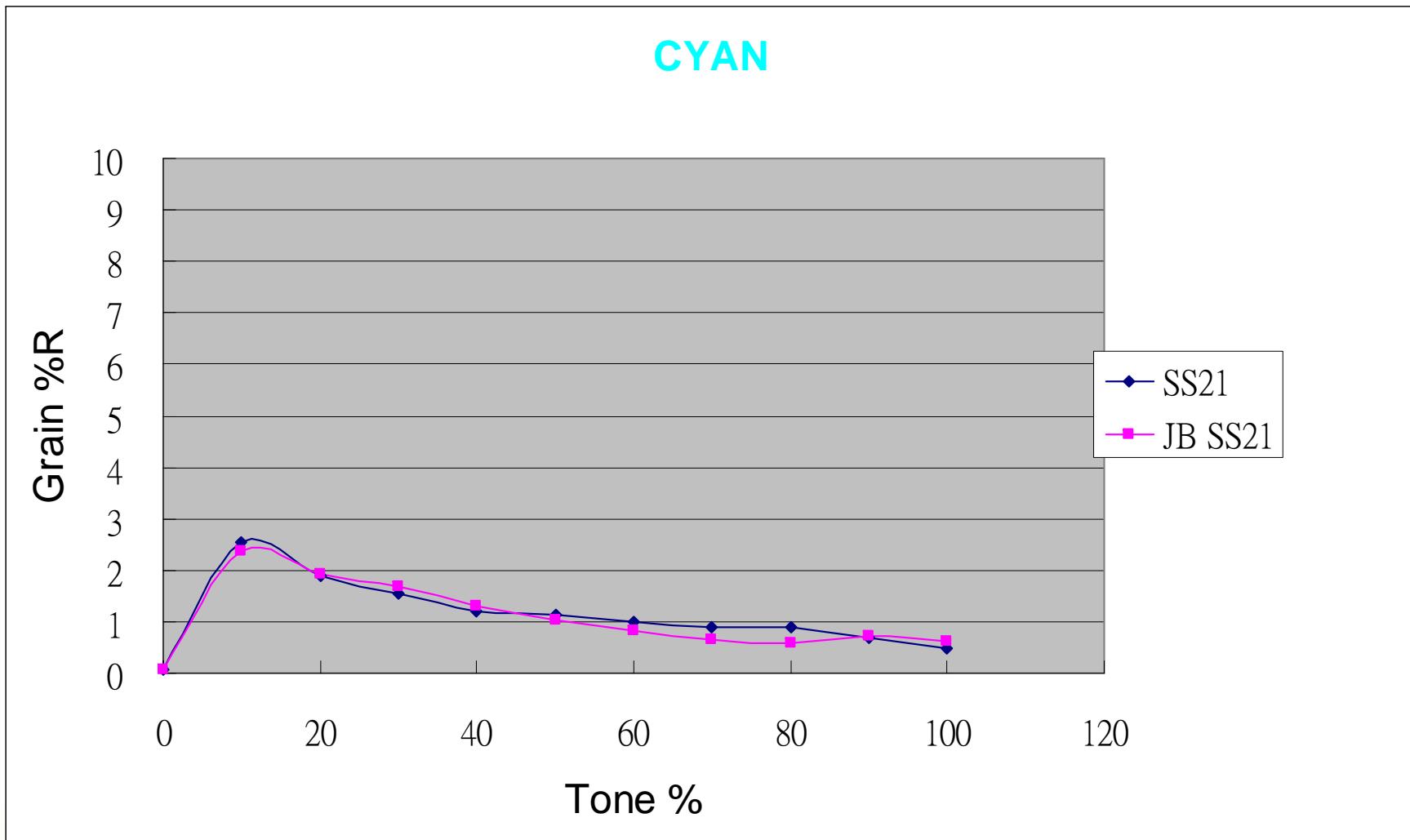
SS21 INK



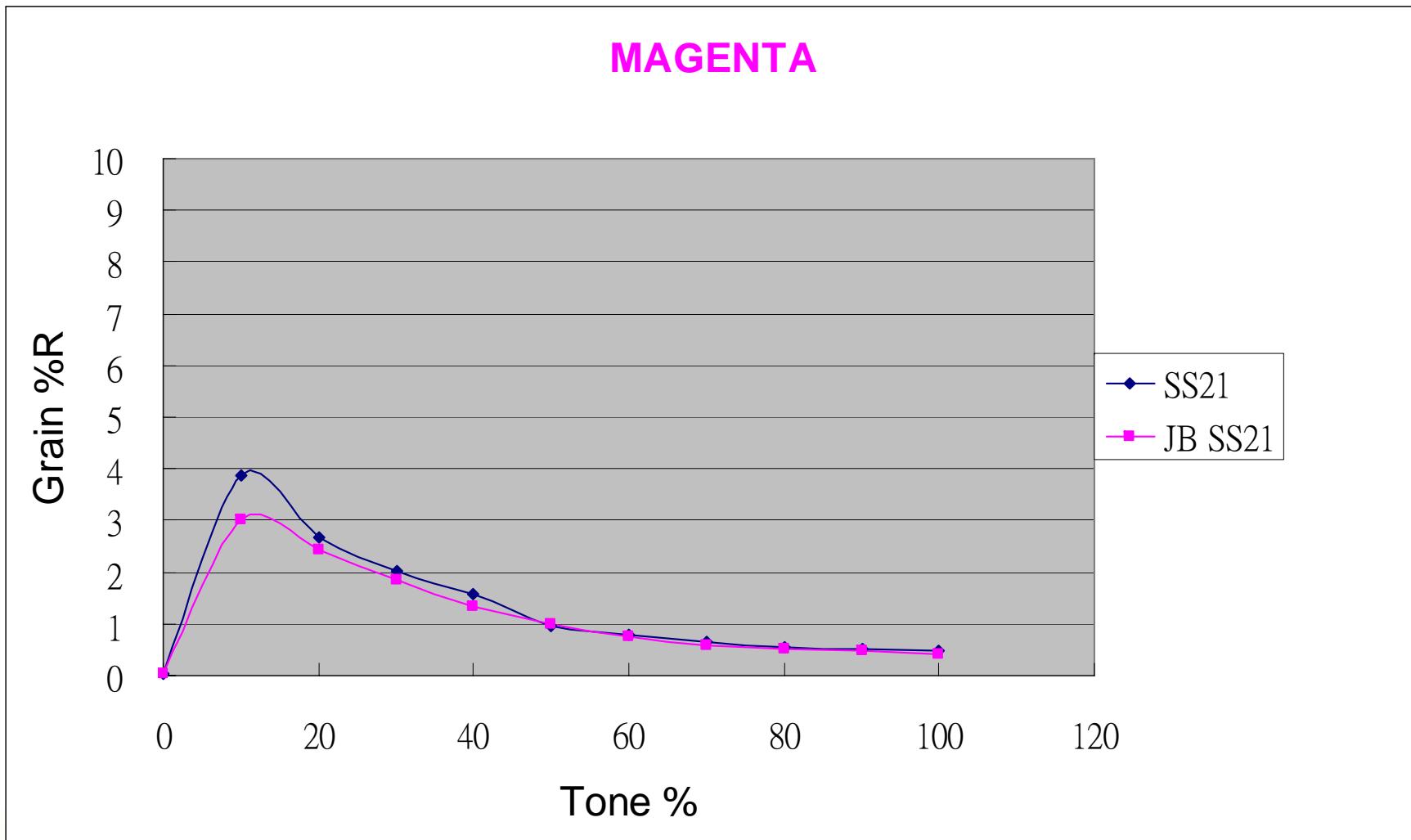
JB SS21 INK



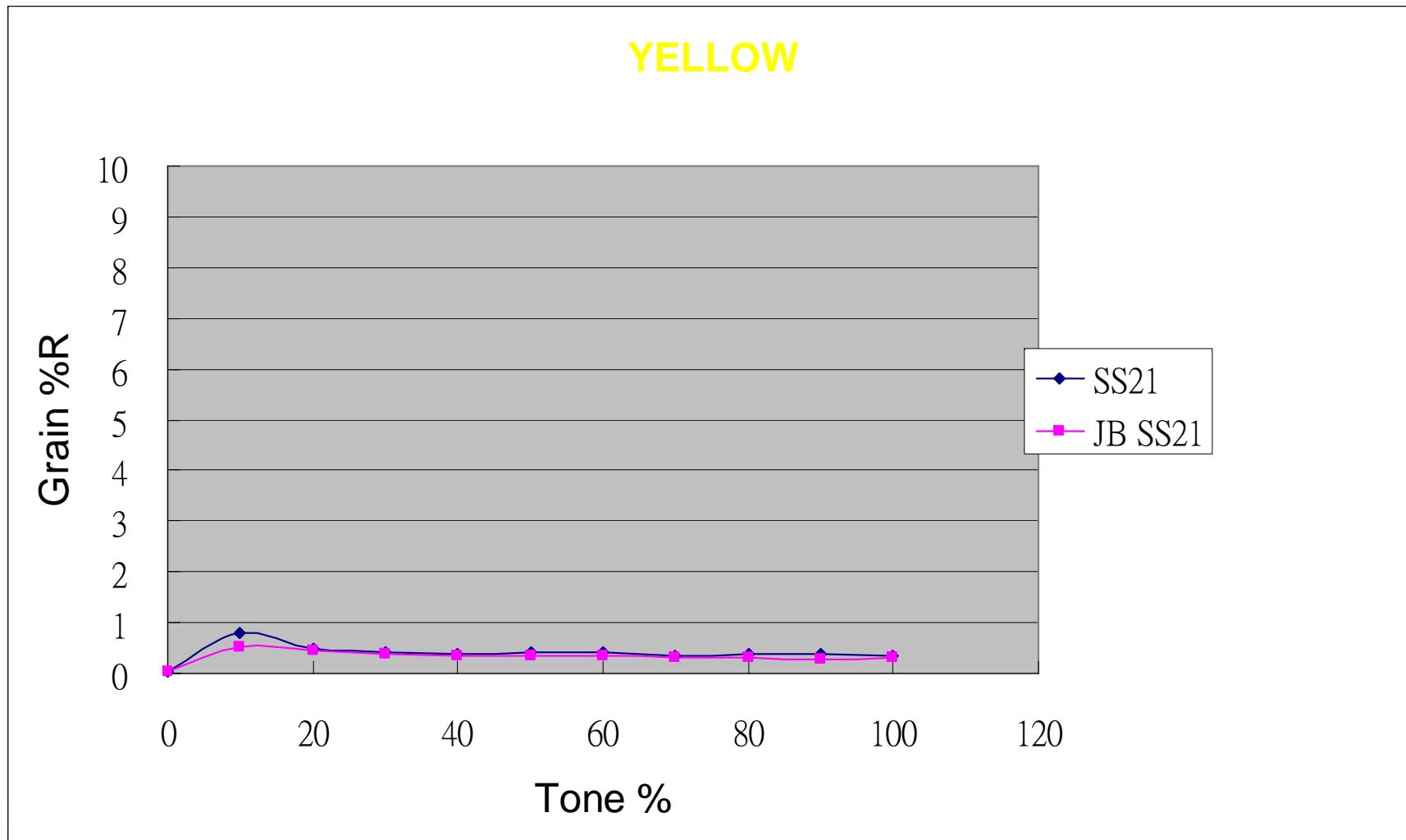
Graininess and Mottle



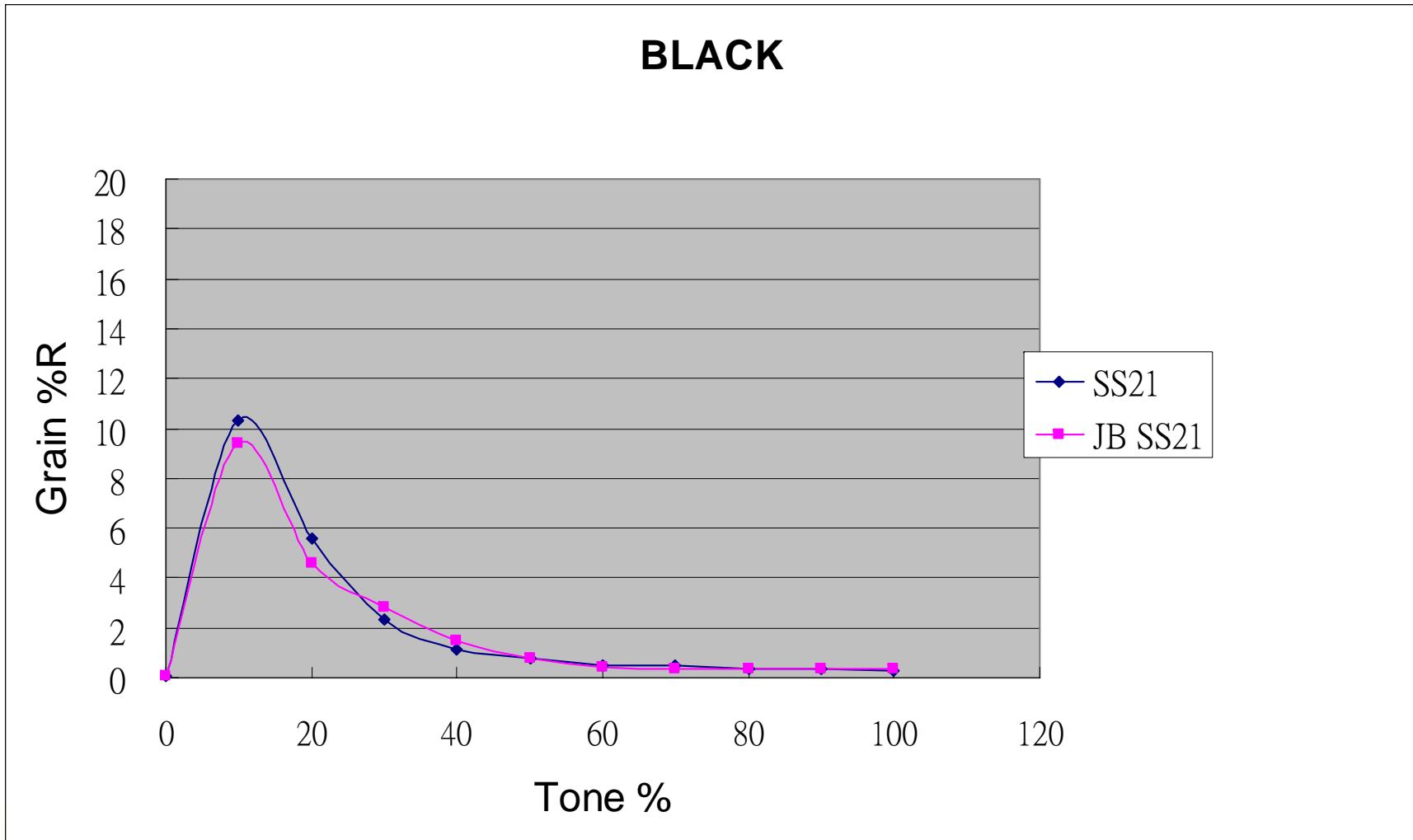
Graininess and Mottle



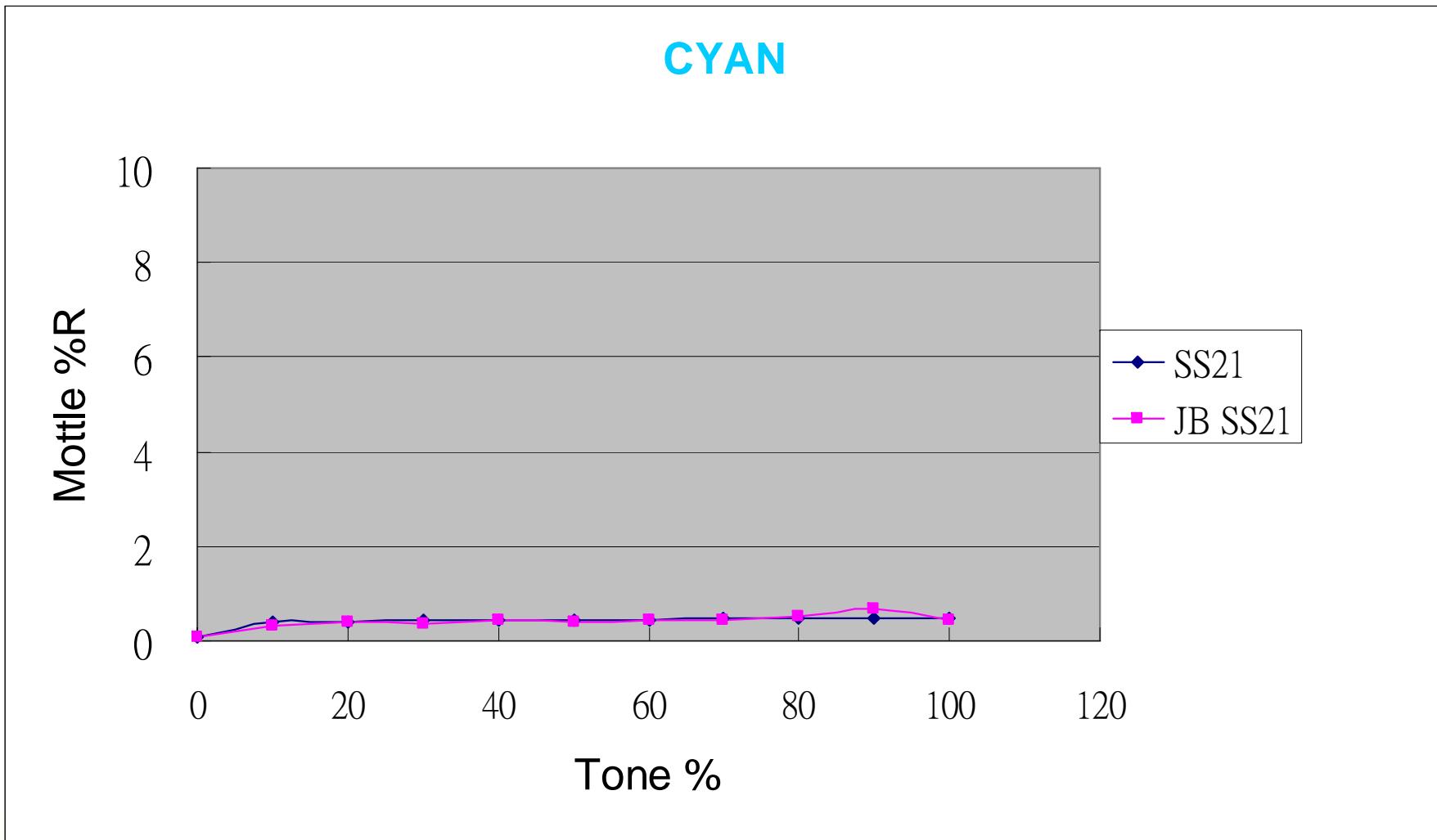
Graininess and Mottle



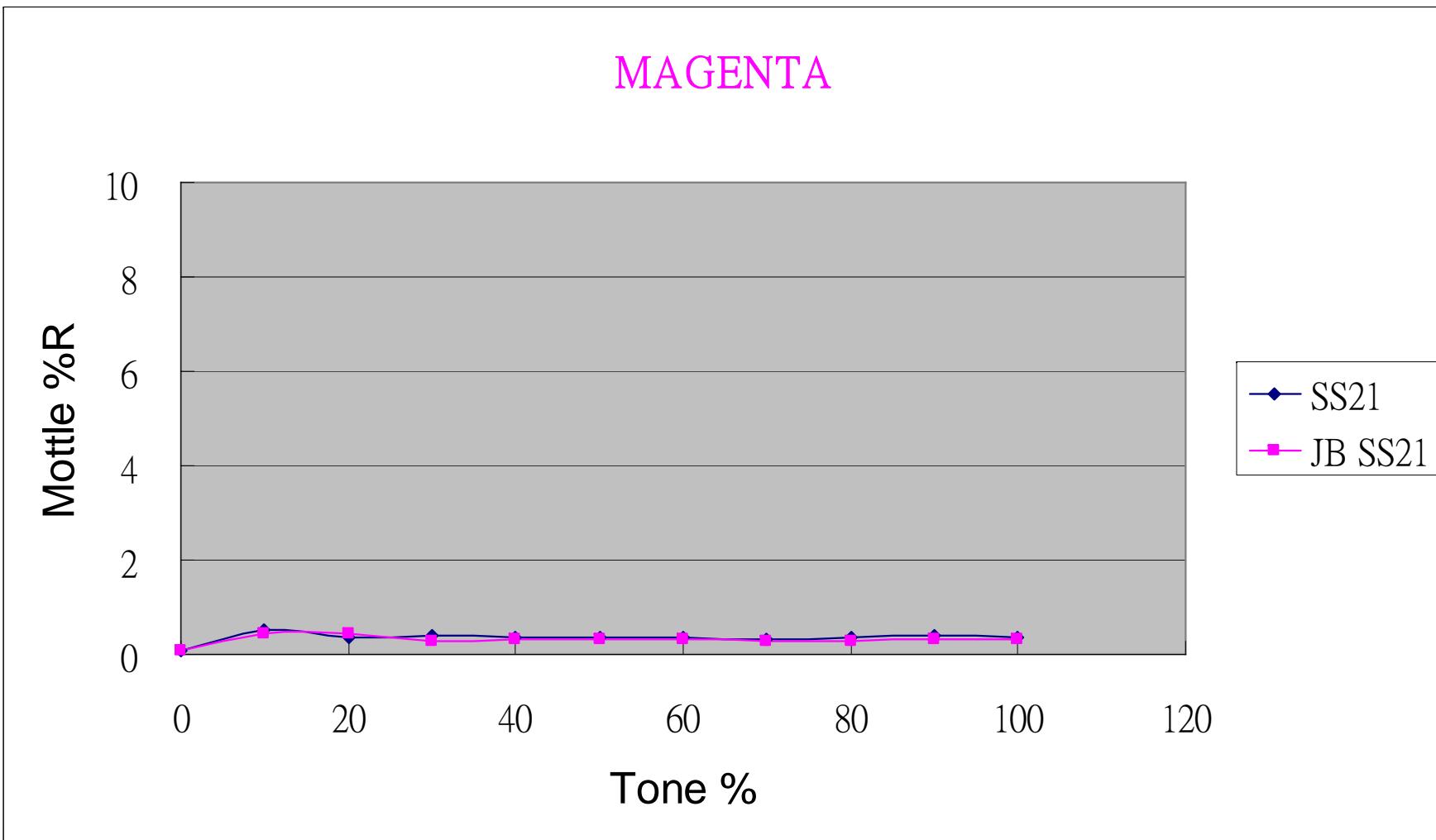
Graininess and Mottle



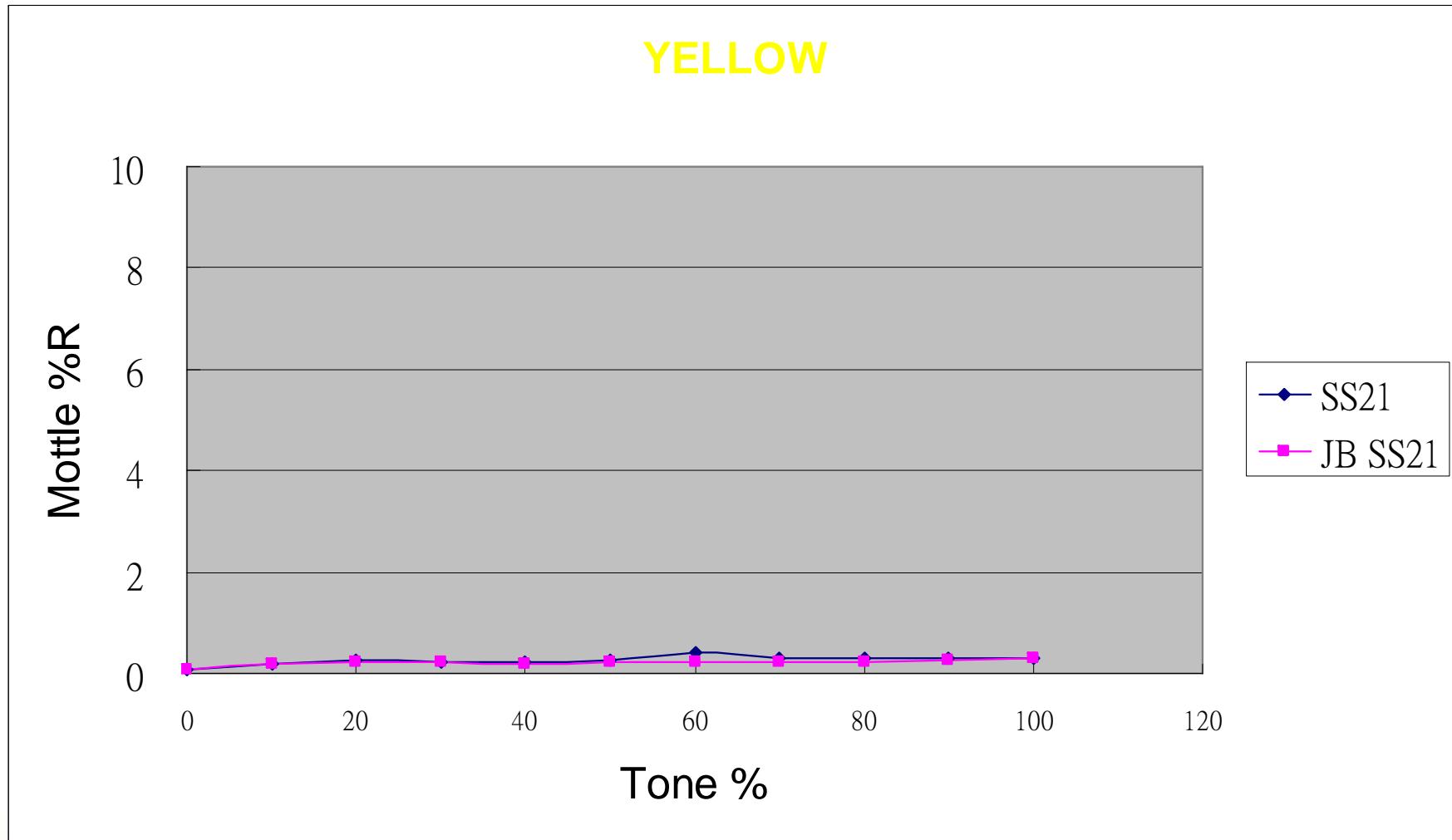
Graininess and Mottle



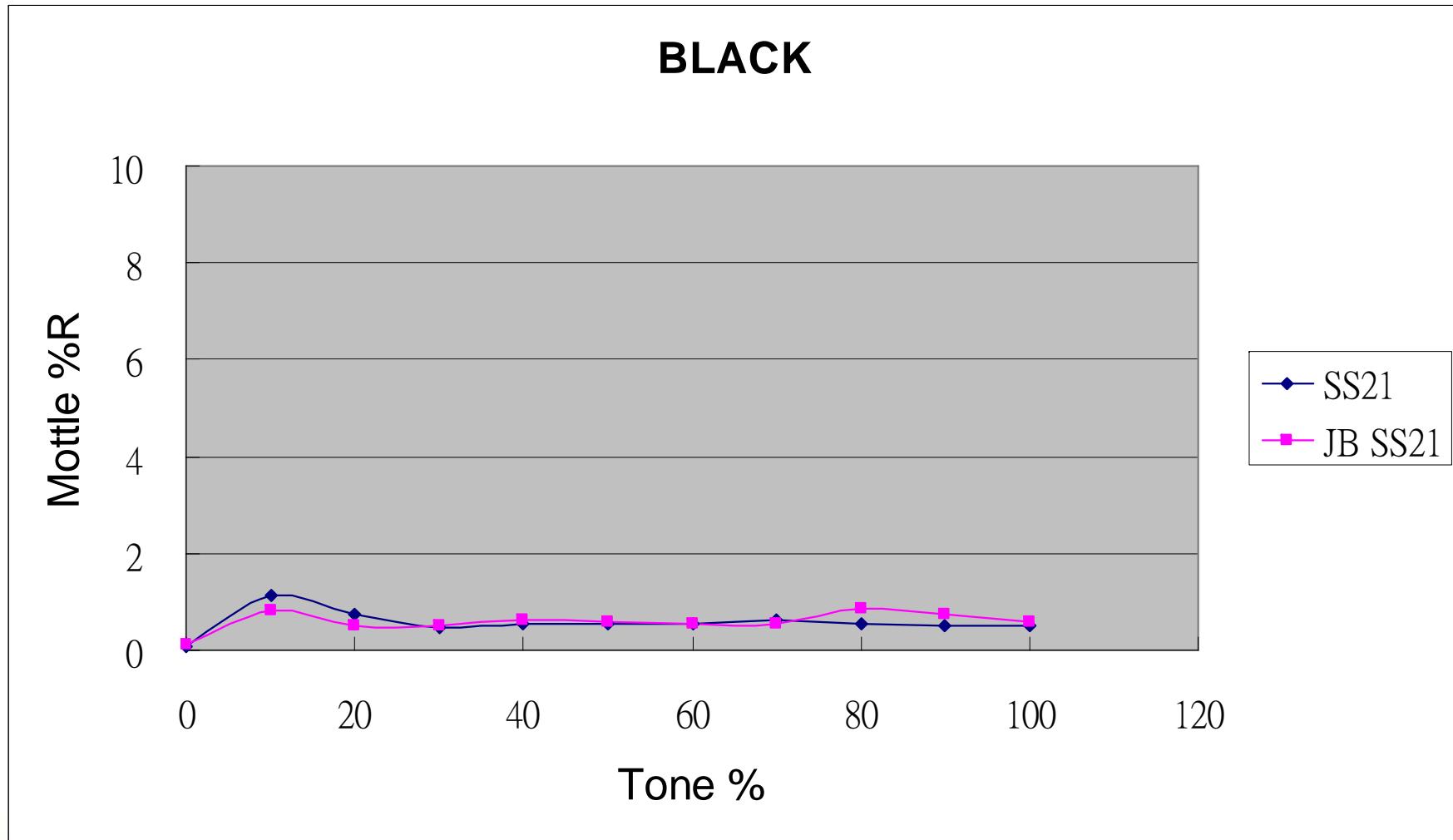
Graininess and Mottle



Graininess and Mottle



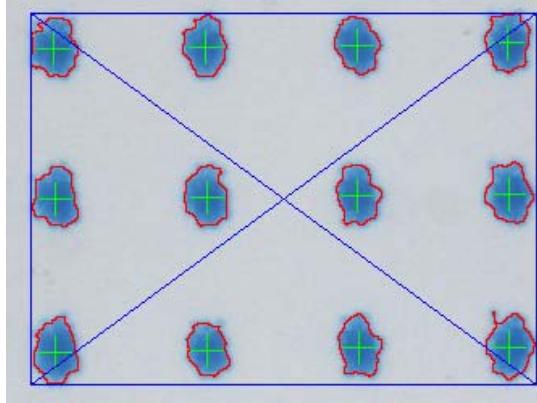
Graininess and Mottle



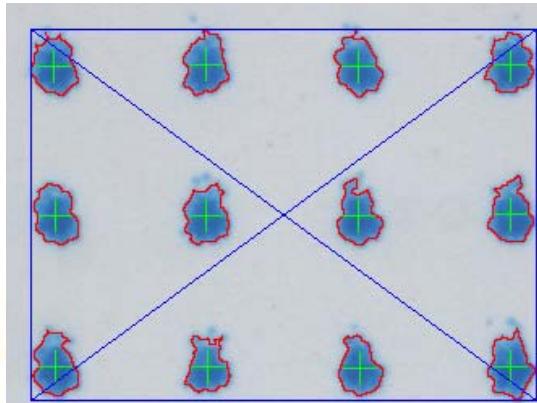
Dot Analysis

Measurements:	Area Properties*
Instrument:	Personal PIAS-II

SS21 INK



JB SS21 INK

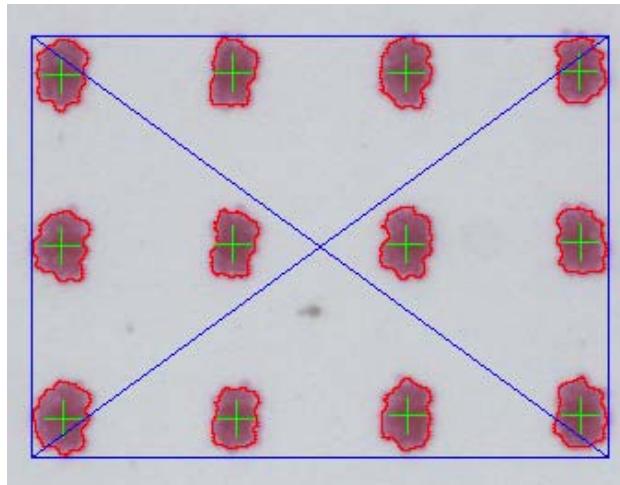


Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	24751.78	21160.73	26986.36	1534.219
Diameter (μm)	177.437	164.142	185.365	5.565
Perimeter (μm)	644.347	592.119	727.383	33.927
BoxRatio	1.347	1.234	1.536	0.089
Circularity	1.336	1.244	1.56	0.08

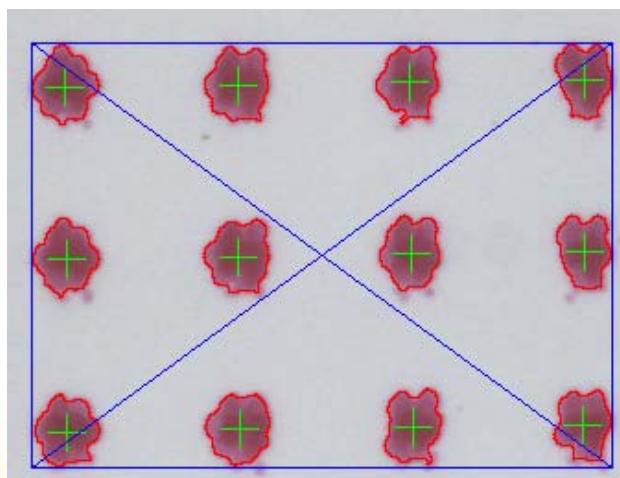
Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	24575.68	21189.29	26415.22	1454.748
Diameter (μm)	176.812	164.253	183.393	5.308
Perimeter (μm)	705.153	644.258	797.229	45.904
BoxRatio	1.457	1.276	1.655	0.097
Circularity	1.622	1.263	2.119	0.229

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SS21 INK



JB SS21 INK



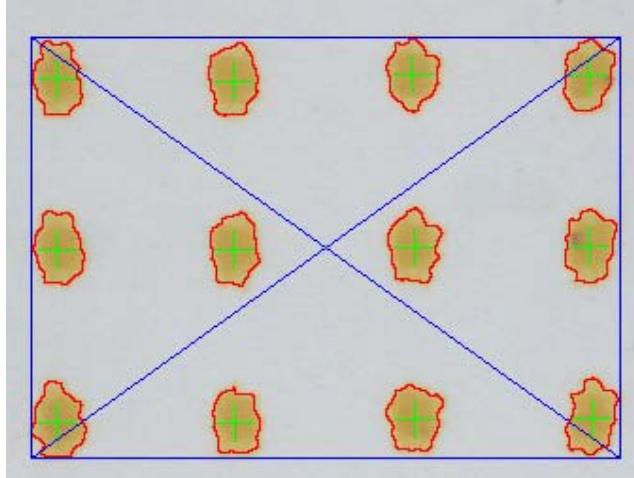
Dot Analysis

Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	25689.4	22531.47	29099.58	1839.266
Diameter (μm)	180.739	169.375	192.486	6.483
Perimeter (μm)	675.8	643.721	714.326	23.544
BoxRatio	1.326	1.182	1.429	0.074
Circularity	1.418	1.322	1.519	0.061

Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	30615.48	27928.74	33326.02	1737.855
Diameter (μm)	197.356	188.574	205.99	5.616
Perimeter (μm)	730.882	690.896	799.822	30.186
BoxRatio	1.219	1.108	1.367	0.089
Circularity	1.393	1.205	1.643	0.113



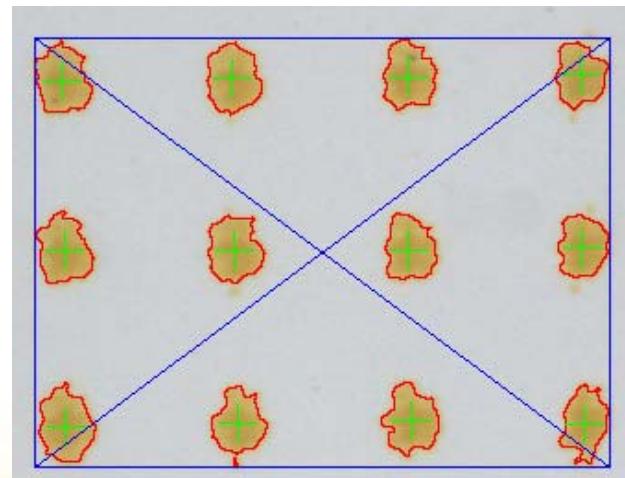
SS21 INK



Dot Analysis

Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	25637.04	23245.4	27043.48	897.929
Diameter (μm)	180.643	172.038	185.561	3.2
Perimeter (μm)	654.189	620.828	688.302	21.029
BoxRatio	1.44	1.226	1.556	0.078
Circularity	1.329	1.224	1.453	0.058

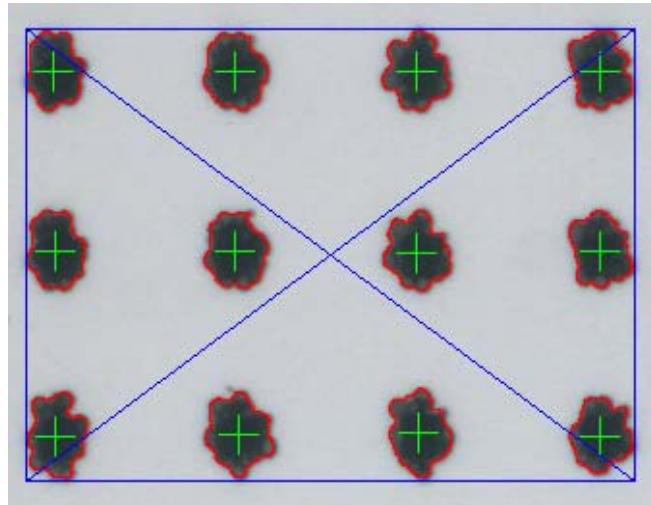
JB SS21 INK



Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	25682.26	23074.05	28985.35	1766.242
Diameter (μm)	180.723	171.402	192.108	6.221
Perimeter (μm)	690.3	604.64	753.184	42.762
BoxRatio	1.323	1.188	1.572	0.098
Circularity	1.485	1.261	1.909	0.184



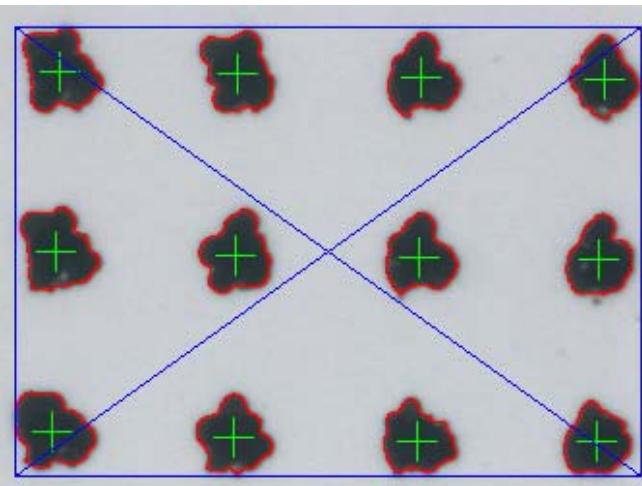
SS21 INK



Dot Analysis

Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	30724.95	28842.57	32811.99	1189.806
Diameter (μm)	197.751	191.634	204.396	3.836
Perimeter (μm)	716.145	671.892	787.078	32.068
BoxRatio	1.267	1.177	1.438	0.089
Circularity	1.33	1.219	1.567	0.088

JB SS21 INK



Dot Summary	Mean	Min	Max	Stdv
Count	12			
Area (μm^2)	33699.64	28928.24	38694.73	2983.272
Diameter (μm)	206.941	191.918	221.963	9.127
Perimeter (μm)	742.963	656.241	814.176	44.344
BoxRatio	1.103	0.953	1.229	0.073
Circularity	1.305	1.185	1.363	0.056

The results here show that the dot characteristics for the two ink types are quite similar.