

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



Table of contents

- Before use
 - Features P.1
 - Set includes and cautions P.1
 - Parts and specification P.2-P.5
- Analysis
 - Software download P.6
 - Slice thickness unit P.7-P.9
 - Uniformity unit P.10-P.12
 - Reconstruction interval unit P.13-P.16
- Reference P.17

Before use

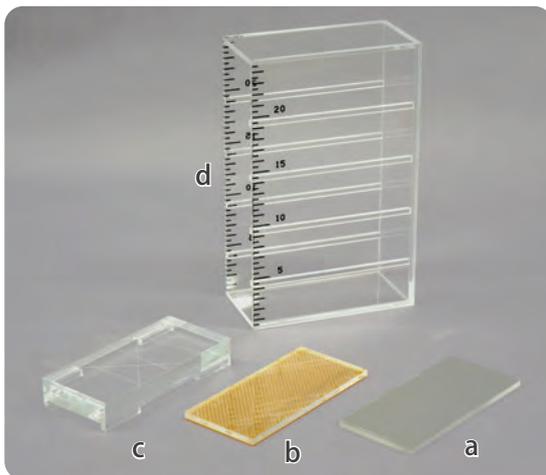
Features

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

- Evaluation items
 - Slice 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

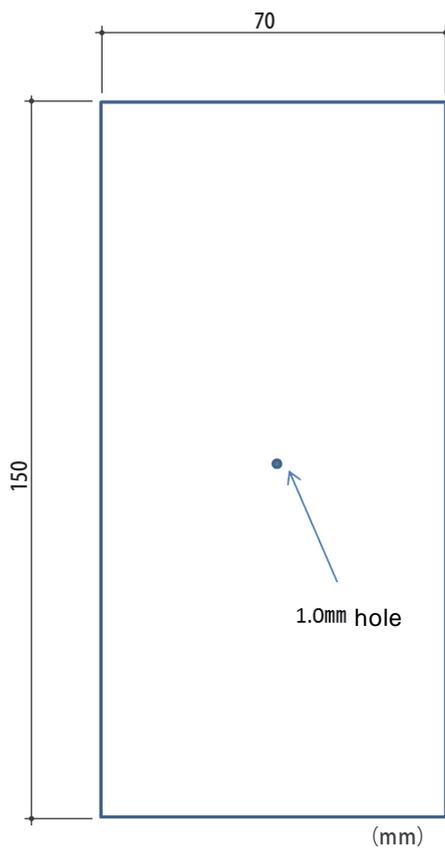
⚠ Cautions

- 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.

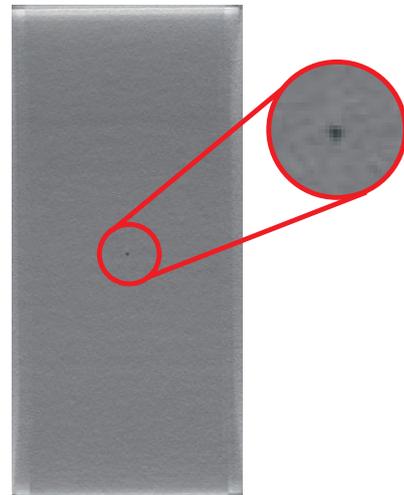
Phantom parts

a. Slice thickness

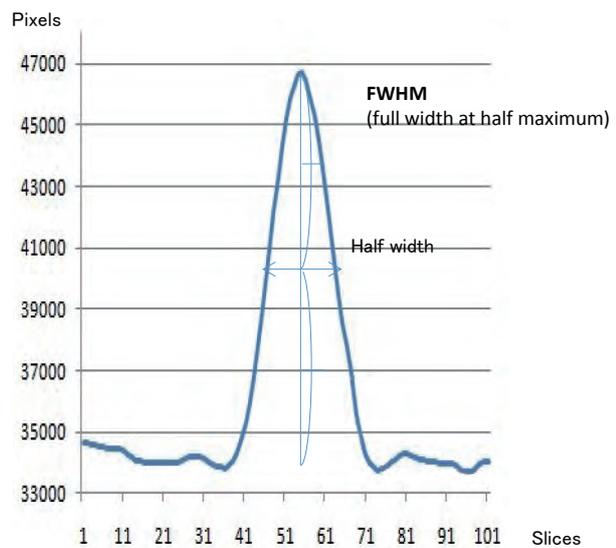
Material : Aluminium, Acrylic resin



Aluminium 0.5mm,
Acrylic resin 5mm



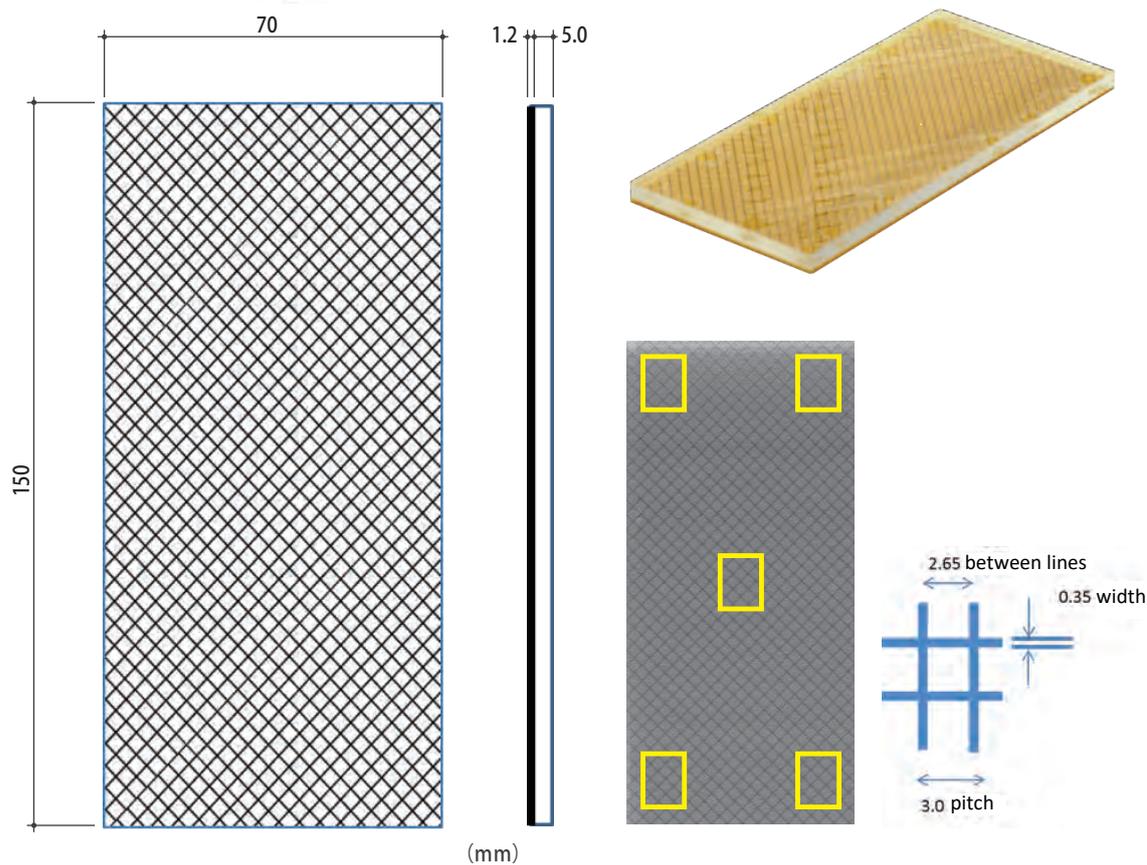
Slice thickness can be obtained by FWHM from acrylic hole in upper and bottom side.



Phantom parts

b. Uniformity unit

Material : Copper, bakelite, and acrylic resin

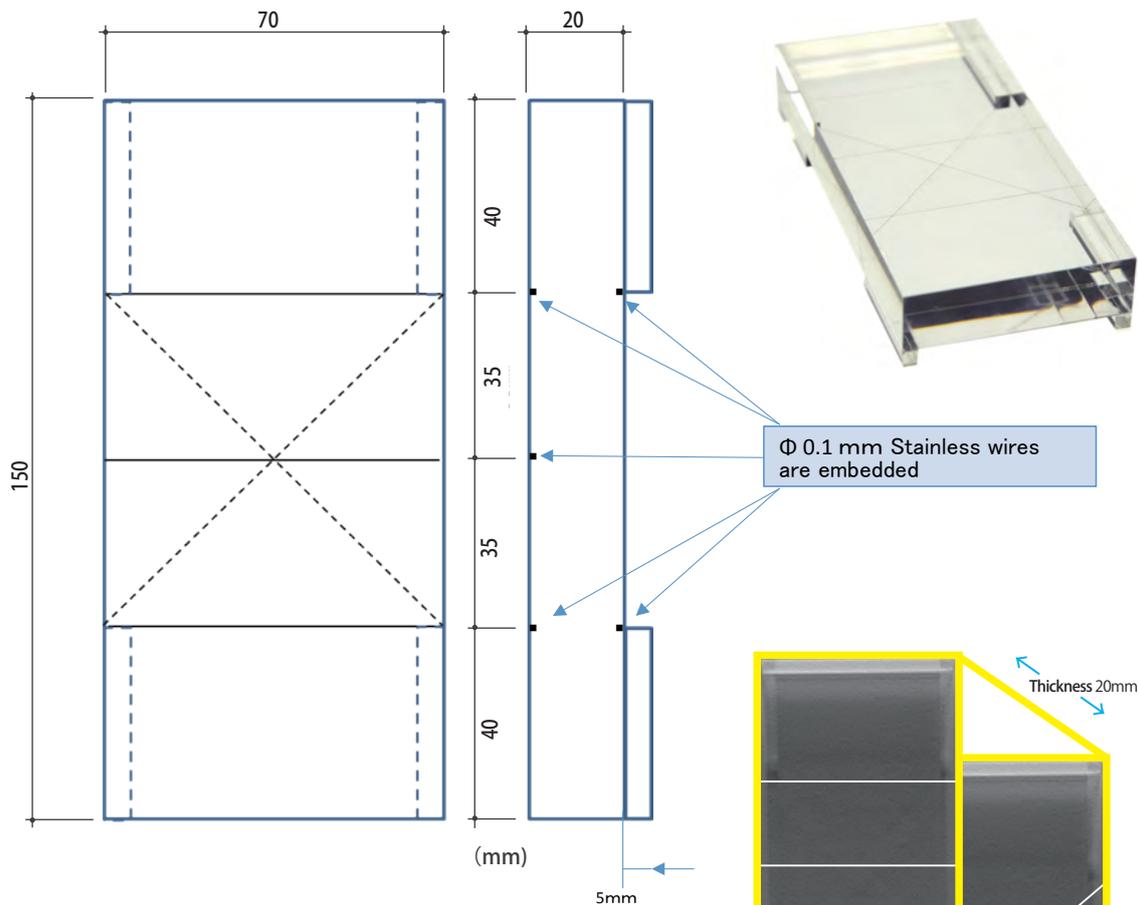


Set ROI to 5 measurement points. The surface whose difference of pixels between maximum and minimum are larger are defined as "in focus". Then check the uniformity and tilt of X-ray fluoroscopic table.

Phantom parts

c . Reconstruction interval unit

Material : 0.1 mm Stainless line、Acrylic resin

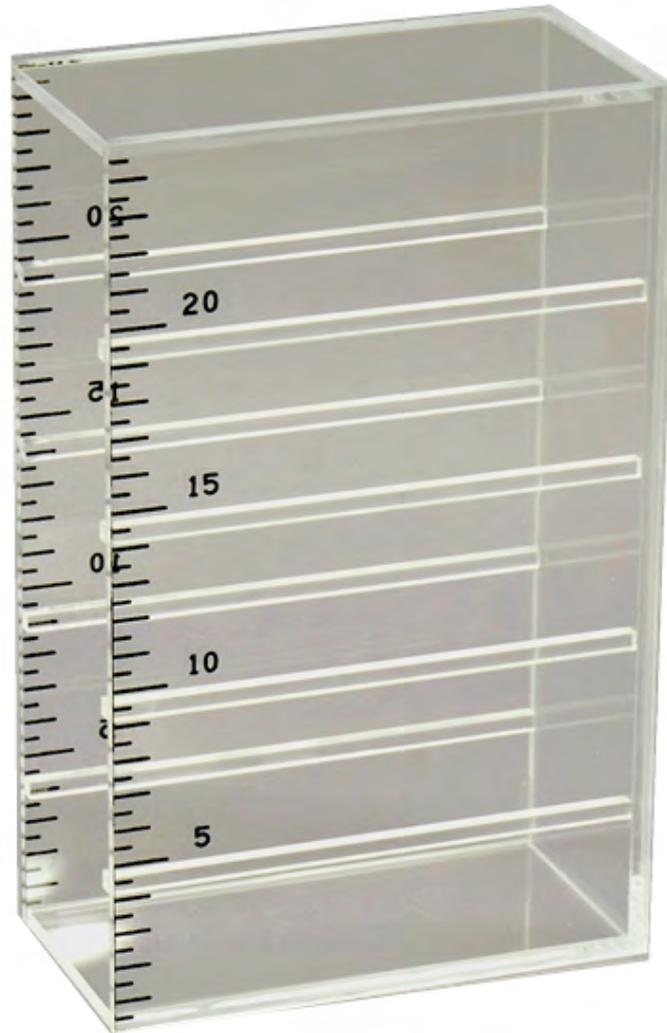


The surface whose differences of maximum and minimum lengths between three metal lines on the upper side and cross lines on the bottom side are defined as "in focus". Then check the reconstruction interval from the height.

Phantom parts

d. Height setting rack

Material: acrylic resin



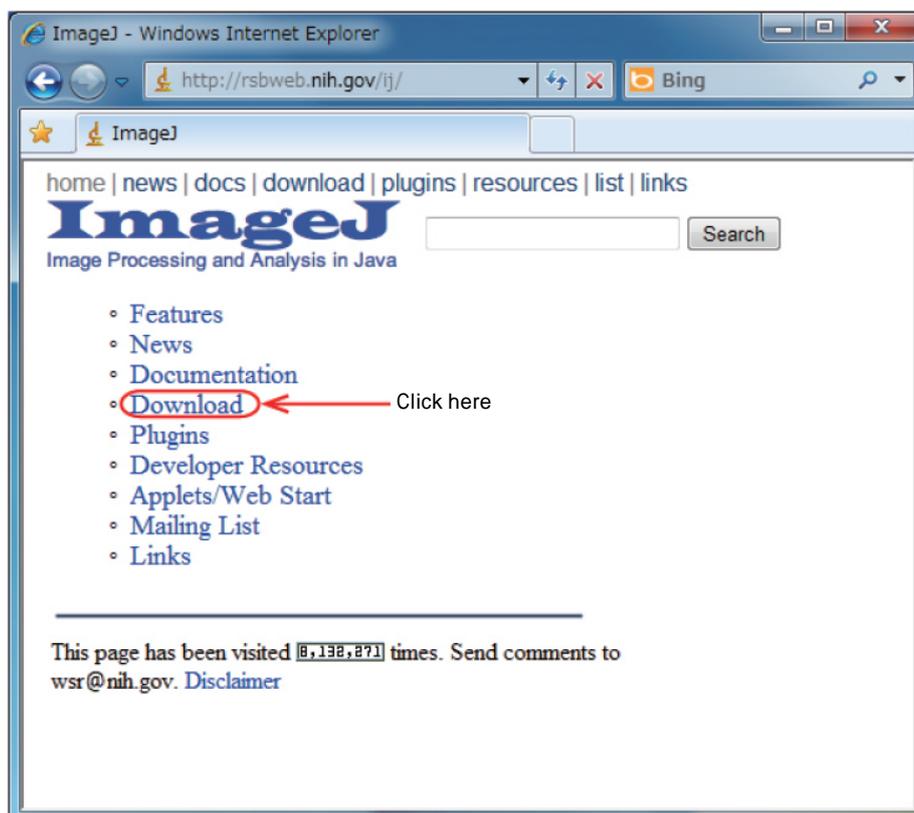
Test units can be set in the aluminum supporting box at 50, 100, 150, 200 (normally 100mm). Scales are shown so that the height from the floor can be shown.

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.

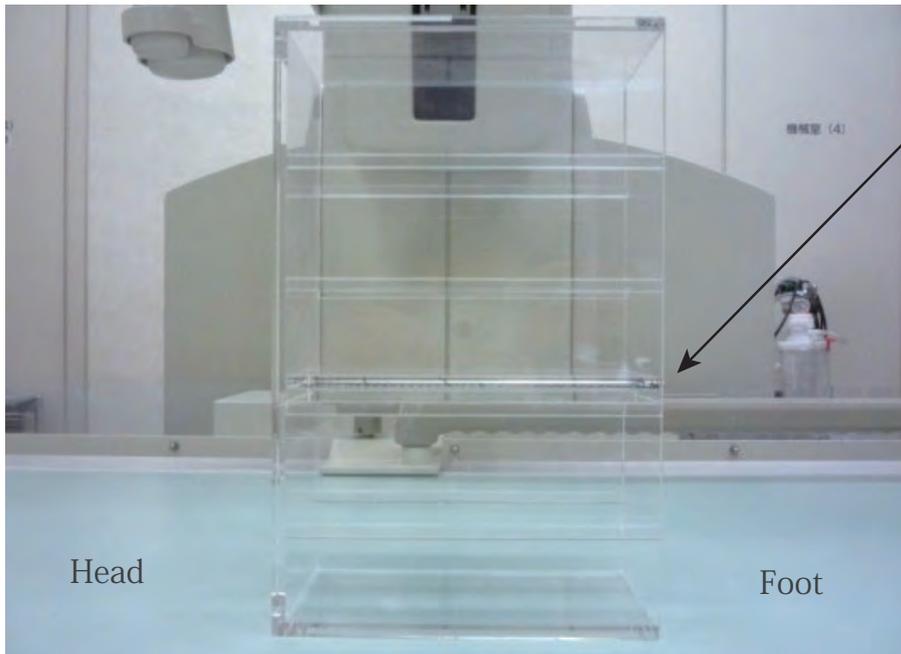


Image acquisition condition : Angle 40° , Slow , HAND F

Set with low condition first

Aluminum plate with hole(ϕ 1 mm)

Image acquisition data Thickness (+-)
0.5mm interval

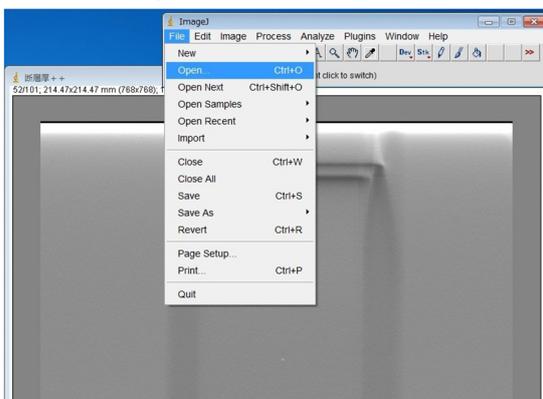


2 Slice thickness

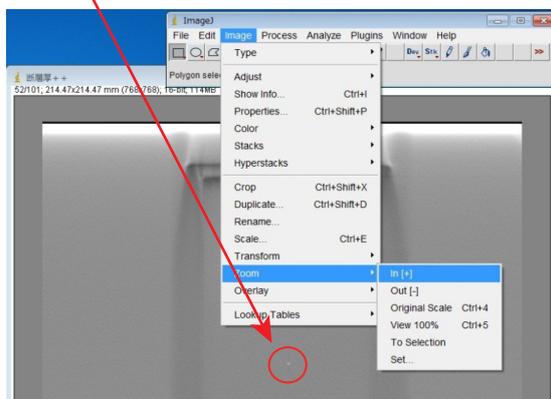
The data used in this manual are images without image procession.

One example using free software

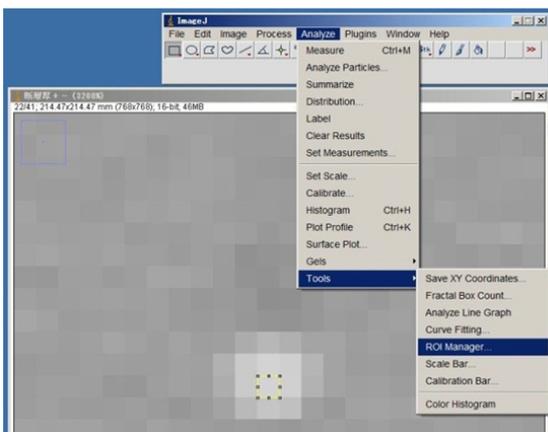
- ① Download image data
[File]→[Open]



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

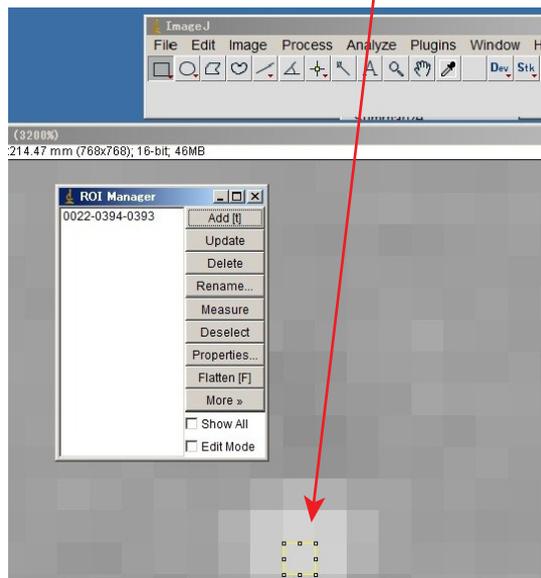


- ③ Cover 1 Pixel (white part)
[Analyze]→[Tools]→[ROI Manager]



- ④ Register all the reconstructed image to ROI address.

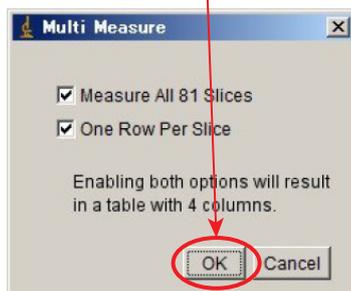
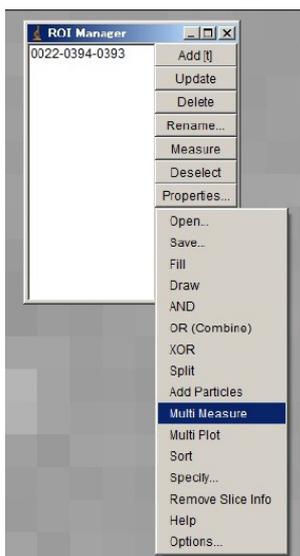
[ROI Manager]→[Add]



2 Slice thickness

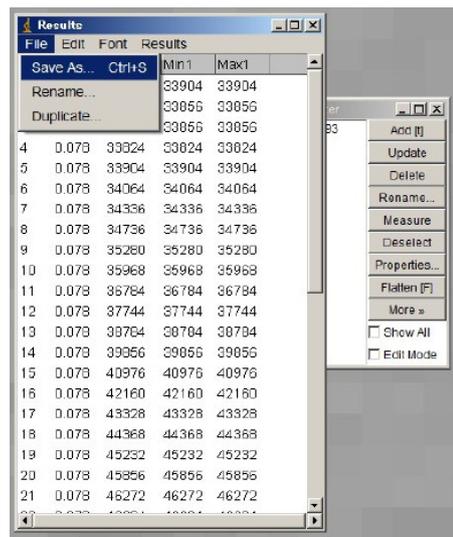
⑤ Register all the reconstructed image to ROI address.

[Add]→[More]→[Multi Measure]→[ok]



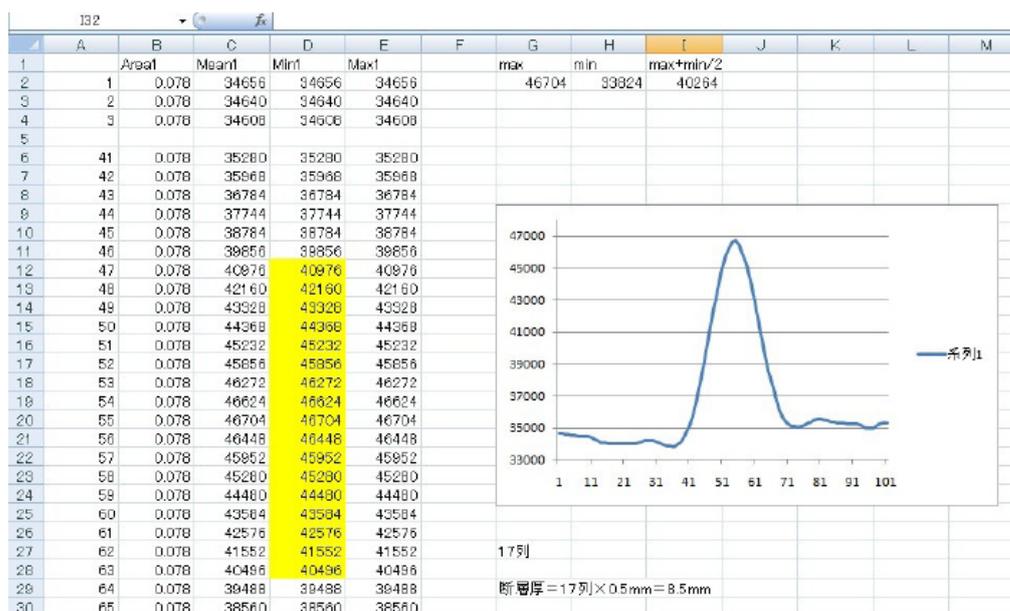
⑥ Save the result

[File]→[Save As]→File name
【Slice thickness(filter number)】



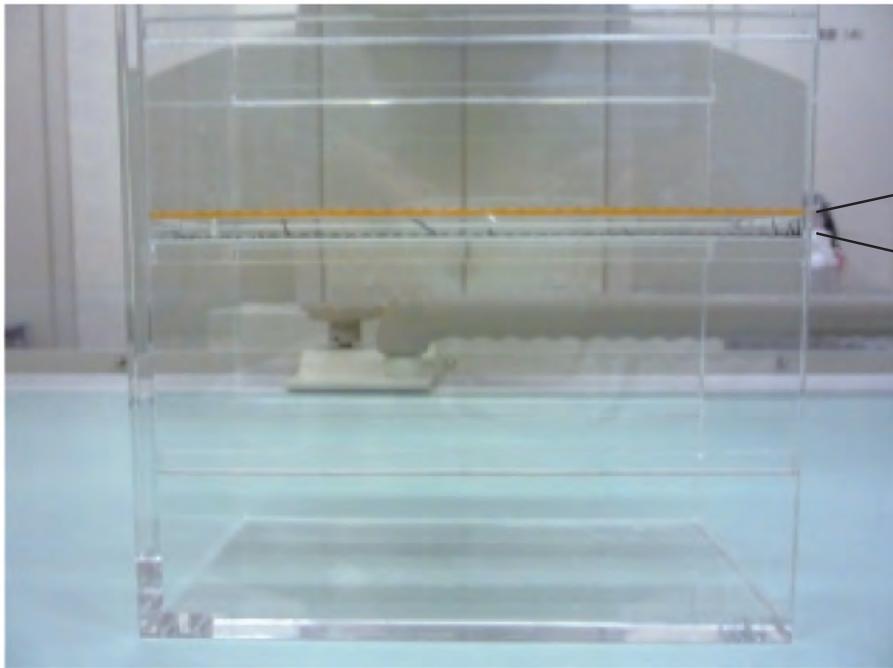
⑦ Calculate slice thickness

- 1 measurement = 0.5mm
- $(\text{max} + \text{min}) / 2 = \text{central point}$



3 Uniformity

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

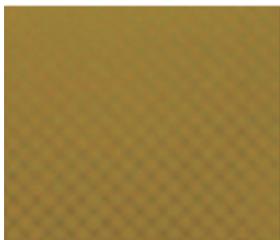


Grid plate
(thickness 1.2mm)
Acrylic plate
(thickness 5mm)

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

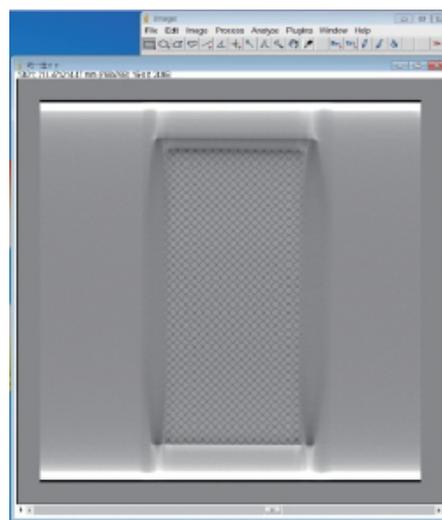
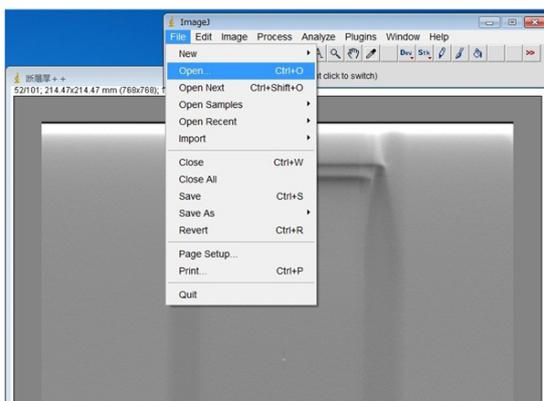
3 Uniformity

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

One example using free software

① Open image data

[File]→[Open]

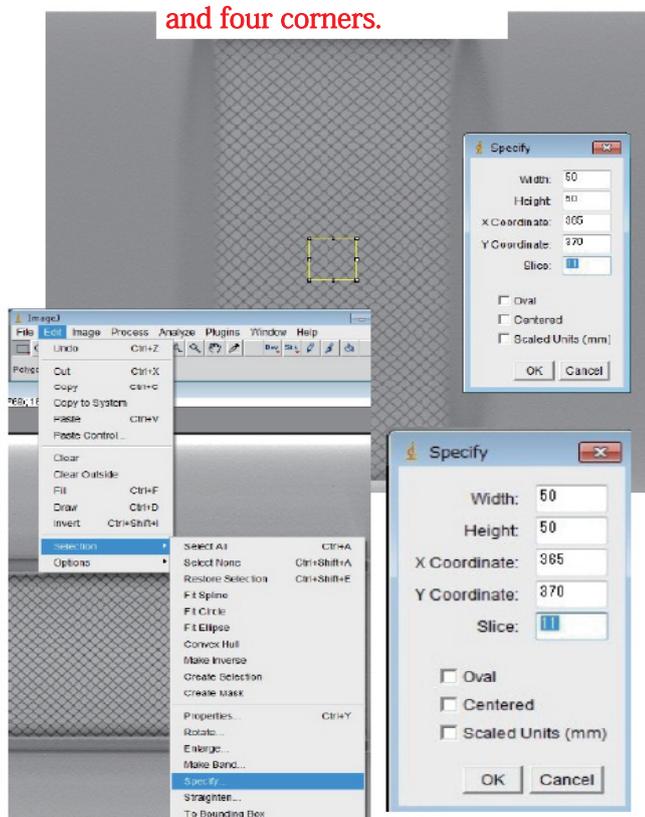


Set same ROI at the center and four corners.

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

[Edit]→[Selection]→[Specify]→Input value on right bottom.

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



One example using free software

3 Uniformity

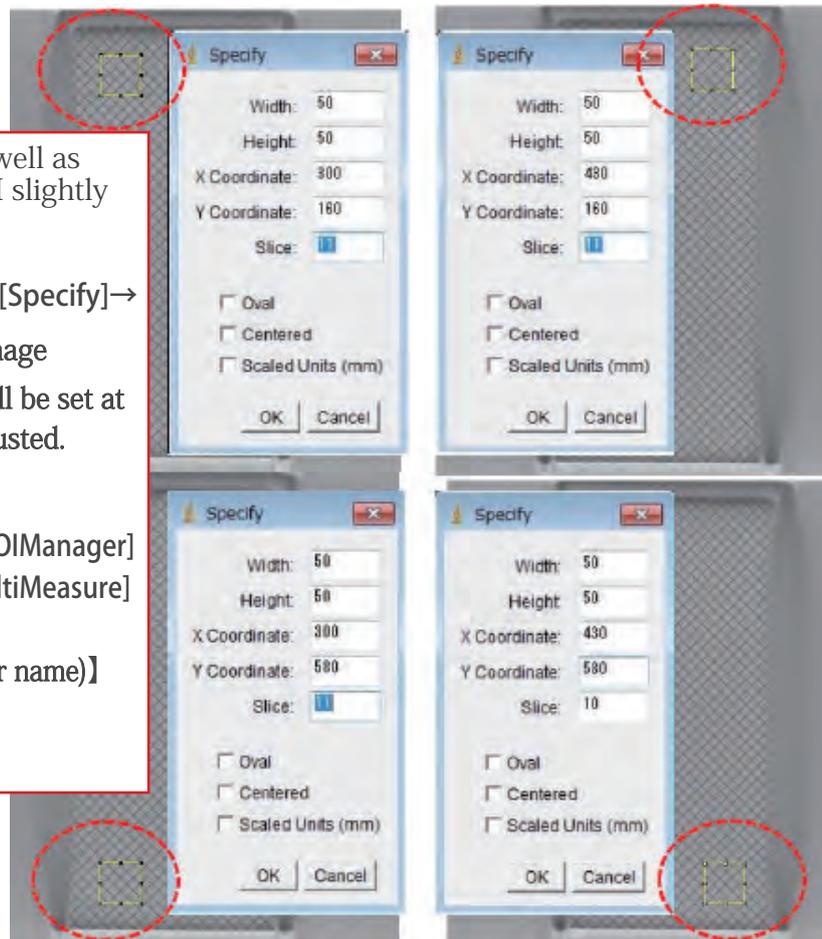
③ Measure center as well as four corners. Take ROI slightly inside the grid plate

[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)]

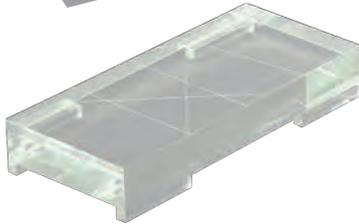
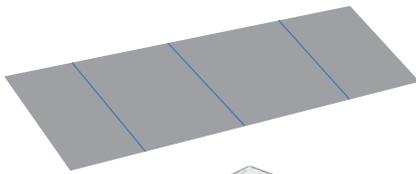


One example using free software

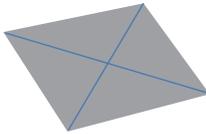
4 Reconstruction interval

Upper side

Height in focus 120mm



Bottom side



Height in focus 100mm

Set reconstruction interval unit to 95mm high

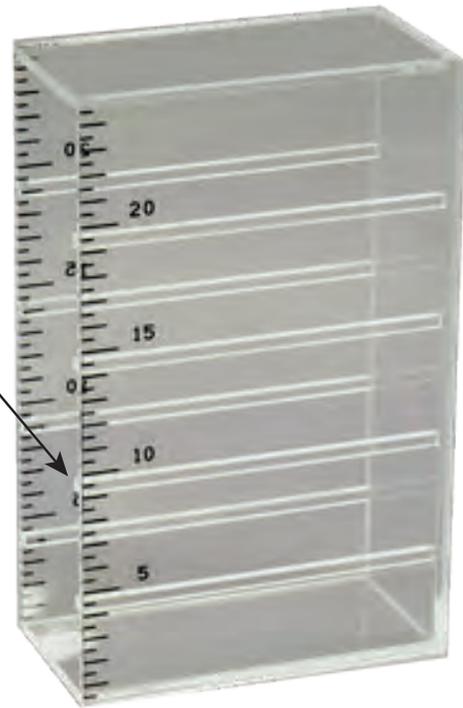


Image acquisition condition :
Angle 40°, Slow, HAND F

Image to be analyzed

Thickness (+-)
0.5mm interval

Height in focus
100mm



This image is a sample

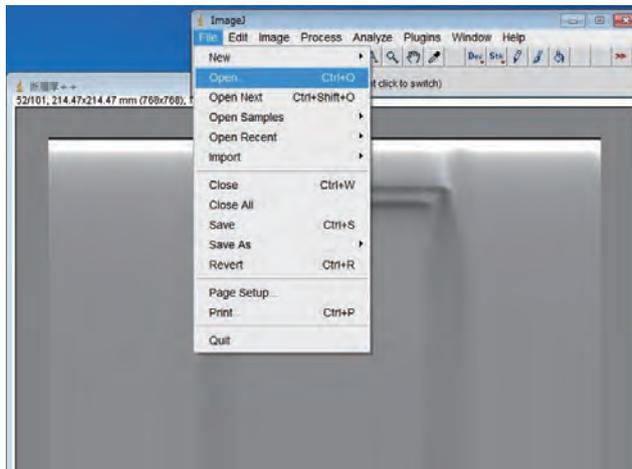
4 Reconstruction interval

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

One example using free software

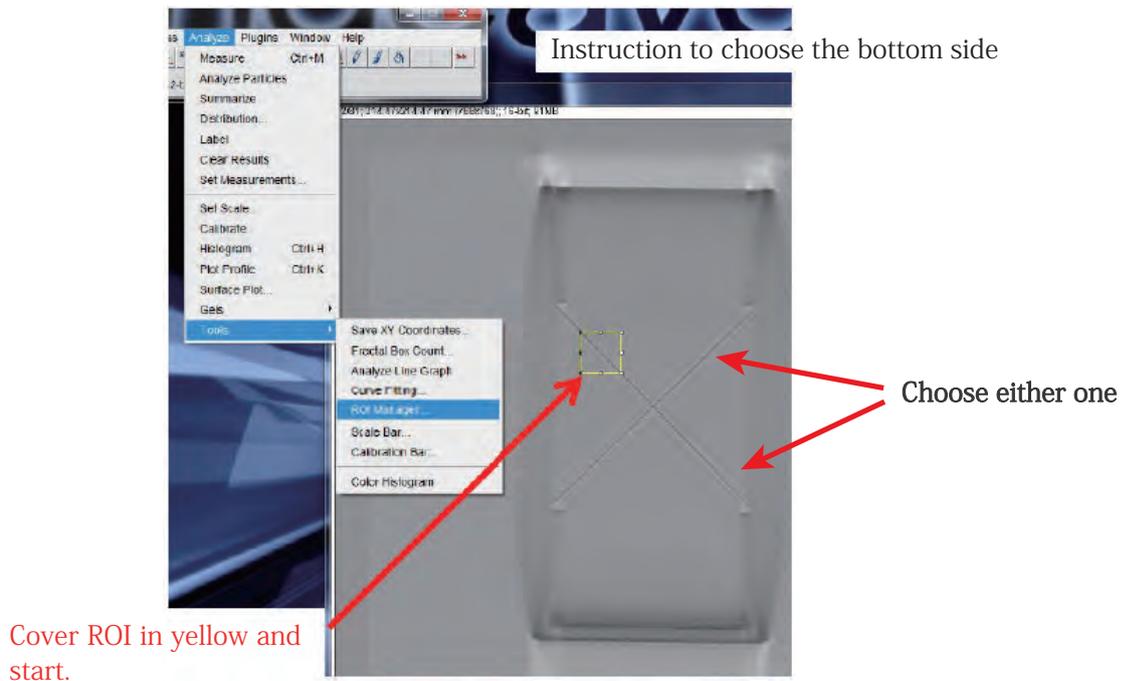
① Open image data

[File]→[Open]



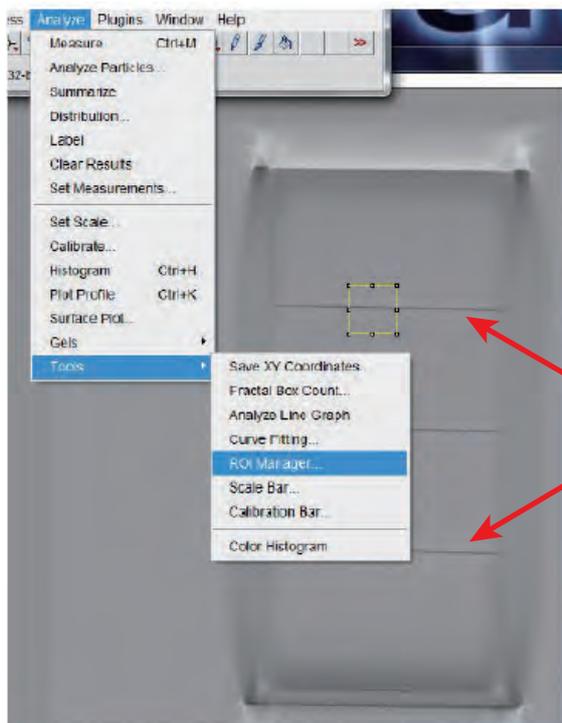
② Choose one image which is visually in focus

[Analyze]→[Tools]→[ROI Manager]



4 Reconstruction interval

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

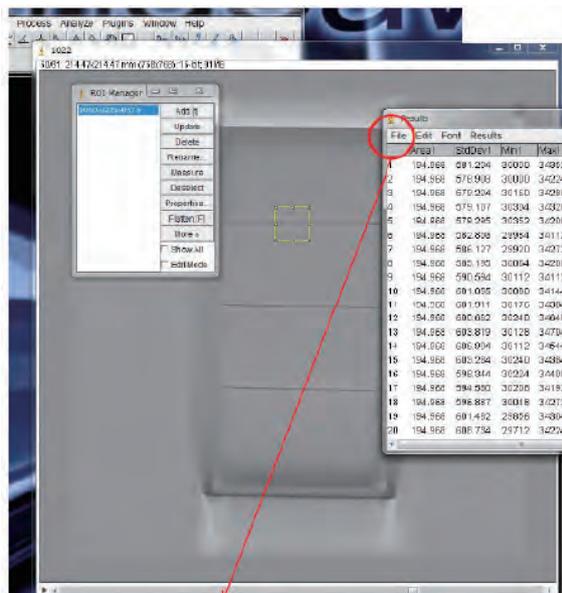


Instruction to choose the bottom side

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.

	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	100
23	21040	35840	14800		100.5
24	21104	35728	14624		101
25	21248	35568	14320		101.5
26	21840	35344	13504		102
27	22608	35072	12464		102.5

3	29360	34656	5296	110.5	
4		48	4768	111	
5		56	4800	111.5	
6		24	4816	112	
7		08	4640	112.5	
8		80	4560	113	
9		30048	34592	4544	113.5
10		30176	34624	4448	114
11		30032	34560	4528	114.5
12		29568	34448	4880	115
13		28008	34512	5904	115.5
14		27328	34432	7104	116
15		26128	34304	8176	116.5
16		24976	34144	9168	117
17		24048	34288	10240	117.5
18		22912	34400	11488	118
19		21888	34640	12752	118.5
20		21024	34784	13760	119
21		20272	34784	14512	119.5
22		19552	34768	15216	120
23		19232	34816	15584	120.5
24		18520	34928	15408	121
25		18744	35120	15376	121.5
26		20224	35248	15024	122
27		21568	35136	13568	122.5
28		23024	34752	11728	123
29		23984	34624	10640	123.5
30		25200	34704	9504	124
31		26256	34656	8400	124.5
32		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.

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2021.09

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