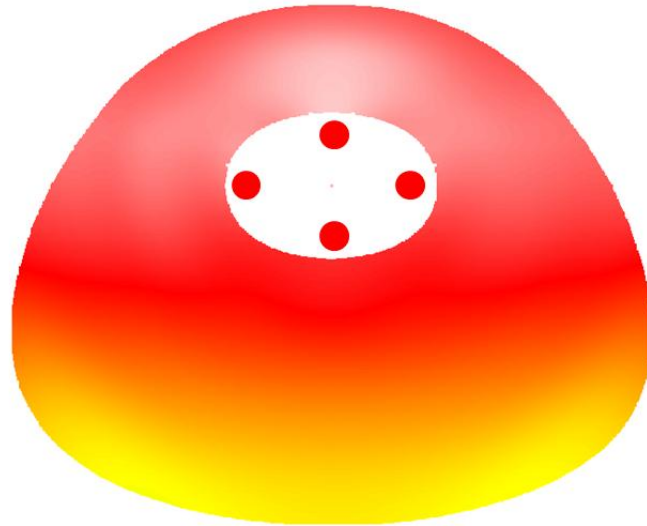
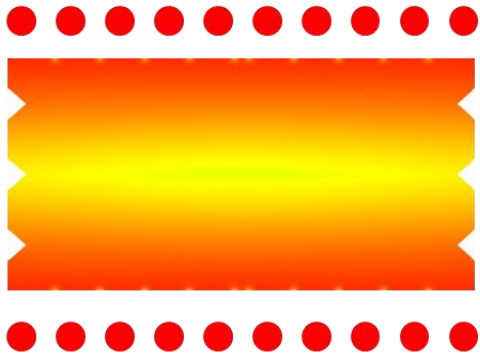
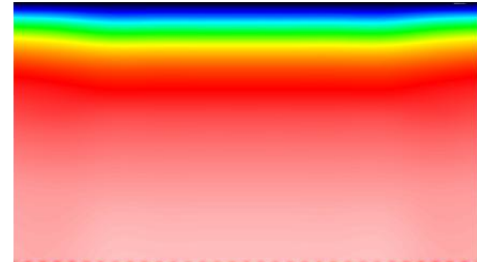
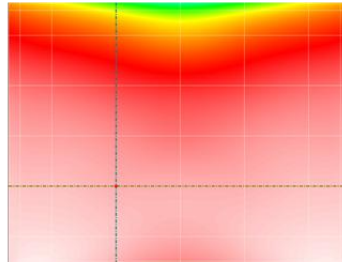
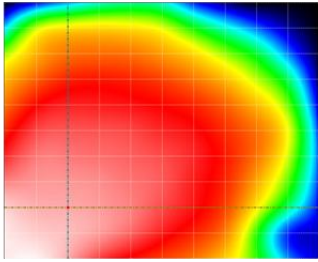


Quick Start for BacklightFly V4



Software overview

The screenshot shows the Febees! software interface. Callout A points to the window title bar, B to the menu bar, C to the toolbar, D to the X and Y profile charts, and E to the main design area. Callouts F1, F2, and F3 point to the Layers, Properties, and Active Dot panels on the right side of the interface.

A Head title

B Functions

C Tool Bar

D X,Y profile

E Design Area

F1 Layers

F2 Property of layer

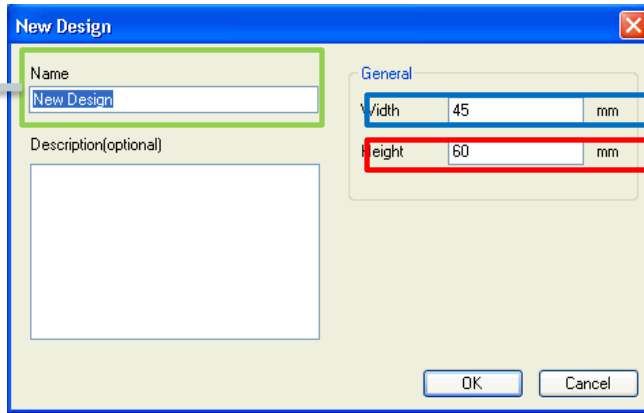
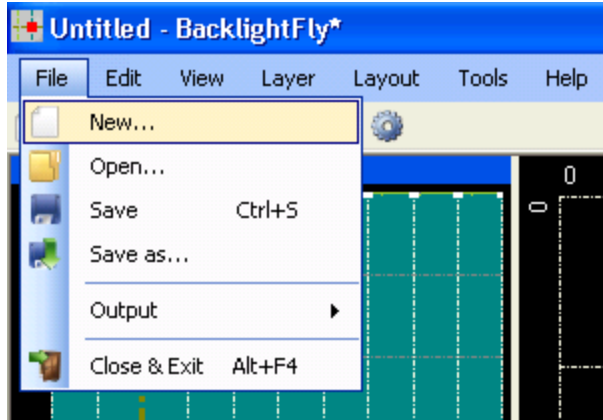
F3 Dot information

Layers	
New Design - (422.4,238.16)	
Main - (0,0)x(422.4,238.16)	

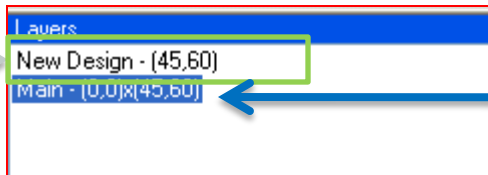
Properties	
Density	
Dots	13 x 15 (195) dots
Negative	False
Layout	
Height	238.16
Width	422.4
X	0
Y	0
Misc	
Description	
Name	Main

Active Dot	
Density	0.60308
Density(old)	0.60308
Grayscale	101
Grayscale(old)	101
X (0-1)	0.402983
X (mm)	170.220019
Y (0-1)	0.5967417
Y (mm)	142.120003

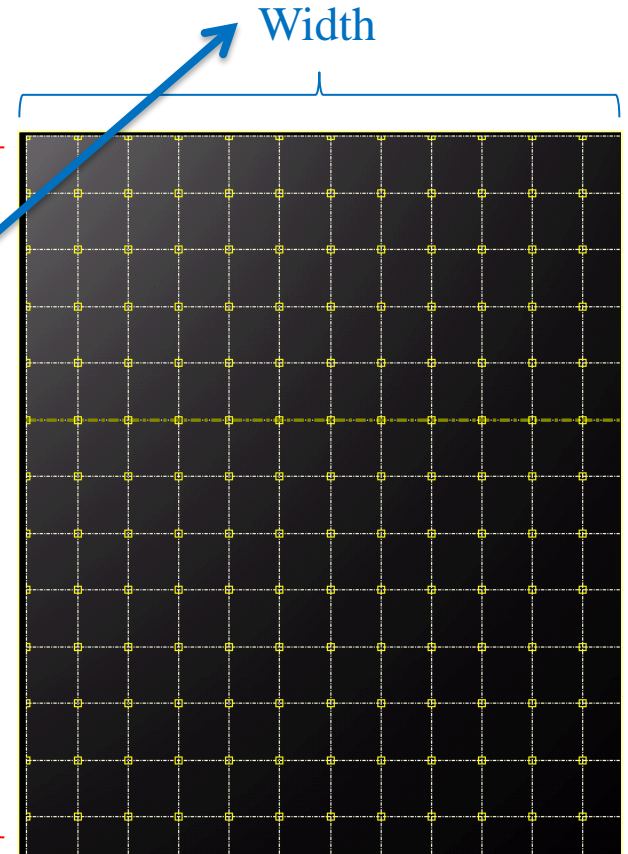
Create a new design file



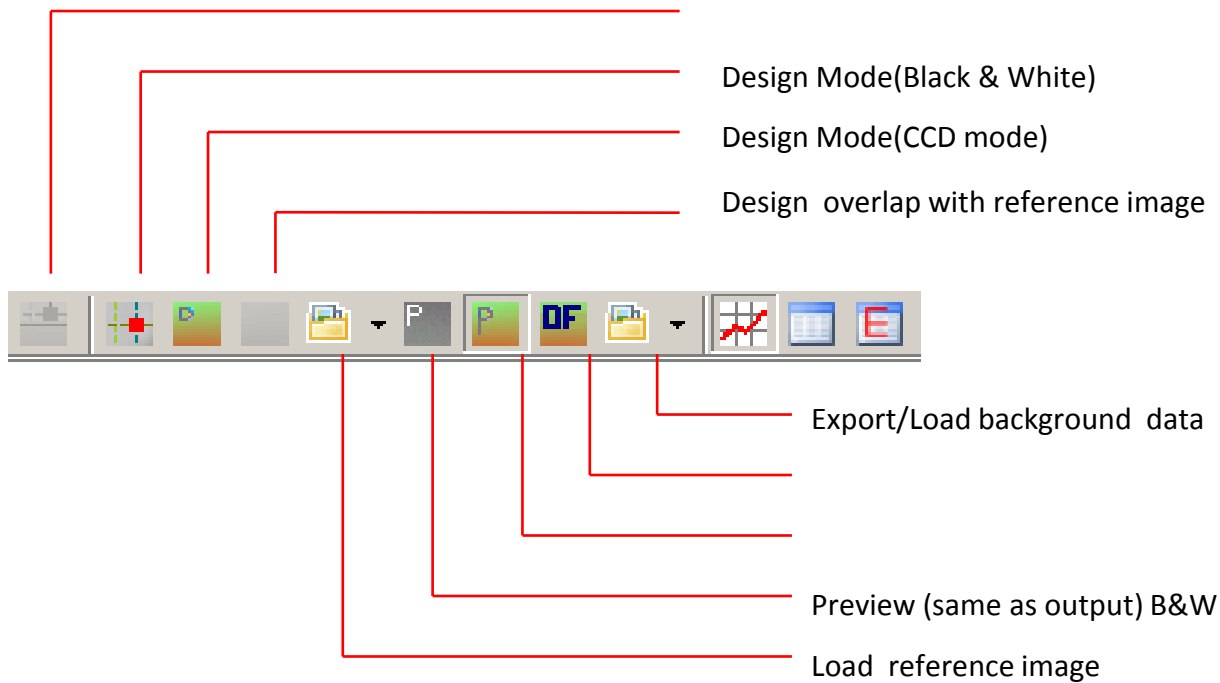
Design Name



Layer name : Main
(Auto created)



View








Design Mode : Mesh Edit

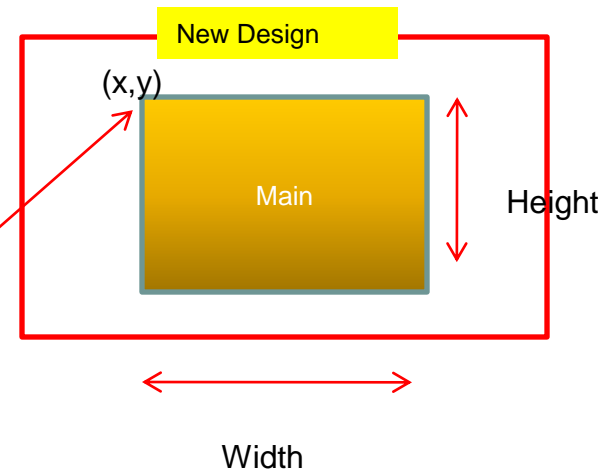
Preview Mode : Final result (same as output)

Details of layer setting

You define origin, Height, Width and name

Layers	
New Design -	(422.4,238.16)
Main -	(0,0)x(422.4,238.16)

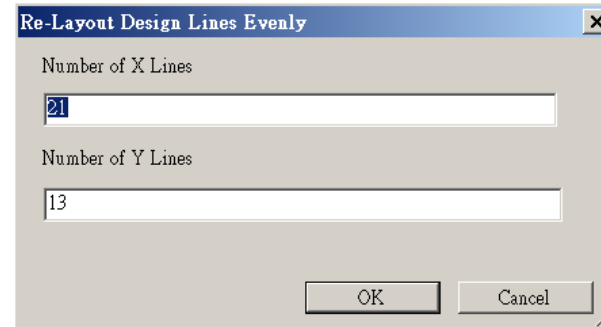
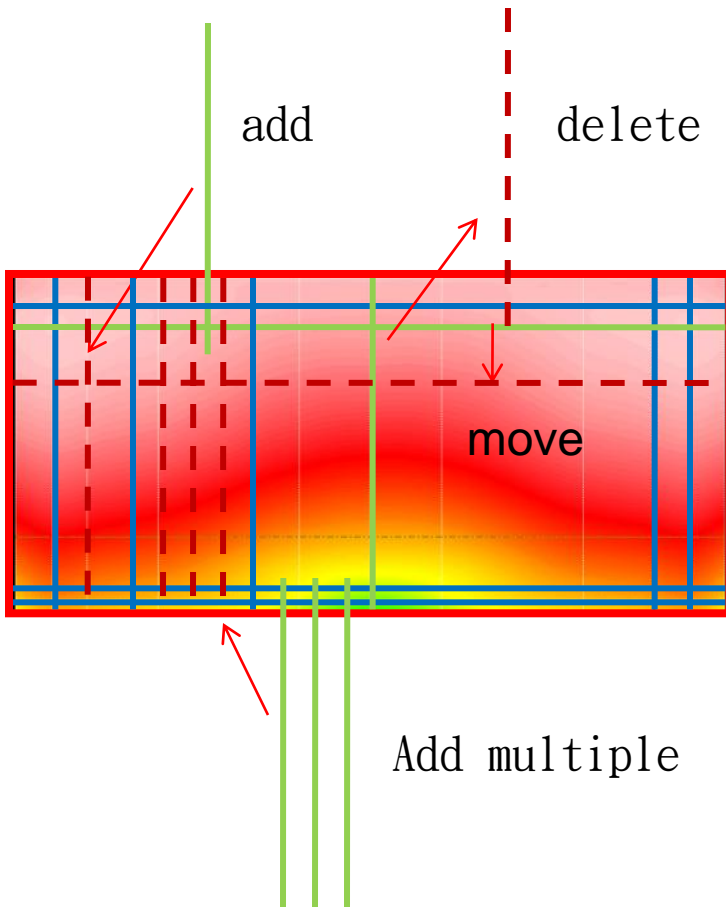
Properties	
    	
Density	
Dots	13 x 15 (195) dots
Negative	False
Layout	
Height	238.16
Width	422.4
X	0
Y	0
Misc	
Description	
Name	Main



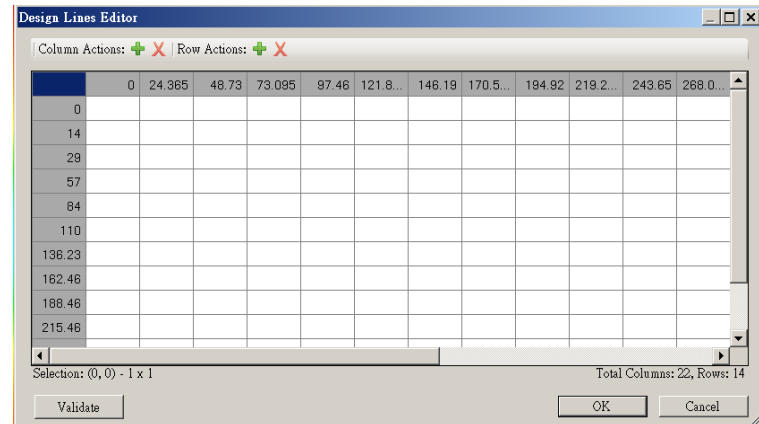
Design Line

Mesh edit:

add, delete, insert, edit table, reset



Reset



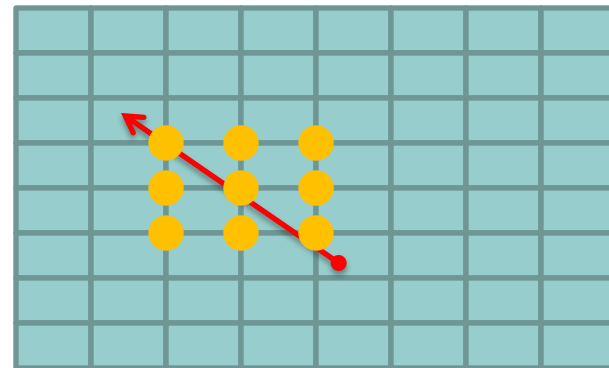
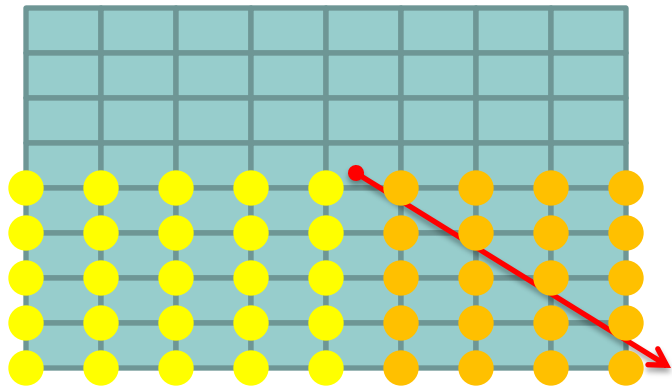
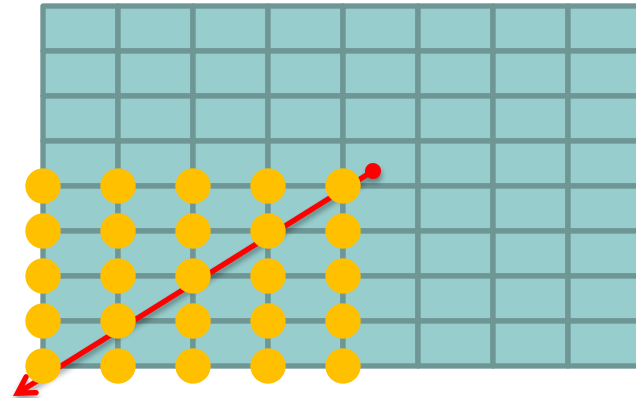
Edit table

Select dots in special area



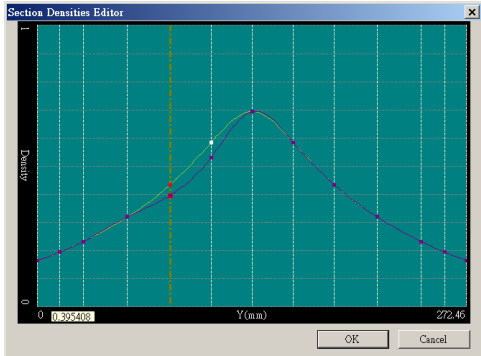
Select all dots

Unselect all dots



Density

Density Edit:



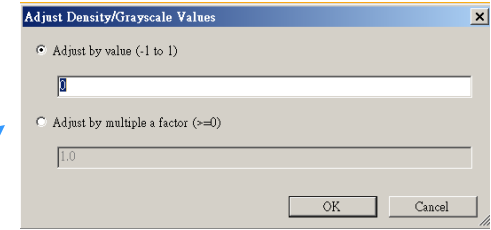
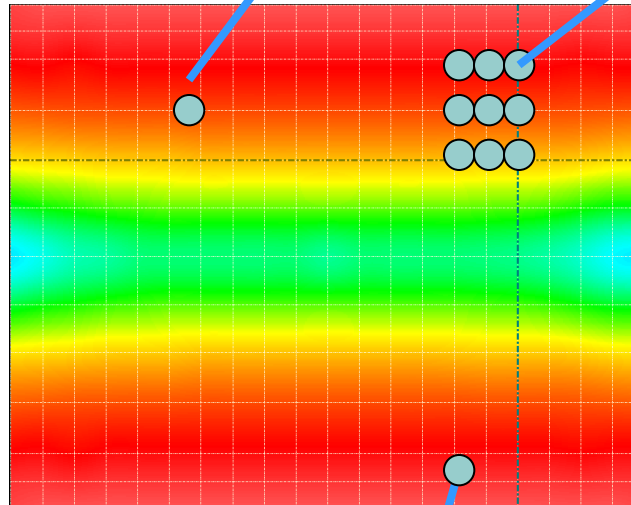
Curve edit



Gradient modify

Right mouse

- Undo Ctrl+Z
- Redo Ctrl+Y
- Unselect all dots
- Select all dots Ctrl+A
- Add single X design line
- Add single Y design line
- Move current X design line
- Move current Y design line
- Remove Current X Design Line
- Remove Current Y Design Line
- Adjust Density Values
- Adjust Density Value Gradiently
- Edit X Density Section - Y Profile...
- Edit Y Density Section - X Profile...



Selected modify

Active Dot	
Density	0.103242
Density(old)	0.103242
Grayscale	229

directly

行: + X	列: + X	0	0.058824	0.117647	0.176471	0.235294
0	0.6	0.633491	0.665239	0.697834	0.72816	
0.058824	0.633491	0.664176	0.693267	0.723133	0.75092	
0.117647	0.665239	0.693267	0.719837	0.747116	0.772496	
0.176471	0.697834	0.723133	0.747116	0.771739	0.794648	
0.235294	0.72816	0.75092	0.772496	0.794648	0.815257	
0.294118	0.758676	0.778881	0.798035	0.8177	0.835996	

Density Editor

BacklightFly Outputs--Dot

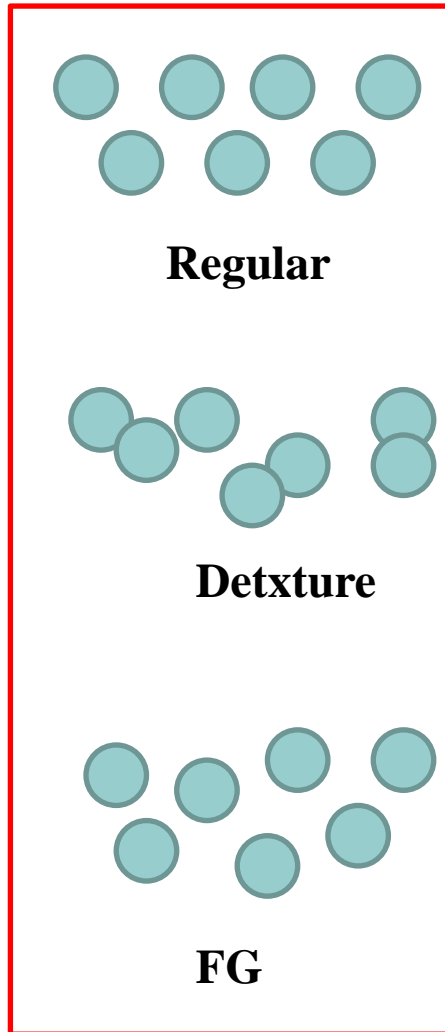


A: all dots with same size. It is typical for laser process.

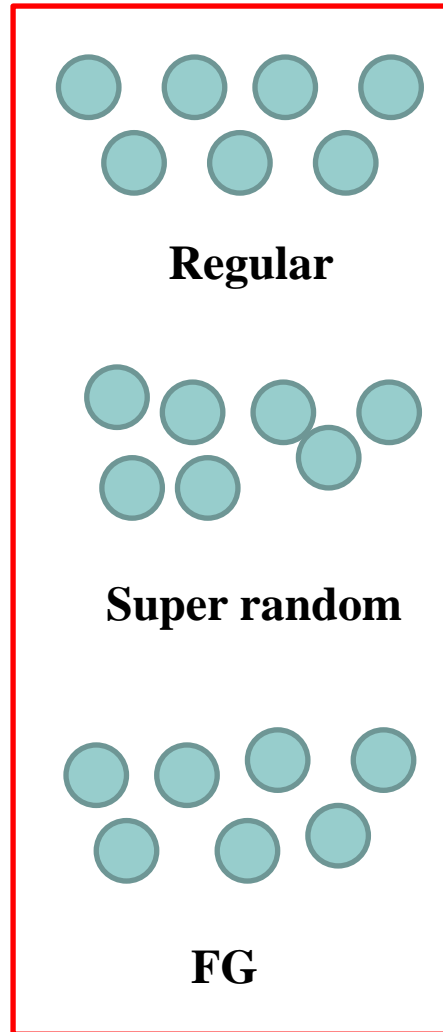
B: Fixed dots position, change dot size, It is typical for Printing

C: Miscellaneous, Analysis purpose.

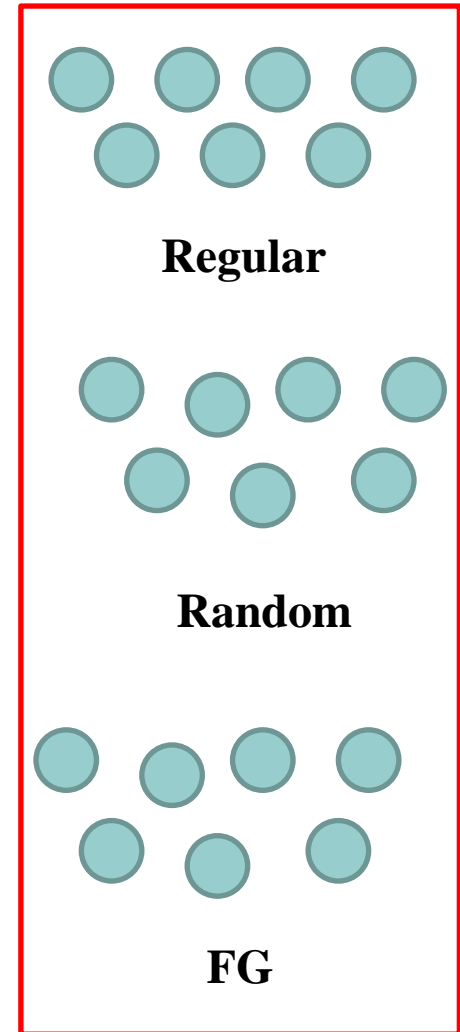
Inheritance of same size



FG 2

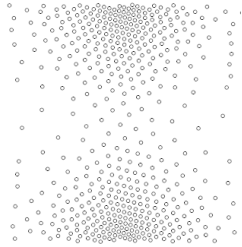


FG 3

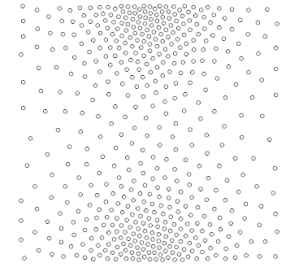
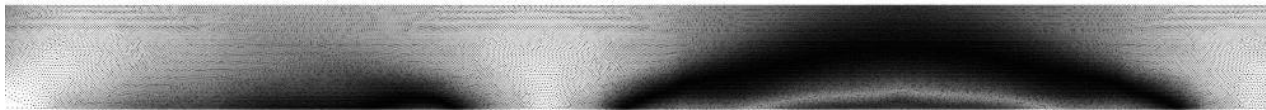


Regular+FG

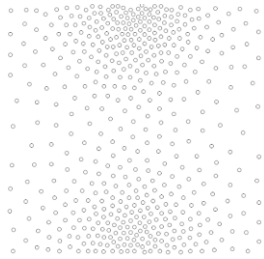
Output result comparison



Regular



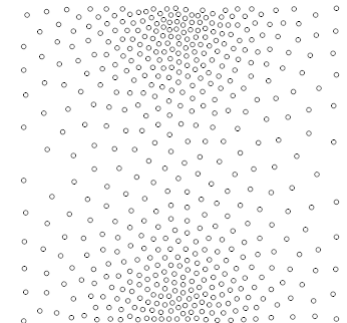
Regular+FG



FG2

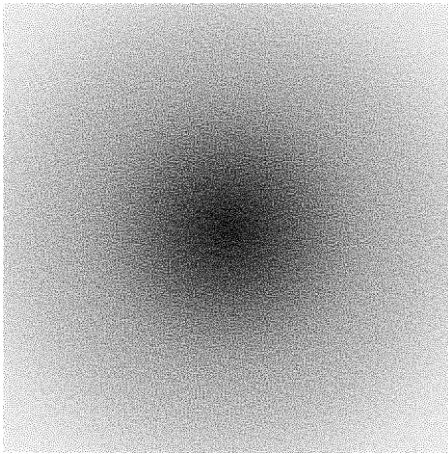


FG3



Output(Laser)

Fixed X,Y processing
Rasterization



Homogeneous
Same Size Output
(Enable fine grained processing)



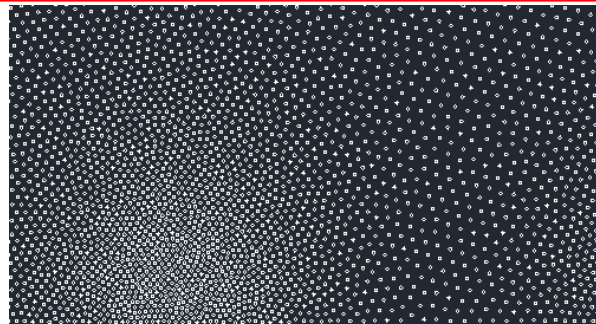
Laser
(Same Size)

sharp image
Fine Grained 3



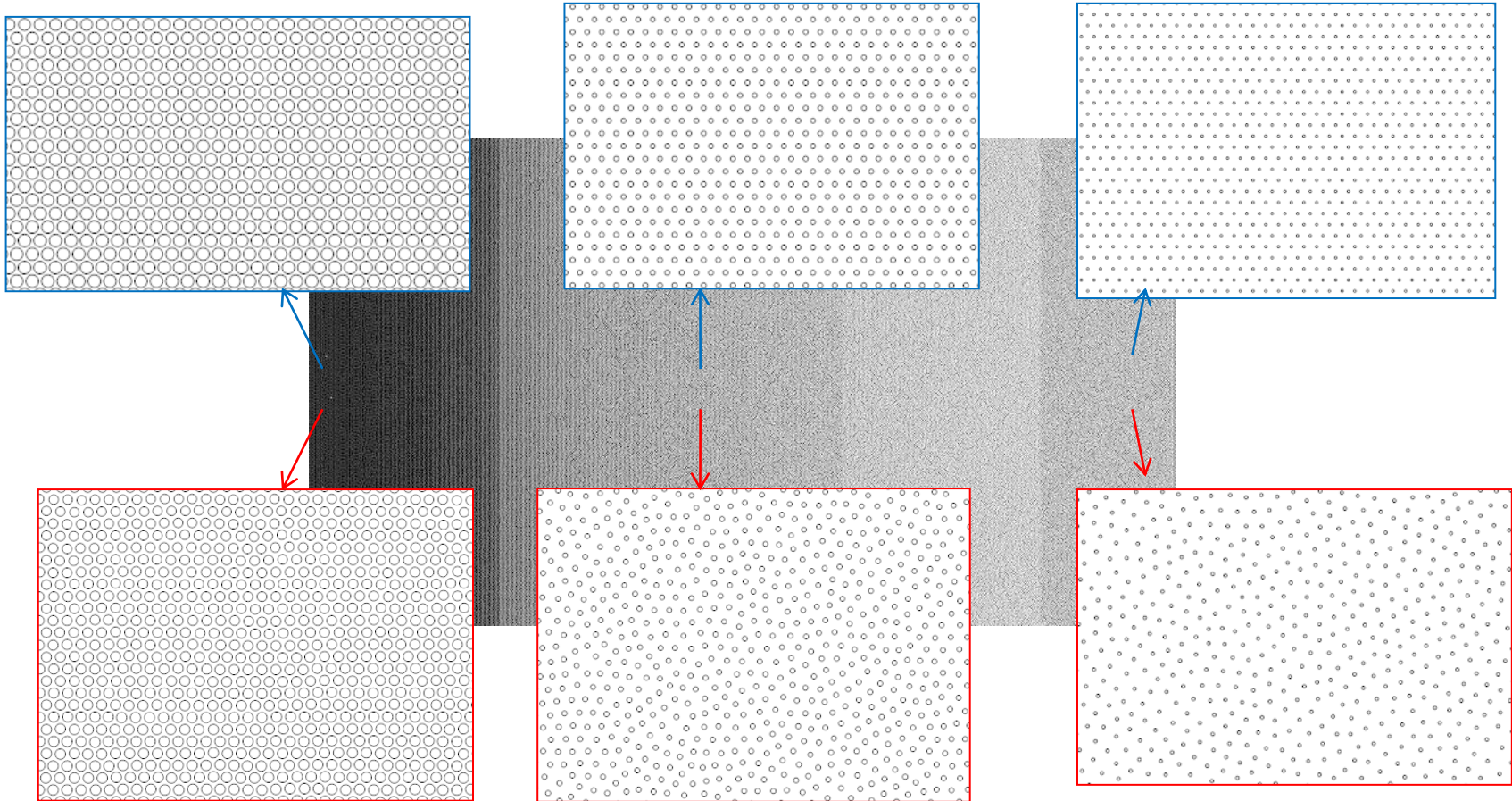
**light guide
or general purpose**

Fine Grained 2



Output(Printing)

Same Pitch(Fixed X , vary Y pitch)



Same Pitch -Fine Grained 3

Mask function over view

Layers

- New Design - (200,200)
- Background - (0,0)x(200,200)
- top - (0,0)x(200,200)
- button - (0,0)x(200,200)

Properties

Layout

Height	200
Width	200

Mask

Masks - Block	0 mask(s) applied
Masks - Image	0 mask(s) applied
Masks - Include/Exclude	0 mask(s) applied
Masks - Text	0 mask(s) applied
Process block mask	True
Process include mask	True

Select new design

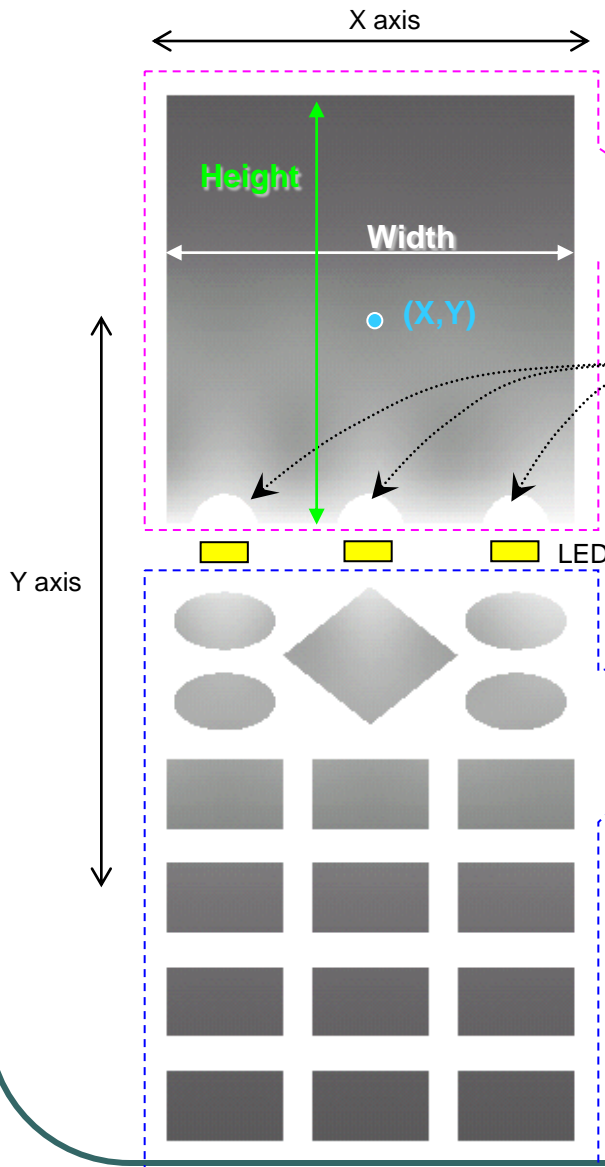
Image

Text

Block

Include/exclude

Mask function – Include/Exclude



Application of Include/ Exclude Mask function

Include / Exclude Mask Data Editor...

+ Add Row - Remove Row

Shape Type	Action	Center X	Center Y	Width	Height
Rectangle	Include	30	25	28	37
Ellipse	Exclude	20	45	5	8
Ellipse	Exclude	30	45	5	8
Ellipse	Exclude	40	45	5	8
Ellipse	Include	20	52	7	5
Ellipse	Include	20	59	7	5
Diamond	Include	30	55	12	12
Ellipse	Include	40	52	7	5
Ellipse	Include	40	59	7	5
Rectangle	Include	20	67	8	6
Rectangle	Include	30	67	8	6
Rectangle	Include	40	67	8	6
Rectangle	Include	20	76	8	6
Rectangle	Include	30	76	8	6
Rectangle	Include	40	76	8	6
Rectangle	Include	20	85	8	6
Rectangle	Include	30	85	8	6
Rectangle	Include	40	85	8	6
Rectangle	Include	20	94	8	6
Rectangle	Include	30	94	8	6
Rectangle	Include	40	94	8	6

Buttons: Validate, OK, Cancel

Mask function - Block

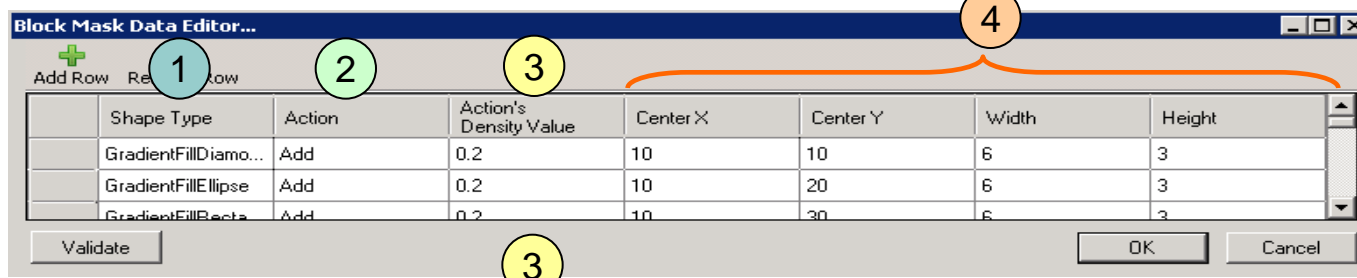
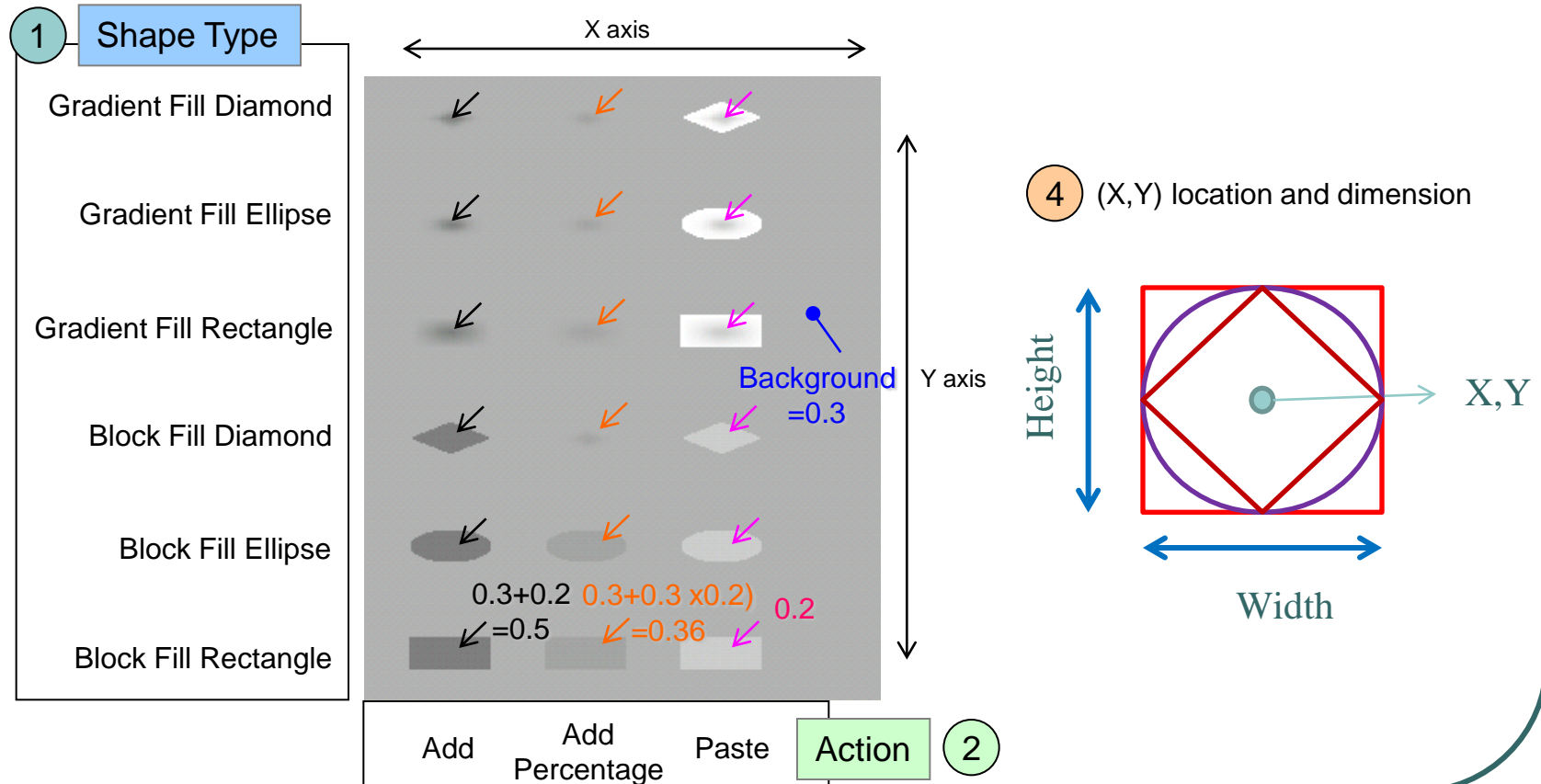


Fig. The result of applying **Action's density value= 0.2** to a density table with all dots' density are 0.3



Mask function - Image

Image Mask Data Editor...

1 Add Row 2 Remove Row

Action	Image	Trim White	Reverse Color	Multiplier	Adder	Image Info	Center X	Center Y	Width	Height
Add		True	True	1	0	Image info...	25	20	18	12
Add		False	True	1	0	Image info...	25	40	18	12

1 Action	Add	Multiple	Paste	5 (X,Y) location and dimension
	Value= 0.3+ IMG	Value= 0.3 xIMG	Value= IMG	

2 Image with gray color

Import

3 Trim White & Reverse color

Reverse color

Trim White

N/A

4 $New=M*OLD+A$

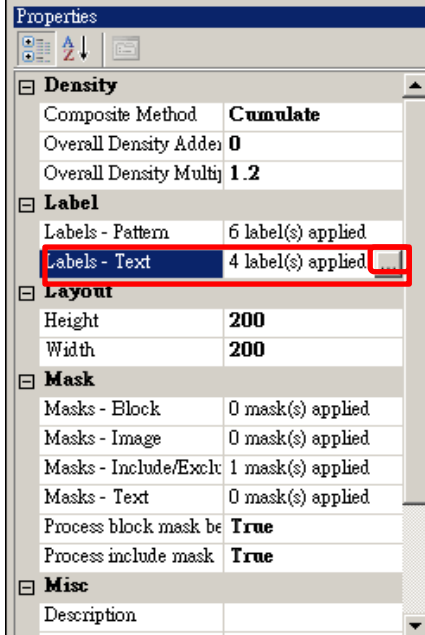
Multiplier=1 Adder=0.1

Multiplier=2 Adder=0.3

Multiplier=3 Adder=0.5

Labels-TXT

Click Here



Text Label Editor

Add Row Remove Row Toggle Combobox Visible

	Text	Left	Top	Char Size Method	Char or Shape Size (mm)	Shape Spacing (mm)	Char Resolution	Info
▶	This is char size	165	-3	ByCharSize	2	0	16	Info
	This is char size	165	0.5	ByCharSize	2	0	16	Info
	shape size	160	200	ByShapeSize	0.3	0	16	Info
	shape size	160	193	ByShapeSize	0.3	0	16	Info

• (Left, Top)



PS. The setting of char resolution will larger than output TXT for example set 16 output might be 12.

Labels-Pattern

Click Here

Properties

- Density**
 - Composite Method: **Cumulate**
 - Overall Density Added: **0**
 - Overall Density Multiplier: **1.2**
- Label**
 - Labels - Pattern: 6 label(s) applied
 - Labels - Text: 4 label(s) applied
- Layout**
 - Height: **200**
 - Width: **200**
- Mask**
 - Masks - Block: 0 mask(s) applied
 - Masks - Image: 0 mask(s) applied
 - Masks - Include/Exclude: 1 mask(s) applied
 - Masks - Text: 0 mask(s) applied
 - Process block mask behavior: **True**
 - Process include mask: **True**
- Misc**
 - Description:

Pattern Label Editor

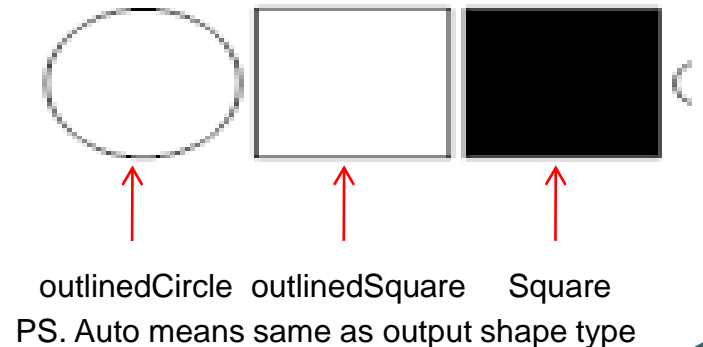
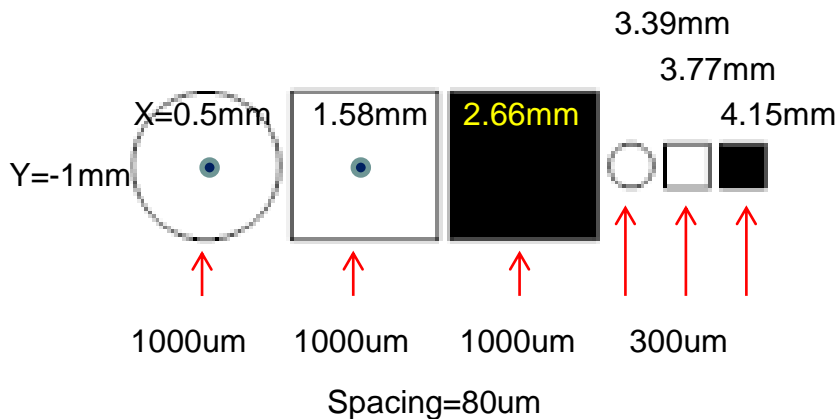
+ Add Row - Remove Row [icon] Toggle Combobox Visible

	X (Center)	Y (Center)	Shape Size (mm)	Shape Type	Comment
▶	0.5	-1	1	OutlinedCircle	
	1.58	-1	1	OutlinedSquare	
	2.66	-1	1	Square	
	3.39	-1	0.3	OutlinedCircle	
	3.77	-1	0.3	OutlinedSquare	
	4.15	-1	0.3	Square	

OK Cancel

Shape Type

- CircleAsPoint
- Auto
- OutlinedCircle
- OutlinedSquare
- CircleAsPoint
- Square



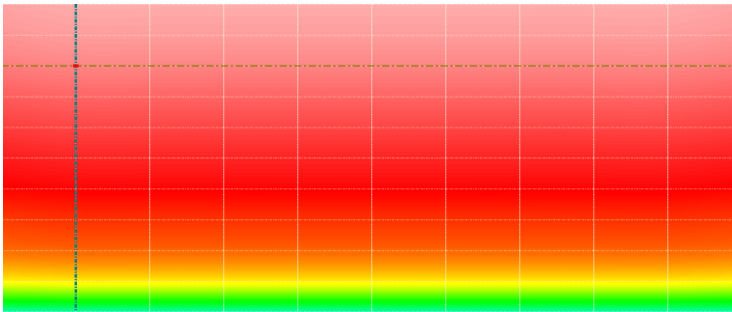
Mask in mask

Q: Why we need mask in mask function?

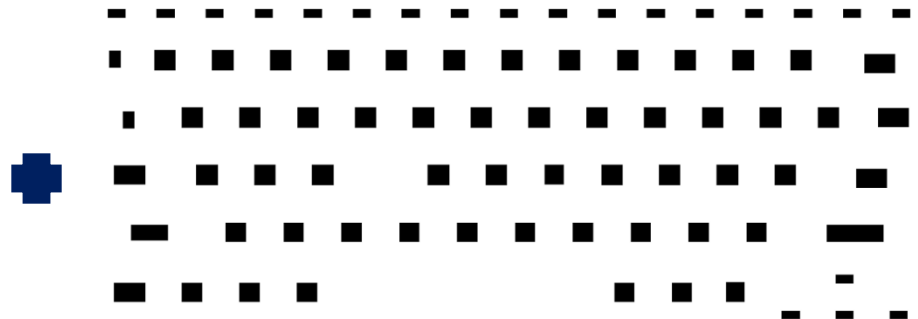
A: We need to design keypad or no rectangle shape design.

Q: Where to find this function?

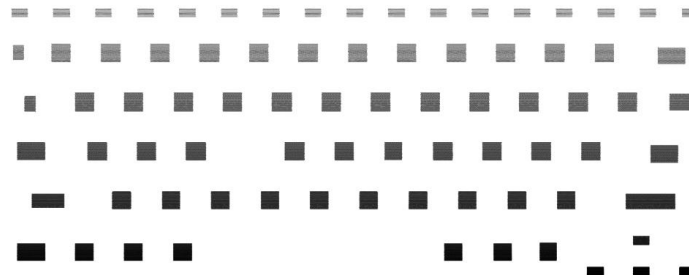
A: You can find this function is mask-image/block/**exclude**.



Design



Mask

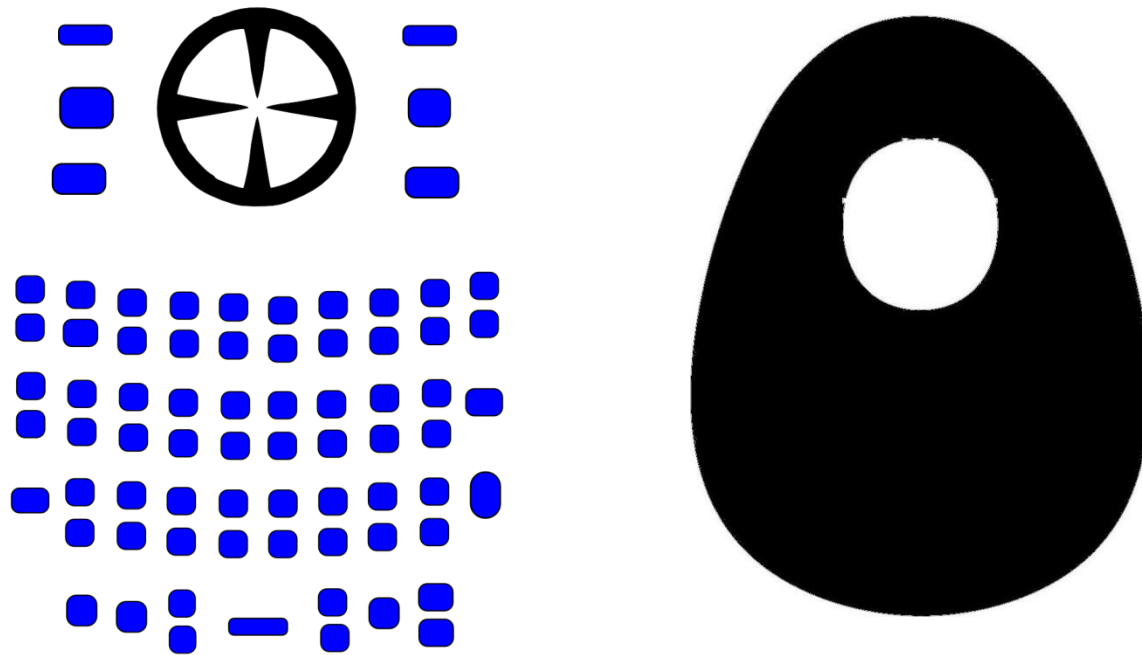


Final Output



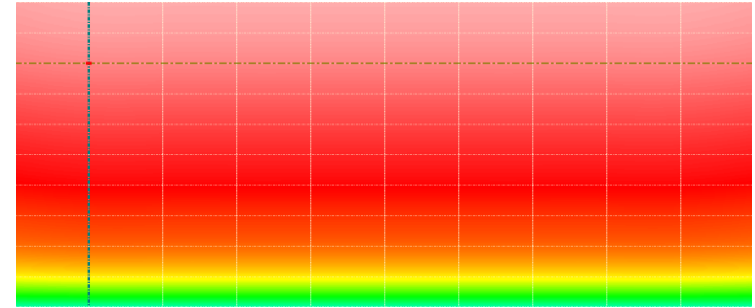
Procedure I

1. Prepare mask image and fill color in mask or unmask area.

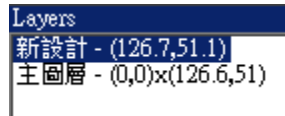


Procedure II

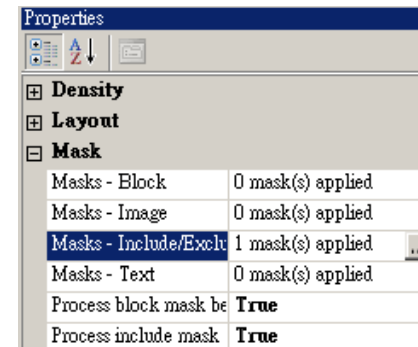
1 Design density profile by BacklightFly.



2 Click layers/new design.



3 Click Property/Mask Include/Exclude



4 Click Add Row.

Include / Exclude Mask Data Editor...

Shape Type	Action	Center X	Center Y	Width	Height	Comment	Mask in mask	Reverse mask in mask
Rectangle							<input checked="" type="checkbox"/>	False

Procedure III

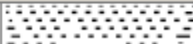
- 5 Select shape Type/Rectangle and Action/Exclude

	+	-	☰			
	Add Row	Remove Row	Toggle Combobox Visible			
	Shape Type	Action	Center X	Center Y	Width	Height
▶	<input type="text" value=""/>					
	Diamond Ellipse Rectangle	Exclude Include				

- 6 Key in mask dimension.

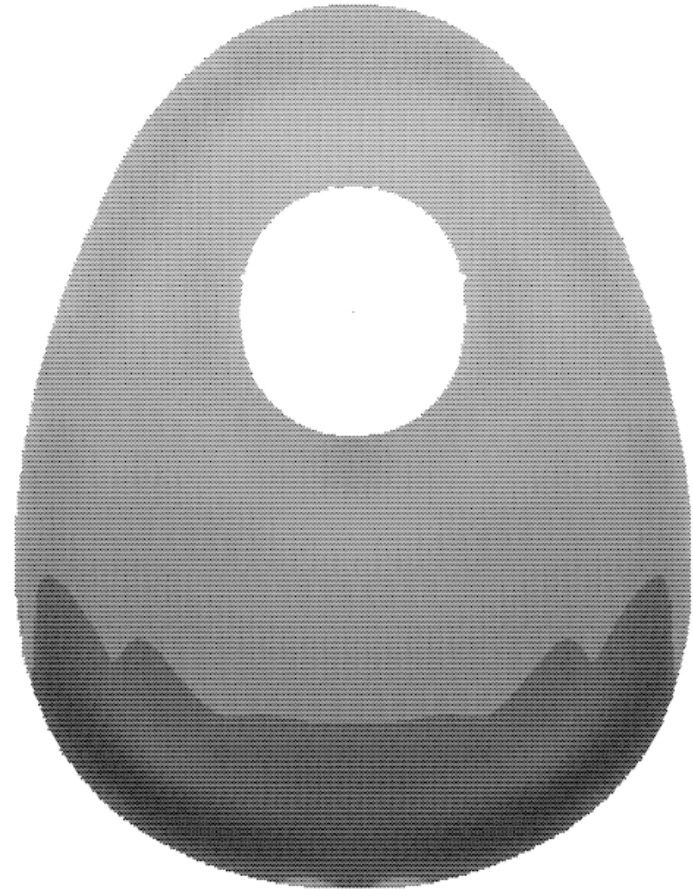
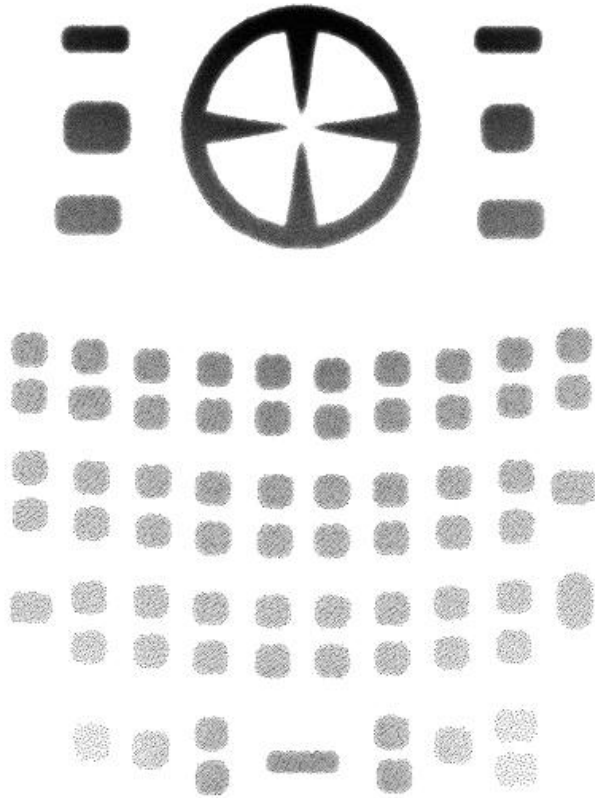
	Shape Type	Action	Center X	Center Y	Width	Height
▶	Rectangle	Exclude	63.35	25.55	126.8	51.2

- 7 Click Mask in mask column and select your keypad-image.

Mask in mask	Reverse mask in mask
	False

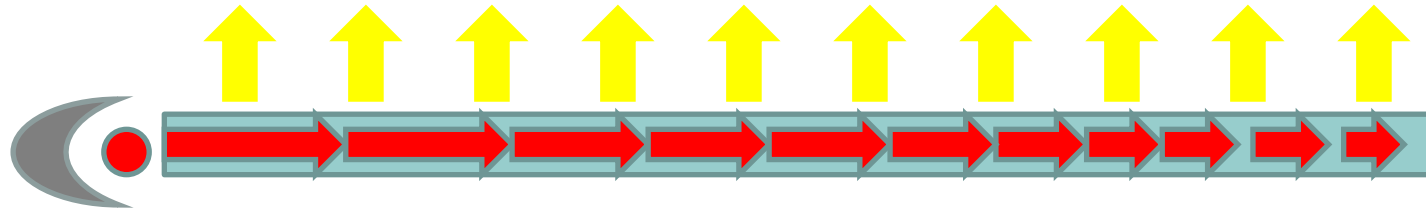
- 8 Set reverse mask in mask true or false to keep color or white.

Example



Concept 1,2,3 Density profile

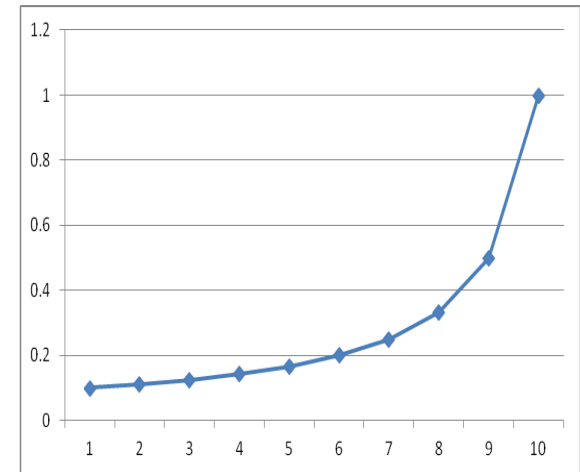
L=Each cell with 100Lux



E=Light source=1000Lux

Predict Density profile:

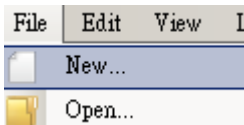
	1	2	3	4	5	6	7	8	9	10
E	1000	900	800	700	600	500	400	300	200	100
L	100	100	100	100	100	100	100	100	100	100
D=L/E	0.1	0.111111	0.125	0.142857	0.166667	0.2	0.25	0.333333	0.5	1



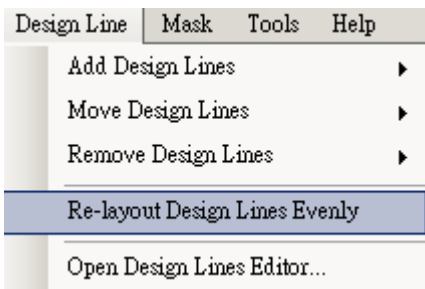
Design 1,2,3

You got 1st BacklightFly design

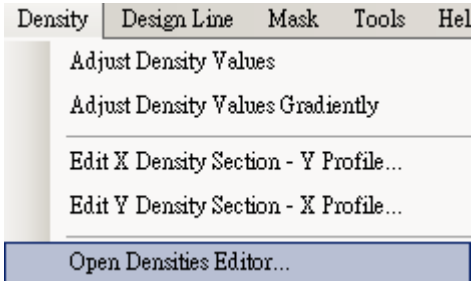
1. Open a new file



2. Re-layout 3X10



3. Open density editor

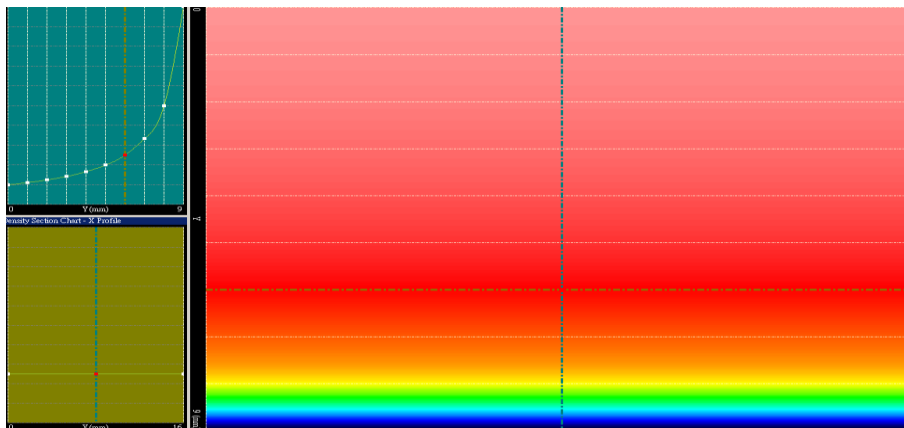


4. Paste Density

	0	8	16
0	0.1	0.1	0.1
1	0.11111...	0.11111...	0.11111...
2	0.125	0.125	0.125
3	0.14285...	0.14285...	0.14285...
4	0.16666...	0.16666...	0.16666...
5	0.2	0.2	0.2
6	0.25	0.25	0.25
7	0.33333...	0.33333...	0.33333...
8	0.5	0.5	0.5
9	1	1	1

Selection: (1, 1) - 1 x 1 Total Columns: 4, Rows: 11

5. You finish the 1st version



Modify

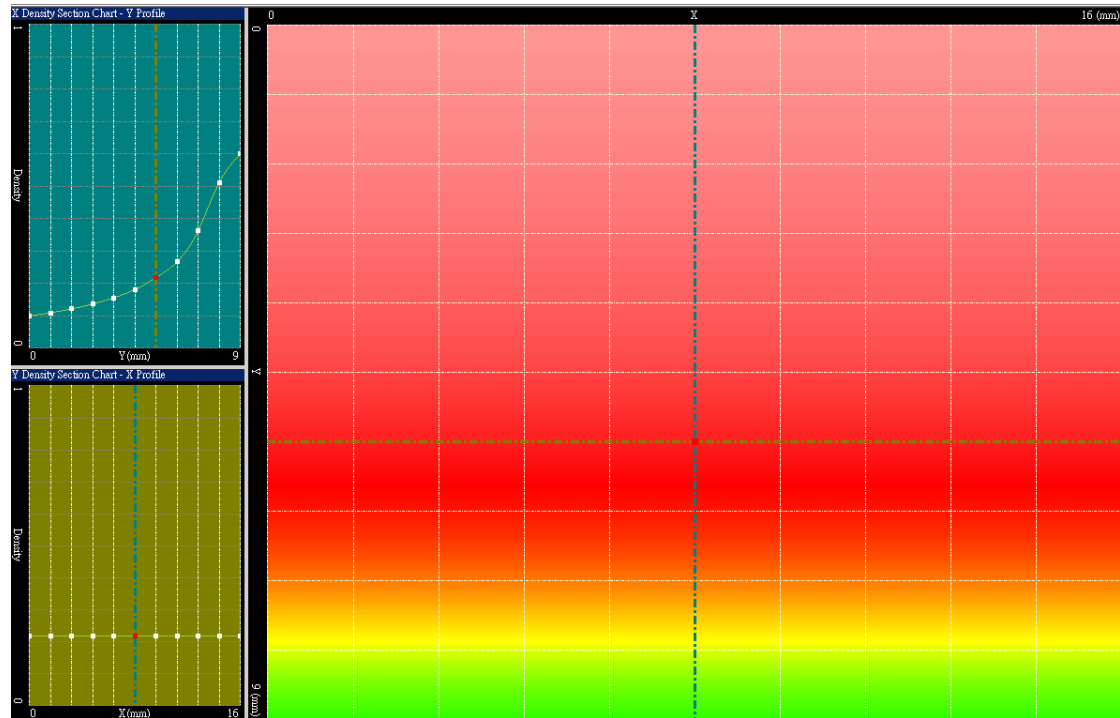
You finished 1st BacklightFly design

1. Change maximum density from 1 to 0.6(3D)~0.85(2D)
Because last cell with light reflect effect.

2. Re-layout 11X11

3. Export layer:*.slf

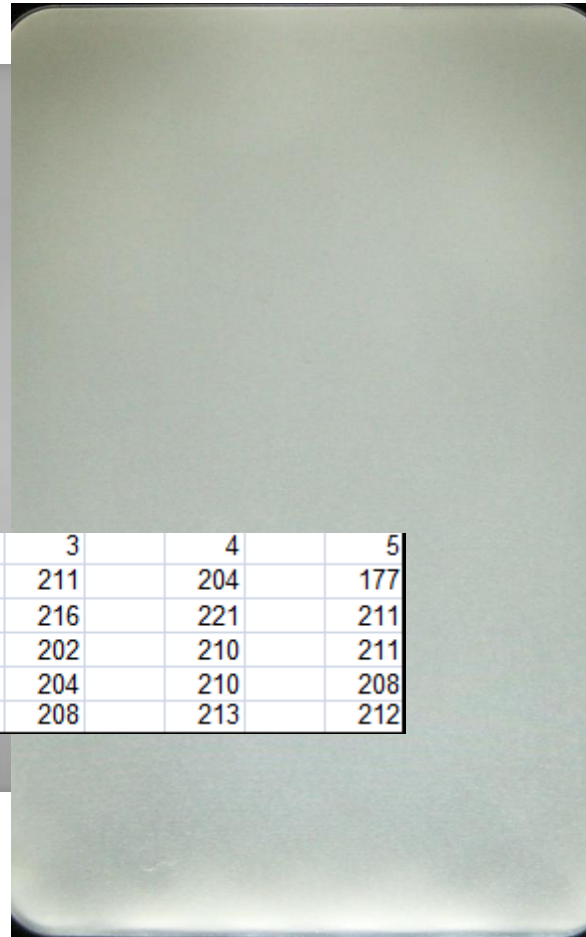
4. Output dots



Collect response

You should have CCD image and Data

4695		4569		4245
	4786		4603	
4207		4902		4091
	4852		4705	
4207		5080		4006



	1	2	3	4	5
1	158	184	211	204	177
2	190	204	216	221	211
3	184	193	202	210	211
4	187	194	204	210	208
5	173	187	208	213	212

Feedback 1,2,3

1. Click  in preview mode



2. Select pre saved *.SLF file(mesh data)

3. Copy measurement data then paste below red area

Density and Run to Run

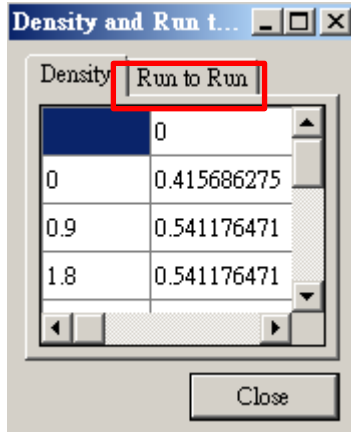
Density	Run to Run									
	0	0.05168	0.114729	0.307321	0.499914	0.692506	0.885099	0.948148	1	
0	0.019608	0.372549	0.607843	0.670588	0.745098	0.698039	0.666667	0.686275	0.019608	
0.034014	0.47451	0.54902	0.556863	0.639216	0.701961	0.682353	0.611765	0.603922	0.615686	
0.112472	0.619608	0.580392	0.607843	0.690196	0.733333	0.698039	0.654902	0.631373	0.619608	
0.306236	0.698039	0.666667	0.690196	0.721569	0.741176	0.745098	0.733333	0.709804	0.682353	
0.5	0.74902	0.686275	0.705882	0.721569	0.745098	0.752941	0.745098	0.729412	0.709804	
0.693764	0.788235	0.717647	0.717647	0.74902	0.768627	0.756863	0.756863	0.756863	0.733333	
0.887528	0.847059	0.737255	0.705882	0.733333	0.776471	0.768627	0.741176	0.733333	0.756863	
0.965986	0.776471	0.8	0.74902	0.854902	0.866667	0.870588	0.788235	0.807843	0.886275	
1	0.027451	0.654902	0.827451	0.937255	0.94902	0.964706	0.870588	0.898039	0.062745	

Average 0.729645

Average Close

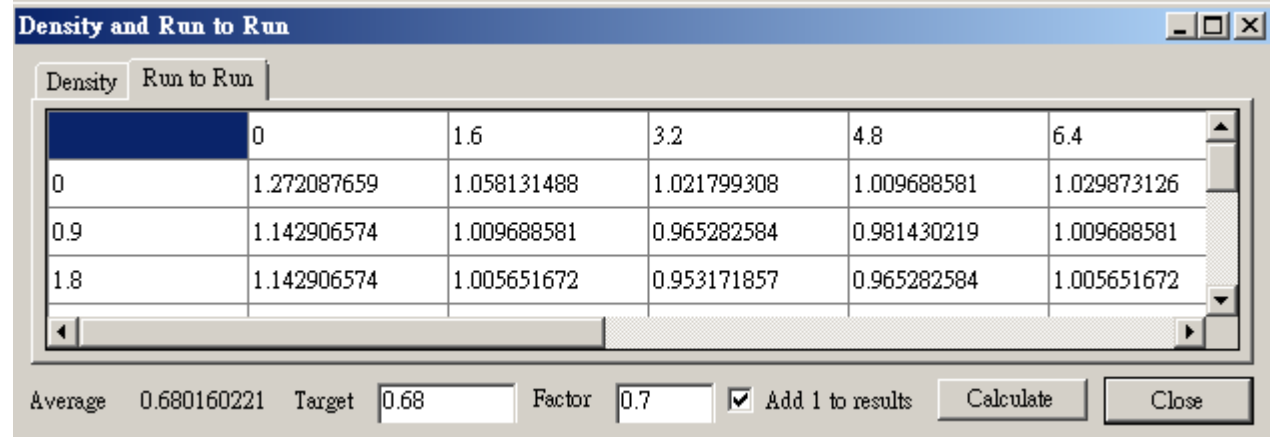
Feedback 1,2,3

4. You got luminance like data



4. Click Run to Run:

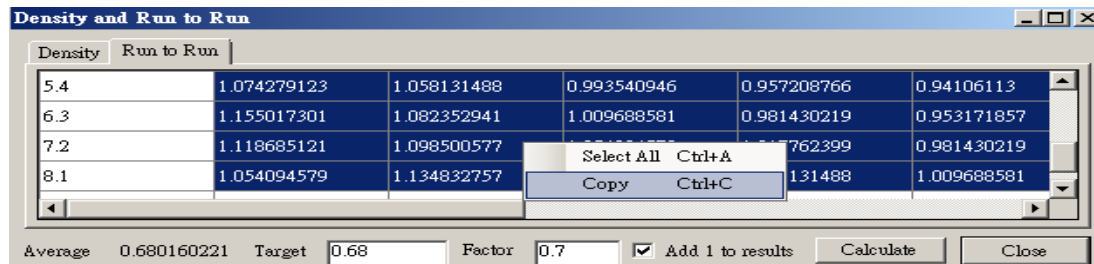
Formula: $\text{Factor} * (\text{target} - \text{data}) / \text{Target} (+1)$



6. You got ideal multiple factor:

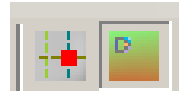
Need to increase or decrease percentage.

7. Copy

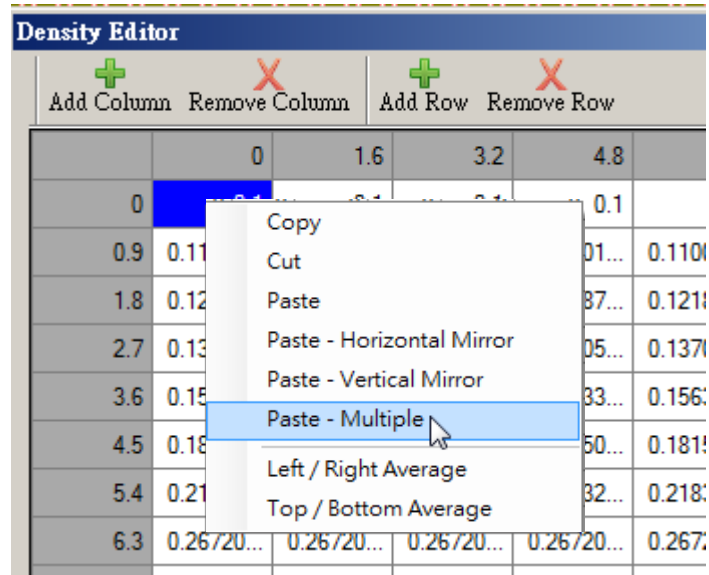


Feedback 1,2,3

9. Open density Editor in design mode



10. Paste multiple in right area



11. Paste multiple in right area/finished