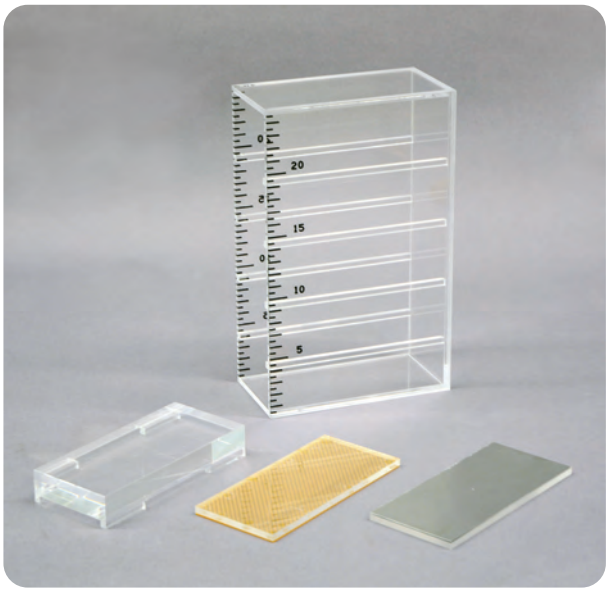
Caution:

Don't mark on the phantom with pen or leave printed materials contacted on its surface.
Ink marks on the phantom will be irremovable.

PH-56

Tomosynthesis Phantom NS

Instruction manual



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Before use

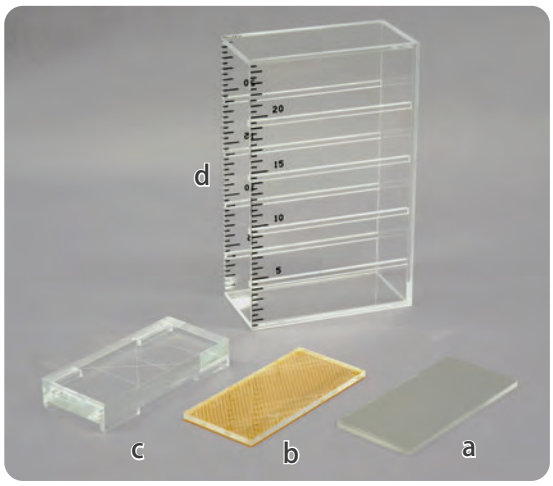
Features

This phantom allows evaluation of reconstruction slices and uniformity in the measurement of slice thickness through showing the images numerically and graphically.

- Evaluation items
  - Slick thickness measurement
  - Uniformity measurement
  - Reconstruction interval measurement

Set includes

Before use, be sure that following parts are included



● Parts

a	Slice thickness unit	Qty: 1
b	Uniformity unit	Qty: 1
c	Reconstruction interval unit	Qty: 1
d	Height setting rack	Qty: 1

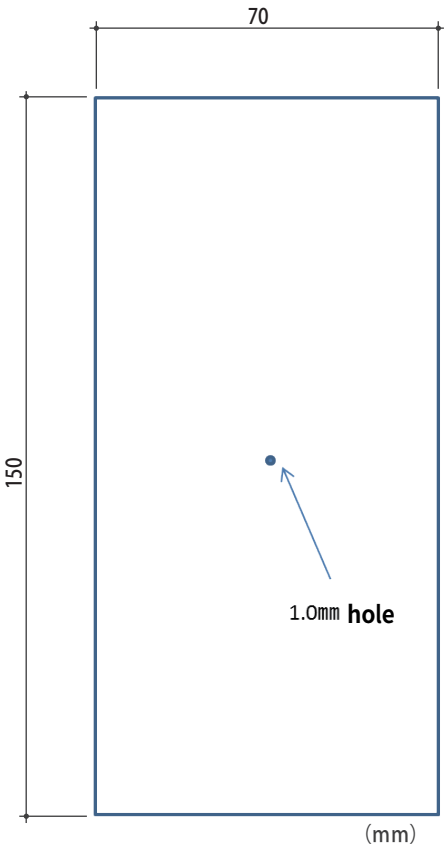
⚠ Cautions

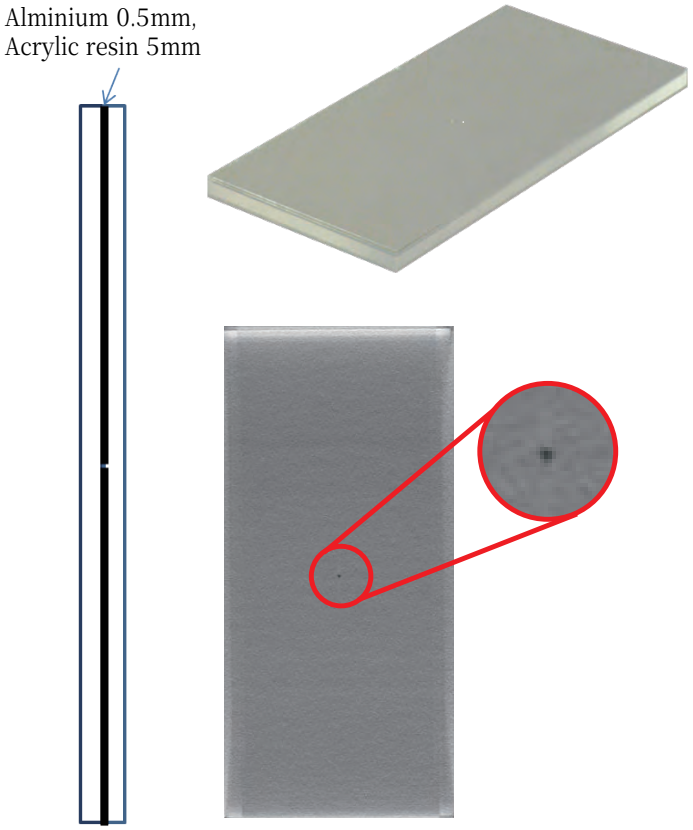
- Handle with care
  As acrylic resin are used, fall or strong shock may damage the phantom.
- This may be cleaned with wet cloth. If necessary, use diluted detergent. Never use organic solvent like thinner.
- Store phantom at room temperature, away from shock, heat, moisture, and direct sunlight.
- Don't mark on the models with pen or leave any printed materials in contact with their surface. Ink marks on the phantom are not removable.

Phantom parts

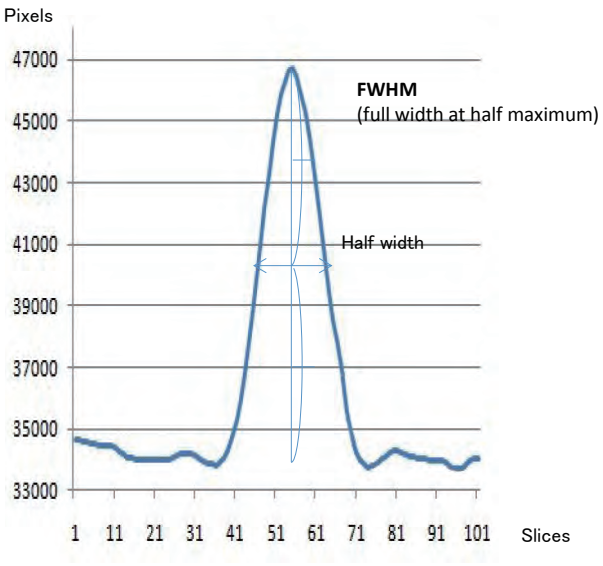
a. Slice thickness

Material：Aluminium、Acrylic resin





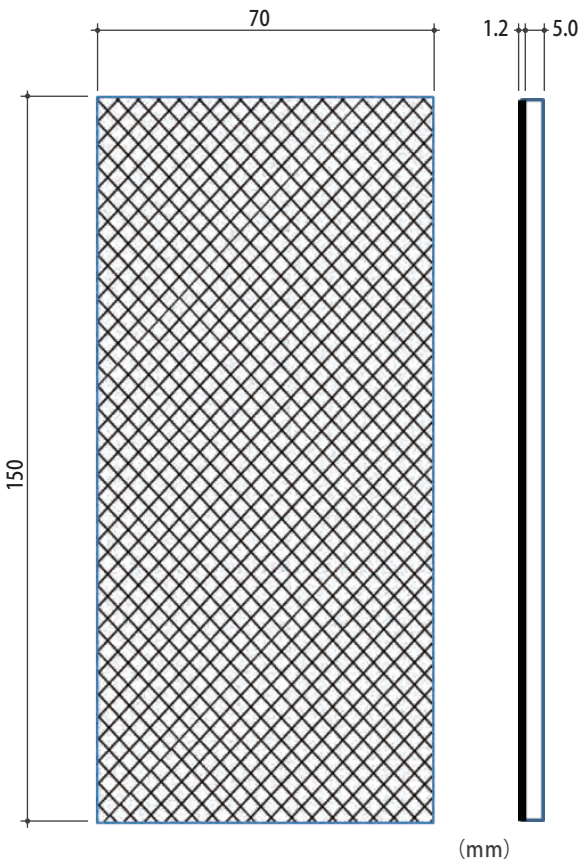
Slick thickness can be obtained by FWHM at the hole.

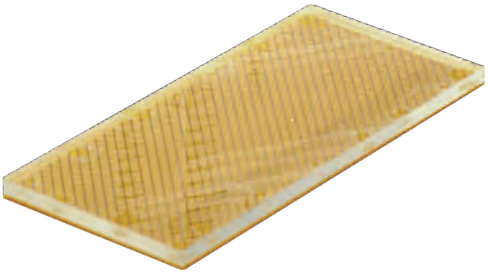


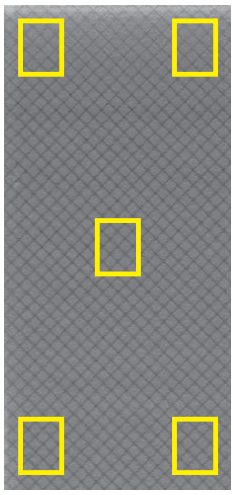
Phantom parts

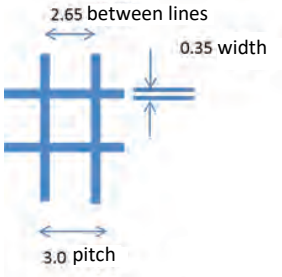
b . Uniformity unit

Material : Copper, bakelite, and acrylic resin







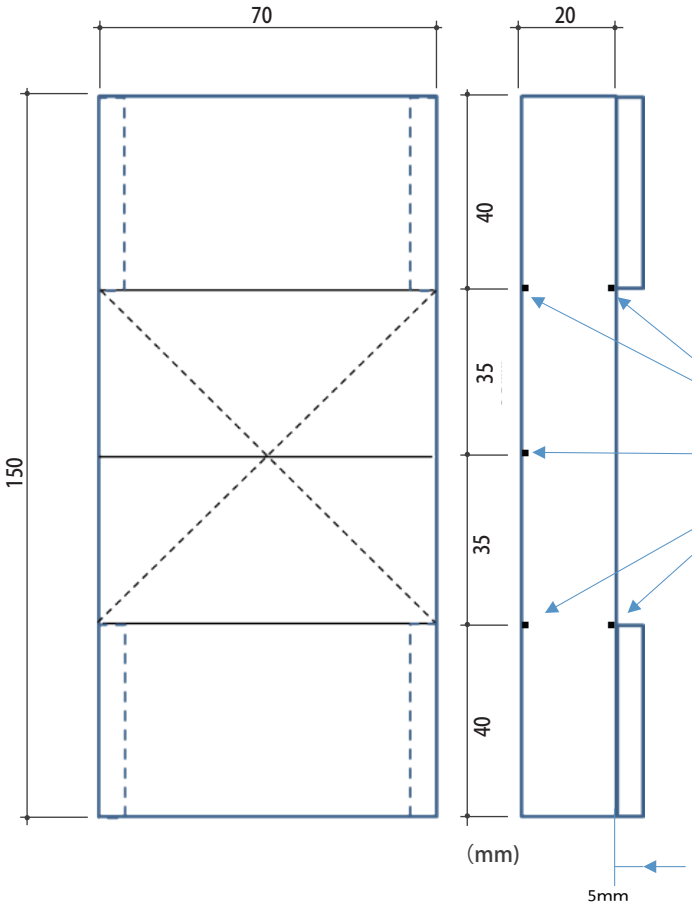


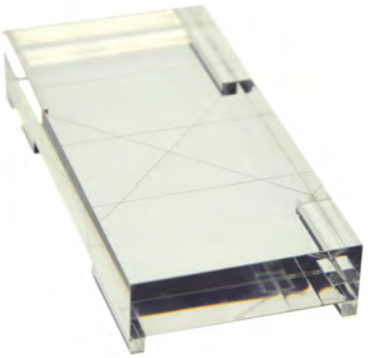
Set ROI to 5 measurement points. The surface whose difference of pixels between maximum and minimum are larger are defined as "in focus". Then check the uniformity and tilt of X-ray fluoroscopic table.

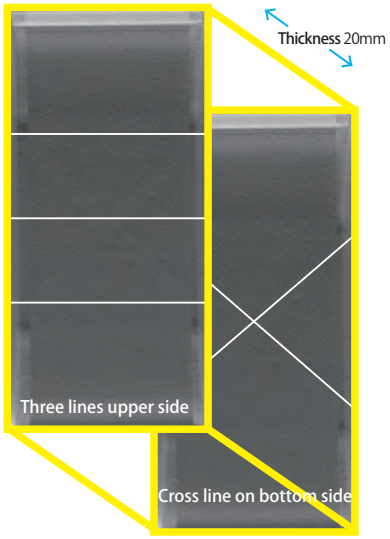
Phantom parts

c . Reconstruction interval unit

Material：0.1 ㎜ Stainless line、Acrylic resin





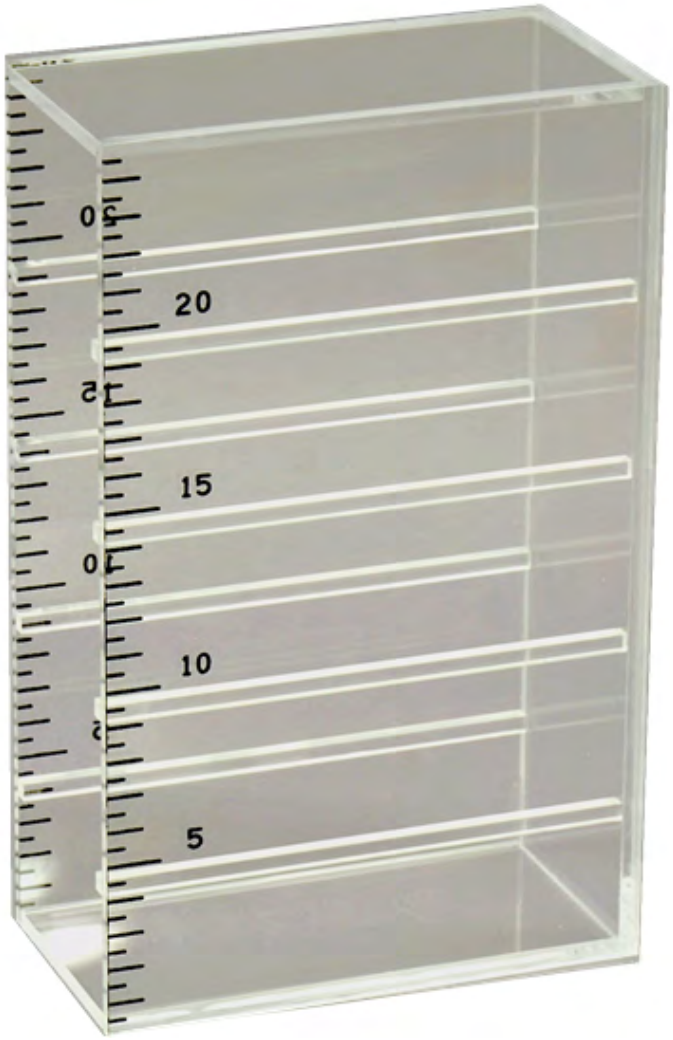


The surface whose differences of maximum and minimum lengths between three metal lines on the upper side and cross lines on the bottom side are defined as "in focus". Then check the reconstruction interval from the height.

Phantom parts

d . Height setting rack

Material: acrylic resin



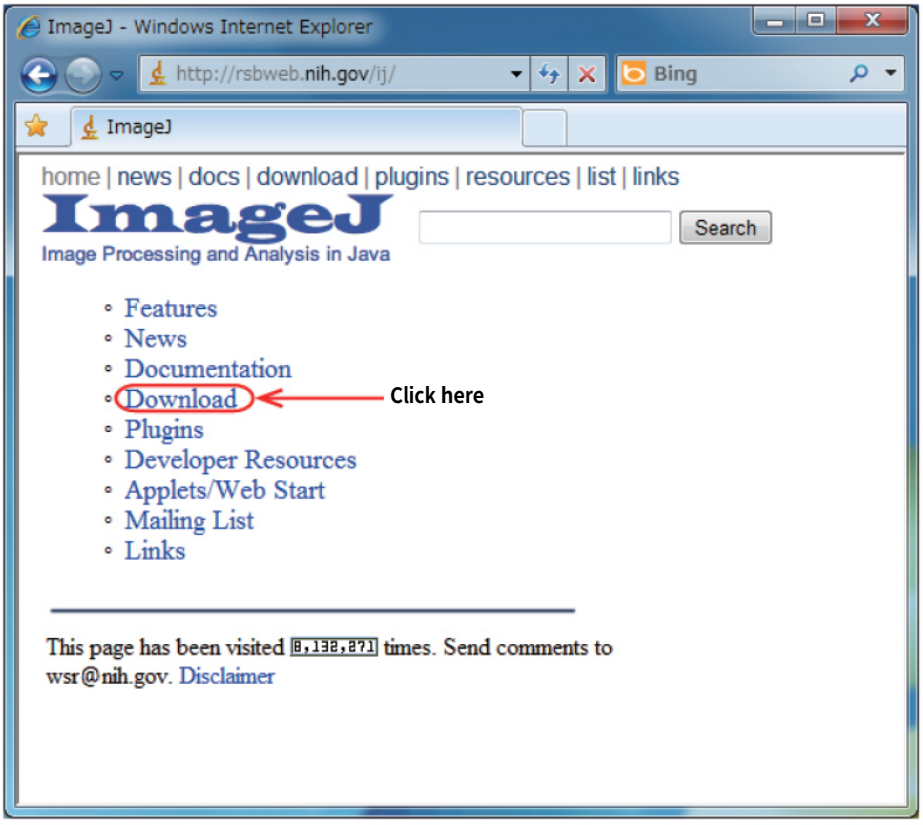
Test units can be set in the aluminum supporting box at 50, 100, 150, 200 (normally 100mm). Scales are shown so that the height from the floor can be shown.

1 Download of free software

Download of free software "ImageJ"

Download the software "ImageJ" from the website below. Import DICOM data to your PC and analyze.

http://itshiatsu.blogspot.jp/2012/02/01-imagej.html



2 Slice thickness

Insert slice thickness unit to height setting rack and put is vertically long.

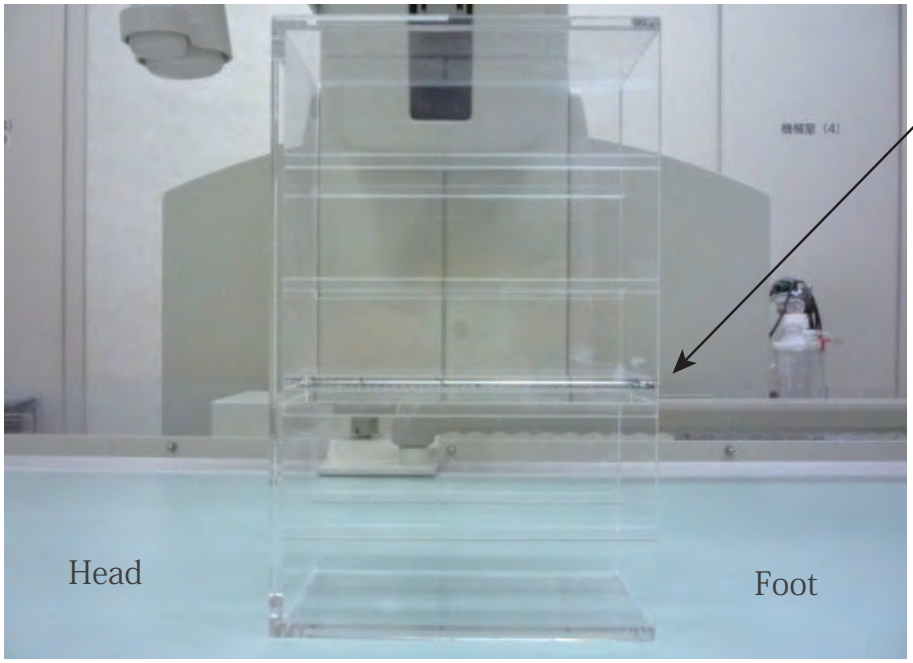


Image acquisition condition : Angle **40°** , **Slow** , **HAND F**

Set with low condition first

Aluminum plate with hole(ϕ 1 mm)

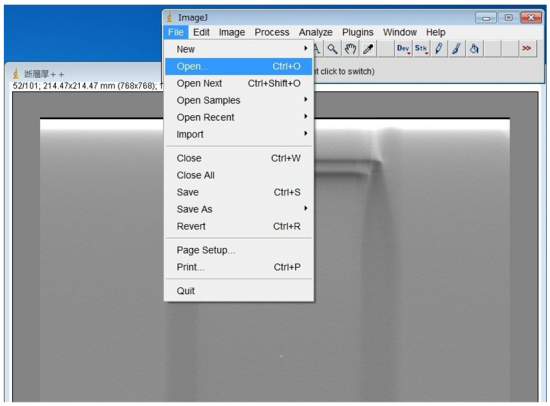
Image acquition data Thickness (+−) **0.5mm** interval

2 Slice thickness

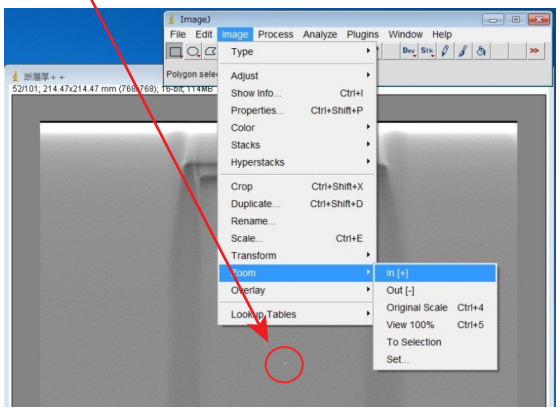
The data used in this manual are images without image procession.

One example using free software

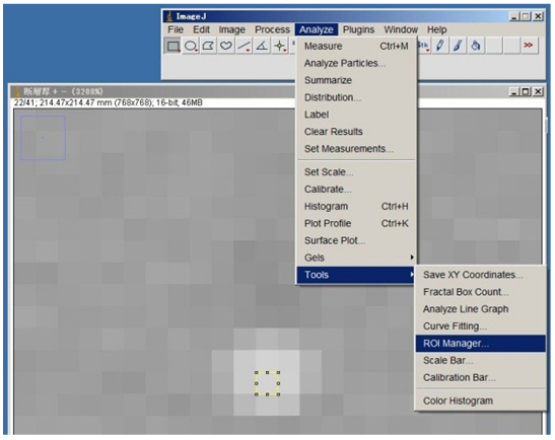
① Download image data
[File]→[Open]



② Enlarge hole hole part.
[Image]→[Zoom]→[in] (until **3200%**)

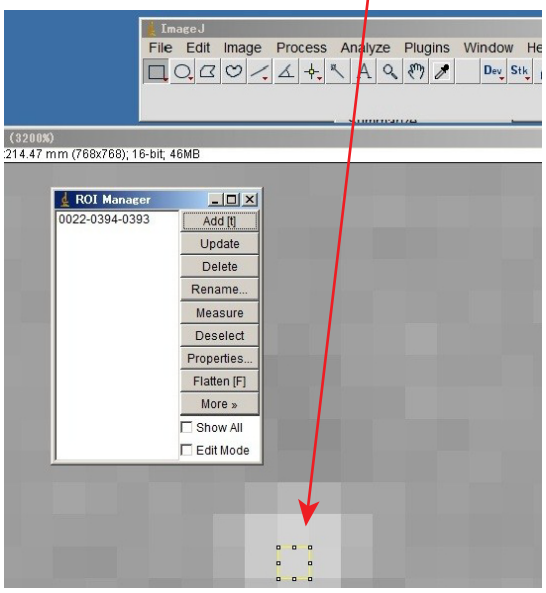


③ Cover **1 Pixel** (white part)
[Analyze]→[Tools]→[ROI Manager]



④ Register all the reconstructed image to ROI address.

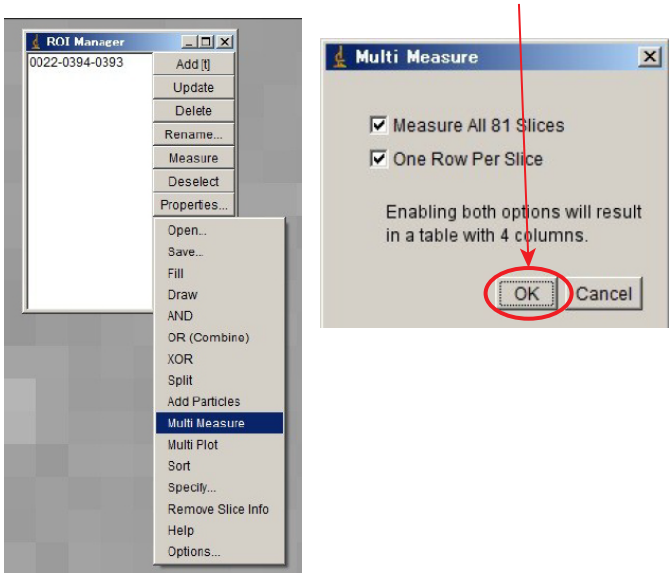
[ROI Manager]→[Add]



2 Slice thickness

⑤ Register all the reconstructed image to ROI address.

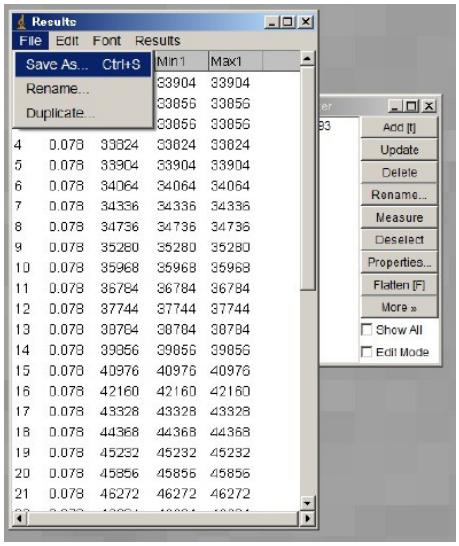
[Add]→[More]→[Multi Measure]→[ok]



⑥ Save the result

[File]→[Save As]→File name

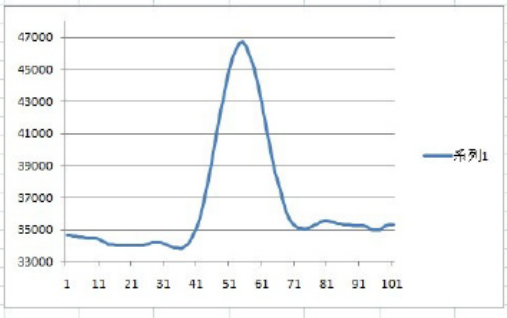
【Slice thickness(filter number)】



⑦ Calculate slice thickness

- 1 measurement＝0.5mm
- **(max+min)/2**＝central point

	A	B	C	D	E	F	G	H	I
1		Area1	Mean1	Min1	Max1		max	min	max+min/2
2	1	0.078	34656	34656	34656		46704	33824	40264
3	2	0.078	34640	34640	34640				
4	3	0.078	34608	34608	34608				
5									
6	41	0.078	35280	35280	35280				
7	42	0.078	35968	35968	35968				
8	43	0.078	36784	36784	36784				
9	44	0.078	37744	37744	37744				
10	45	0.078	38784	38784	38784				
11	46	0.078	39856	39856	39856				
12	47	0.078	40976	40976	40976				
13	48	0.078	42160	42160	42160				
14	49	0.078	43328	43328	43328				
15	50	0.078	44368	44368	44368				
16	51	0.078	45232	45232	45232				
17	52	0.078	45856	45856	45856				
18	53	0.078	46272	46272	46272				
19	54	0.078	46624	46624	46624				
20	55	0.078	46704	46704	46704				
21	56	0.078	46448	46448	46448				
22	57	0.078	45952	45952	45952				
23	58	0.078	45280	45280	45280				
24	59	0.078	44480	44480	44480				
25	60	0.078	43584	43584	43584				
26	61	0.078	42576	42576	42576				
27	62	0.078	41552	41552	41552				
28	63	0.078	40496	40496	40496				
29	64	0.078	39488	39488	39488				
30	65	0.078	38560	38560	38560				



17列

断層厚＝17列×0.5mm＝8.5mm

3 Uniformity

Insert slice thickness unit to height setting rack and put is vertically long.

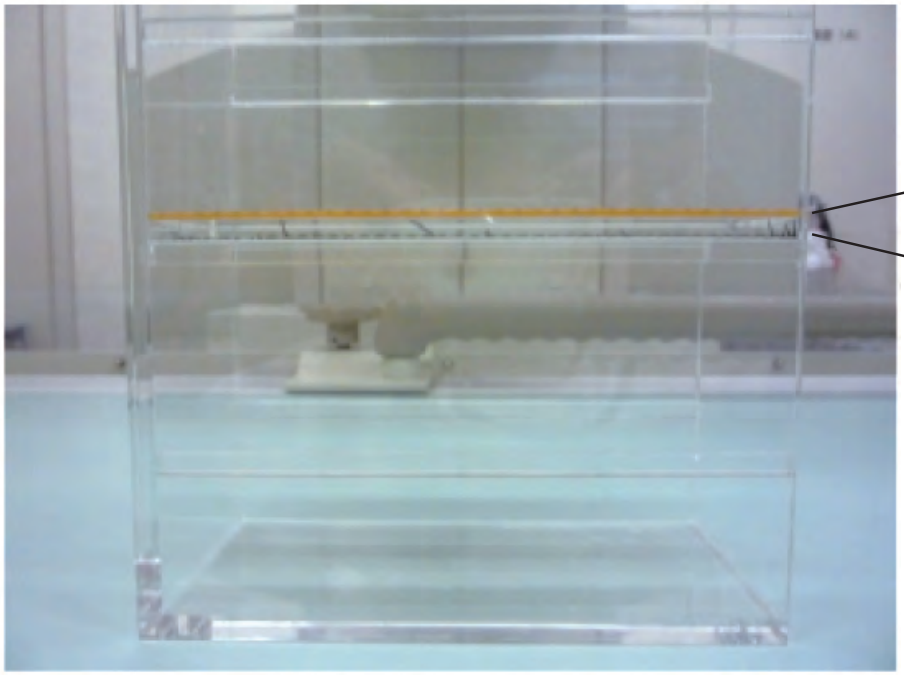


Image acquisition condition：Angle 40° , Slow , HAND F

Unify condition as below. Three images can be analyzed.

1.Thickness (++)
2.Thickness (+−)
3.Thickness (−−)

This image is a sample

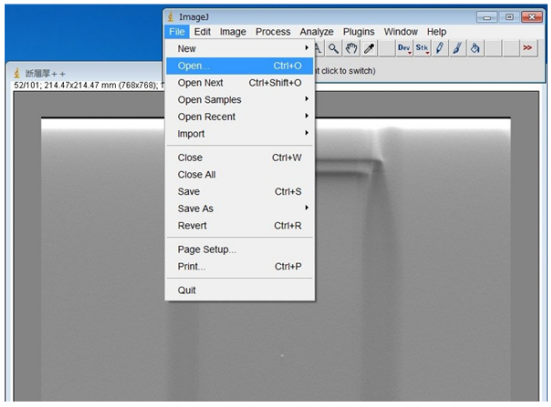
3 Uniformity

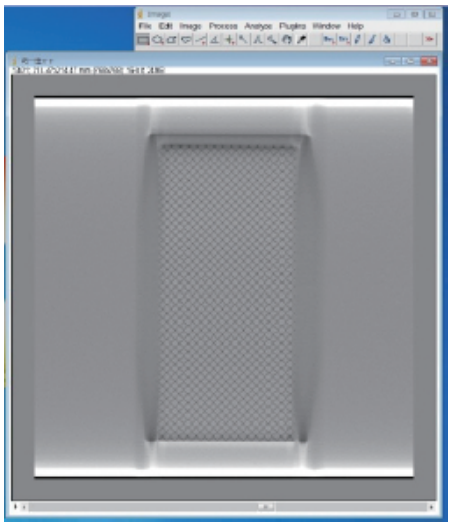
The data used in this manual are images without image procession.

One example using free software

① Open image data

[File]→[Open]



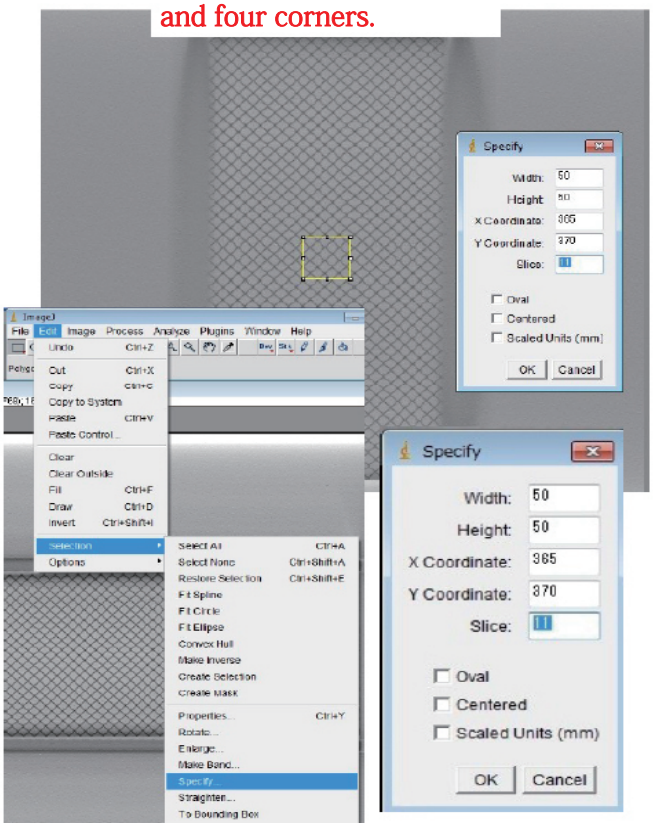


② Among 21 image reconstruction data, choose one data visually in focus

[Edit]→[Selection]→[Specify]→In put value on right bottom.

※**Width、Height** shall be set at **50 ! X、Y** can be set at the center of coordinate point.

Set same ROI at the center and four corners.



One example using free software

3 Uniformity

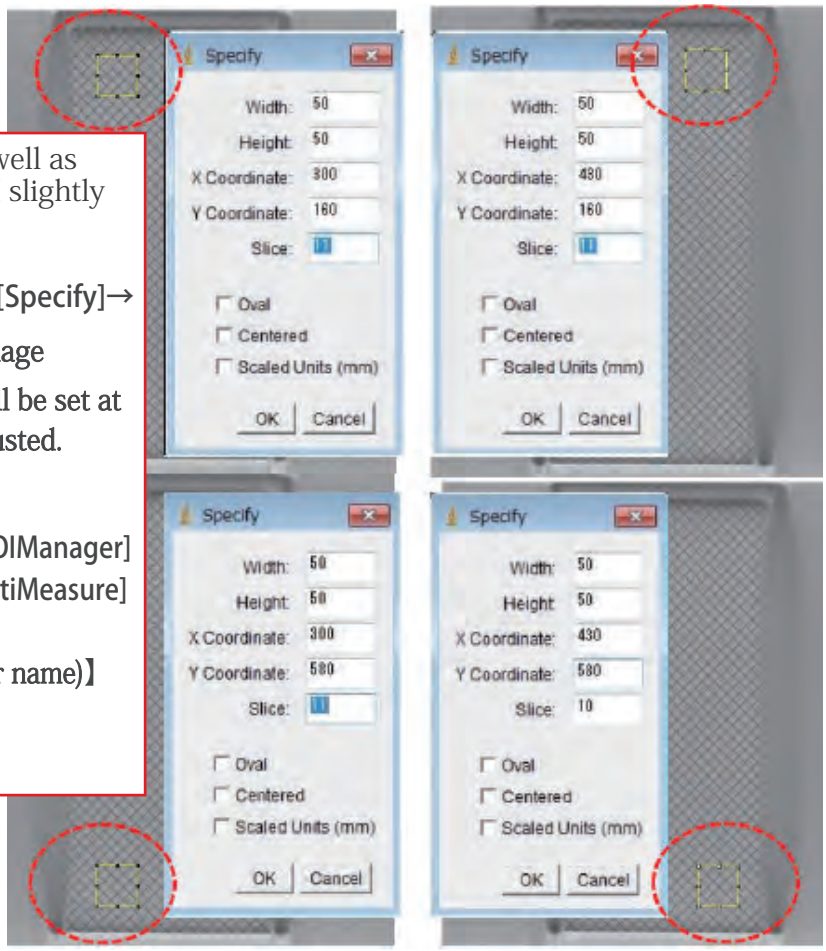
③ Measure center as well as four corners. Take ROI slightly inside the grid plate

[Edit]→[Selection]→[Specify]→

Input data in the image

※Width、Height shall be set at 50！X、Y can be adjusted.

[Analyze]→[Tools]→[ROIManager]→[Add]→[More]→[MultiMeasure]→[ok]→[Save As]→File name【Uniformity(filter name)】



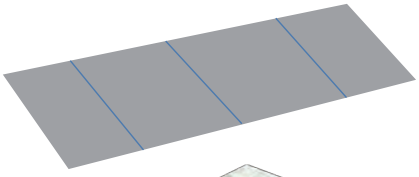
One example using free software

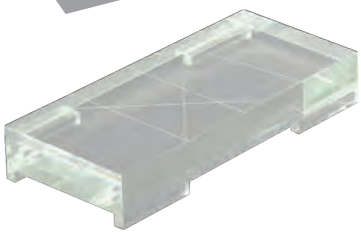
4 Reconstruction interval

Set reconstruction interval unit to 95mm high

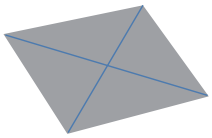
Upper side

Height in focus **120mm**





Bottom side



Height in focus **100mm**

Image acquisition condition :
Angle **40°** , **Slow** , **HAND F**

Image to be analyzed

Thickness (+−)
0.5mm interval

Height in focus
100mm

This image is a sample

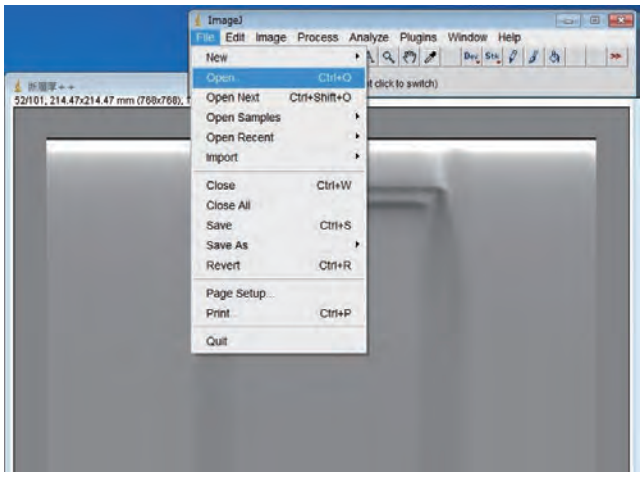
4 Reconstruction interval

The data used in this manual are images without image procession.

One example using free software

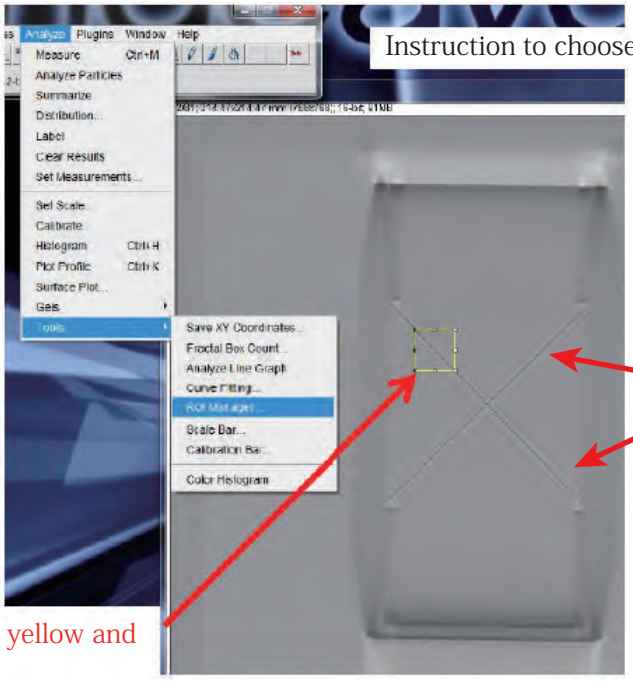
① Open image data

[File]→[Open]



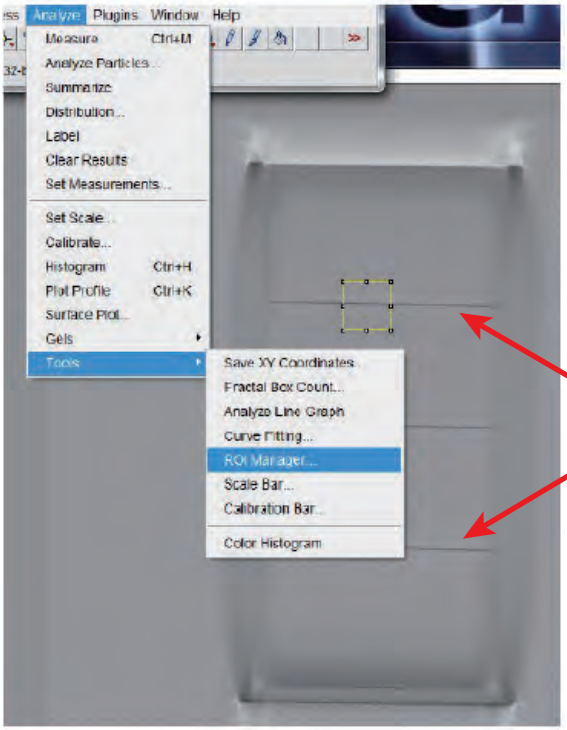
② Choose one image which is visually in focus

[Analyze]→[Tools]→[ROI Manager]



4 Reconstruction interval

④ Choose one image which is visually in focus
[Analyze]→[Tools]→[ROI Manager]

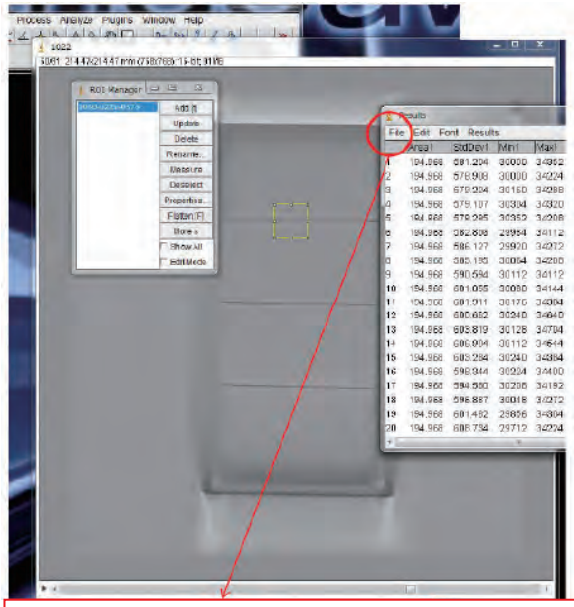


Instruction to choose the bottom side

Cover ROI in yellow and start.

Choose either one

⑤ **[Add]→[More]→[Multi Measure]→[ok]**



Instruction to choose the upper side

[File]→[Save As]→Save

4 Reconstruction Interval

⑤ bottom side

Result

⑥ upper side

Height from the floor **100mm** (Theoretically visual in focus)

height from the floor

The surface with maximum Max-min value are defined as "in focus". Then check the difference between the actual height and calculated height.

	A	B	C	D
1	Min1	Max1	Max-min	Height from the floor
2	30512	34624	4112	90
3	30512	34768	4256	90.5
4	30352	34864	4512	91
5	30256	34768	4512	91.5
6	30288	34688	4400	92
7	30352	34736	4384	92.5
8	30448	34688	4240	93
9	30544	34736	4192	93.5
10	30560	34688	4128	94
11	29920	34560	4640	94.5
12	29200	34528	5328	95
13	28416	34448	6032	95.5
14	27552	34560	7008	96
15	26368	34800	8432	96.5
16	25120	34864	9744	97
17	24048	34928	10880	97.5
18	23264	35264	12000	98
19	22320	35536	13216	98.5
20	21472	35776	14304	99
21	20912	35920	15008	99.5
22	20784	35920	15136	100
23	21040	35840	14800	100.5
24	21104	35728	14624	101
25	21248	35568	14320	101.5
26	21840	35344	13504	102

3	29360	34656	5296	110.5
		48	4768	111
		56	4800	111.5
		24	4816	112
		08	4640	112.5
		80	4560	113
	30048	34592	4544	113.5
	30176	34624	4448	114
	30032	34560	4528	114.5
2	29568	34448	4880	115
3	28608	34512	5904	115.5
4	27328	34432	7104	116
5	26128	34304	8176	116.5
6	24976	34144	9168	117
7	24048	34288	10240	117.5
8	22912	34400	11488	118
9	21888	34640	12752	118.5
0	21024	34784	13760	119
1	20272	34784	14512	119.5
2	19552	34768	15216	120
3	19232	34816	15584	120.5
4	19520	34928	15408	121
5	19744	35120	15376	121.5
6	20224	35248	15024	122
7	21568	35136	13568	122.5
8	23024	34752	11728	123
9	23984	34624	10640	123.5
0	25200	34704	9504	124
1	26256	34656	8400	124.5
2	27200	34528	7328	125

Reference

MEDICAL NOW No.71 Special appendix (2012) P12-P13

MEDICAL NOW No.73 (2013) P48-P49

MEDICAL NOW No.75 (2014) P40-P41

MEDICAL NOW No.77 (2015) P50-P51

⚠ Caution Don't mark on the phantom with pen or leave printed materials contacted on its surface. Ink marks on the phantom will be irremovable.

• If you have any questions, please contact the dealer you purchased the product or Kyoto Kagaku Co., Ltd. below.

■ **Main Office and Factory (World Wide)**

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2021.09