
3D Accuitomo 170
J.MORITA MFG.CORP.

THE NEW WORLD OF THE 80 µm VOXEL

SUPER RESOLUTION: 80 µm VOXEL

Low Patient Effective Dose

High Quality Images with Low X-Ray Radiation

Four Imaging Modes

A mode to serve every purpose. High Resolution Mode and High Fidelity Mode can be used for even higher quality images. High Speed Mode reduces motion artifacts. Use Standard Mode for both limited and broad fields of view.

Nine Sizes for Field of View (FOV)

Choose from nine sizes for the FOV with diameters ranging from170 mm to 40 mm to minimize x-ray dosage.

Five Resolution Levels

Select the voxel size, 80 µm, 125 µm, 160 µm, 200 µm, or 250 µm, that best suits your diagnostic needs.

Zoom Reconstruction

Use the original exposure data to zoom in on critical areas using voxel sizes as small as 80 µm.

Compact

Space-saving dimensions : W 1,620 mm x D 1,250 mm (63-3/4″ x 49-1/4″)
Recommended minimum room size : W 2,000 mm x D 1,800 mm (6-3/4′ x 6′)

DICOM Compatible (option)

Viewing Software

With these native Morita software packages, you can view and manipulate the 3D-CT image data even on a computer that does not have i-Dixel software.

80 μm SUPER HIGH RESOLUTION

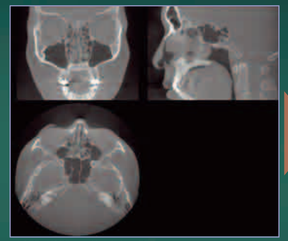
SELECT A REGION OF INTEREST SUCH AS THE TEMPORAL BONE, PARANASAL SINUS, JAWBONE OR INDIVIDUAL TEETH AND OBSERVE IT WITH 80 μm VOXEL RESOLUTION FOR GREATER DETAIL.

Five Resolution Levels

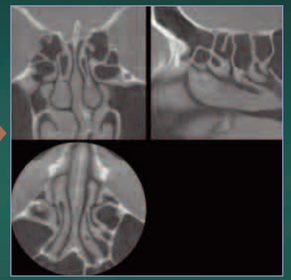
Select voxel size, 80 μm, 125 μm, 160 μm, 200 μm, or 250 μm, that best suits your diagnostic needs.
*Depending on the size of the Field of View, some voxel sizes may not be possible.

Zoom Reconstruction

Use the original exposure data to zoom in on critical areas using a voxel size as small as 80 μm.
For a higher resolution image, a specified area can be recalculated and reconstructed using a smaller voxel size.



φ 170×H120 mm, Voxel size : 250 μm



φ 50×H50 mm, Voxel size : 80 μm

FOUR IMAGING MODES

HIGH RESOLUTION MODE AND HIGH FIDELITY MODE CAN BE USED

for even higher quality images. High speed mode reduces motion artifacts. Use Standard Mode for both limited and broad fields of view.

High Resolution Mode (Hi-Res)

This is the highest resolution. Exposures are made at one-fourth the size of the detector pixels for the greatest spatial resolution. Ideal for observation of delicate bone structures such as the ossicular chain.

High Fidelity Mode (Hi-Fi)

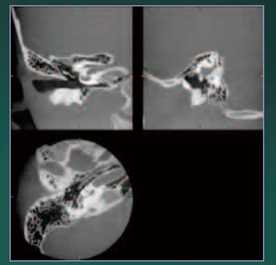
This mode has high data density data to make clearer and sharper images. This is especially good for performing zoom reconstructions.

High Speed Mode (Hi-Speed)

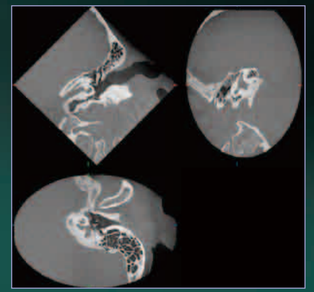
Full scan: 10.5 sec. Half scan: 5.4 sec.
Reduces motion artifacts. Good for children or others with difficulty remaining motionless.

Standard Mode (Std)

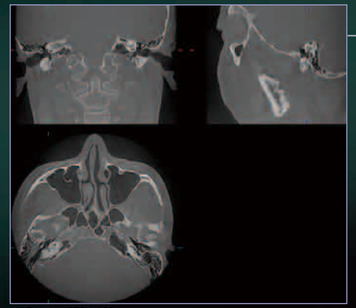
Suitable for limited and wide views of temporal bone, paranasal sinus, maxilla and mandible, individual teeth etc.



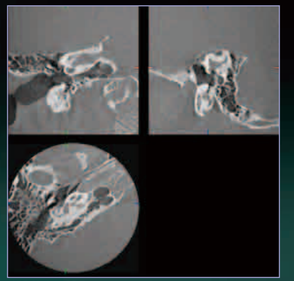
Std Mode φ 60 mm



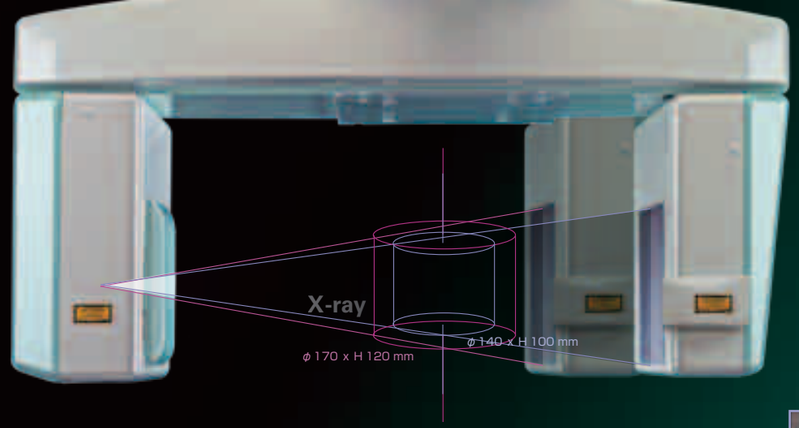
Hi-Res Mode φ 60 mm



Hi-Fi Mode φ 170 × 120 mm



Hi-Fi Mode φ 60 Zoom reconstruction



FLAT PANEL DETECTOR (FPD) POSITION ADJUSTMENT

Adjusting the position of the FPD reduces x-ray dosage, provides higher resolution, and minimizes distortion.
For regions such as ø 140 X 100 mm, moving the FPD slight farther away from the center of the exposure area results in a more nearly orthographic projection, which reduces distortion and improves resolution.
Optimizing collimation of the beam depending on the size of the area also reduces x-ray dosage and x-ray scattering as well.

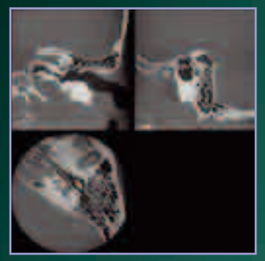
NINE EXPOSURE REGION SIZES

There are nine sizes for exposure **regions with diameters ranging from 170 to 40 mm**.

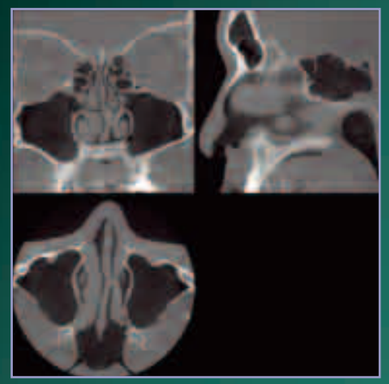
Diameter	X	Height (mm)			
ø 170	X	120 mm	ø 170	X	50 mm
ø 140	X	100 mm	ø 140	X	50 mm
ø 100	X	100 mm	ø 100	X	50 mm
ø 80	X	80 mm			
ø 60	X	60 mm			
ø 40	X	40 mm			

RESOLUTION STAYS HIGH FOR EVEN LARGE AREAS

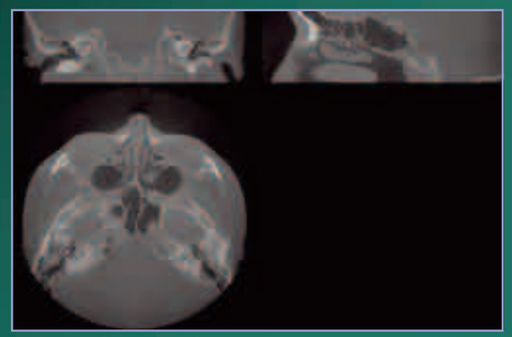
Resolution stays high and distortion is minimized for all regions from the smallest (ø40 X 40 mm) to the largest (ø170 X 120 mm).



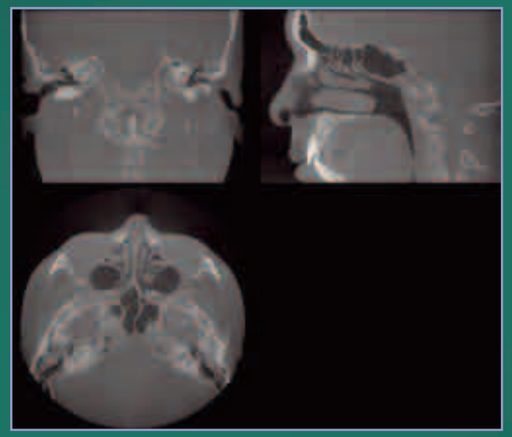
Temporal bone : ø 60 × H 60 mm



Paranasal sinuses : ø 100 × H 100 mm

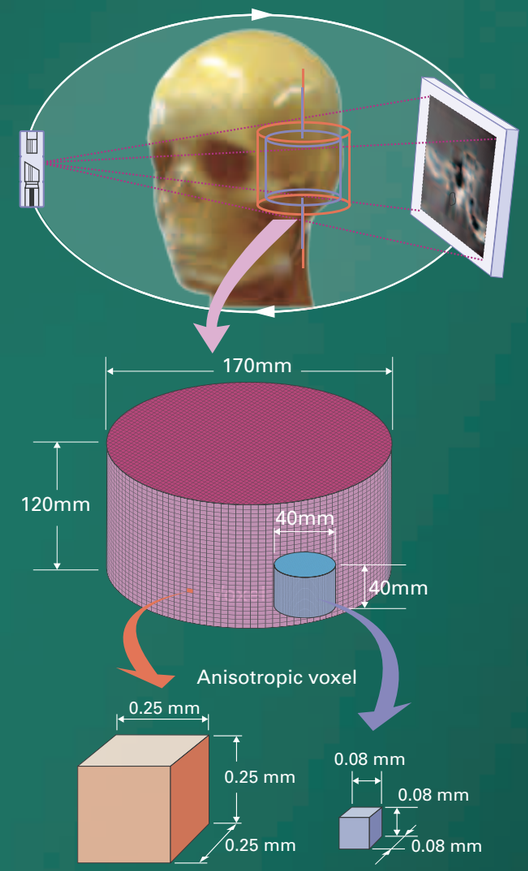


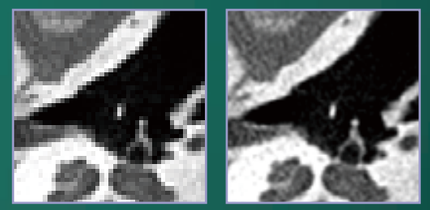
Observation of the paranasal sinuses together with right and left temporal bone : ø 170 × H 50 mm



Observation of the paranasal sinuses together with right and left temporal bone : ø 170 × H 120 mm

CONE BEAM CT RADIOGRAPHY





voxel size: 250 µm *voxel size: 80 µm*

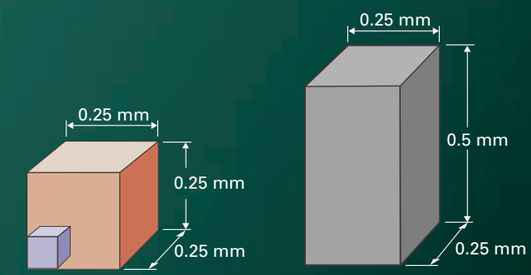
Enlarged yet smooth and distortion-free 80 µm high resolution images

Principle

The arm rotates 360° around the center of the exposure region in 18 seconds (Standard Mode) as the x-ray head emits a cone-shaped beam. The multiple projections created during the arm's rotation are converted to a digital signal by the flat panel detector and transmitted to the computer. After any necessary supplemental or corrective processing, the digital information is converted into a three dimensional CT image using an image reconstruction algorithm, and a high resolution image appears on the computer's display.

Low X-Ray Dosage

Compared to the CTDIw value for exposures of the head and neck region, the x-ray dosage for a standard 18-second exposure is less than one-seventh* of that for a conventional CT scan. (This is based on Morita's actual measurements.)



Isotropic cubic voxel (3D Accuitomo)

Anisotropic voxel (Conventional CT)

Features of the Isotropic Cubic Voxel

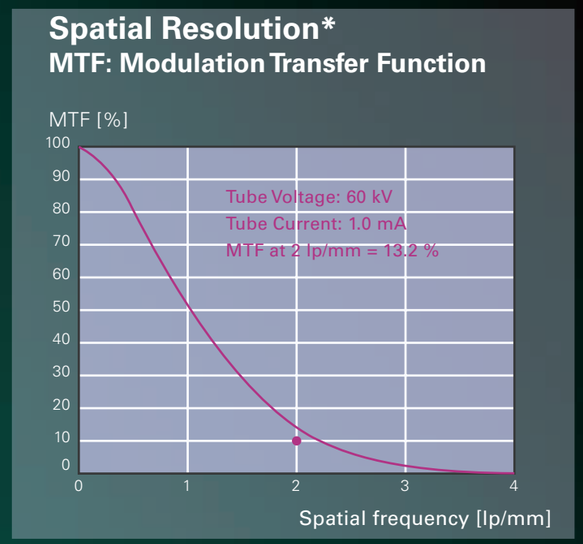
The voxel of 3D Accuitomo is an isotropic cube that produces images with equally fine detail in all three dimensions and minimizes artifacts produced by slice pitch and helical pitch; therefore resolution is never degraded by re-slicing. Conversely the rectangular voxel used for conventional CT imaging results in some image degradation when it is re-sliced.

Voxel: The minimum unit of 3D data.

** Comparison of the CTDIw value based on IEC60601-2-44 under Morita's recommended exposure conditions and the CTDIw diagnostic reference level for the face and paranasal sinal regions according to ICRP Pub. 87, appendix A.*

HIGH QUALITY 3D-CT IMAGES WITH LOW X-RAY RADIATION

USING A HIGH-SENSITIVITY, HIGH-RESOLUTION flat panel detector, high quality and extremely detailed images of the many regions of the head and neck such as the temporal bone, paranasal sinuses, eye sockets, mandible, and cranial base can be obtained for a wide range of multi-purpose diagnostic scanning.

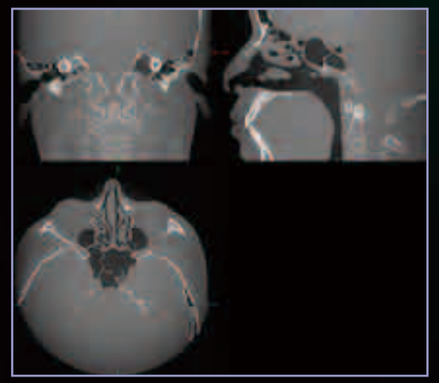


This function is based on data from a typical product.

Flat Panel Detector (FPD)
FPD conversion of x-ray exposure into a digital signal results in a dramatic improvement in image quality and a reduction in x-ray dosage. The FPD is not affected by magnetic fields and has superb sensitivity and resolution to produce superior 3D-CT images with a minimum of distortion and a wide dynamic range expressed with a rich distribution of the gray scale.

X-rays are converted into visible light by the directly deposited CsI scintillator and then the light is converted into an electrical signal by a photo diode. The FPD is quite thin and has a long working life.

High Resolution
Detailed images have a resolution of at least 2.0 lp/mm (MTF 10%) with a voxel size of 80 µm.



Highly detailed imaging

Minimal Distortion
The flatness of the detector minimizes distortion. This eliminates the necessity of making corrections for distortion before reconstructing images as is the case for analog systems.

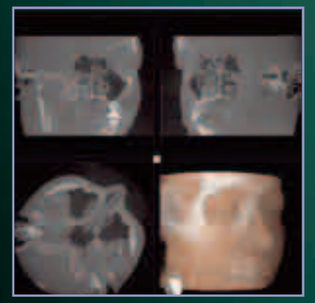
Wide Dynamic Range **
The Flat Panel Detector (FPD) has a wide dynamic range of 14 bit data (64 times 8 bit data). This produces a richer and truer gray scale.

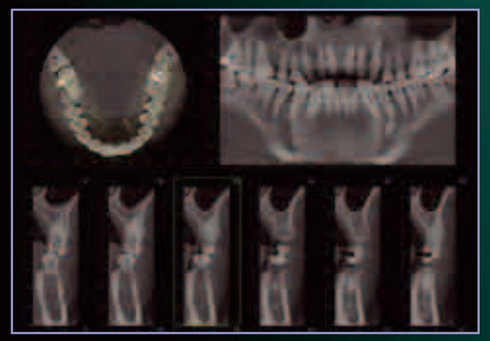
** Spatial resolution refers to how distinct an image appears the smaller it becomes; it measures the fineness of an image. Spatial frequency is the unit of measurement of line pairs per distance (mm). As the map scale decreases, the patterns of contrast become harder to see. This is known as MTF (Modulation Transfer Function). It represents the number of line pairs per 1 mm that can be distinguished based on contrast. It is said that humans can only differentiate about 10%.*

*** Dynamic range: Numerical values express the reproducibility of the signal and the ratio of the largest and smallest input values in dBs. The dynamic range of the digital signal is also sometimes expressed in bits. The highest signal level is taken to be the level remaining after subtracting the noise level. The value of the dynamic range indicates how weak of a signal can be reproduced – or, in other words, how high the contrast resolution will actually turn out to be.*

i-Dixel IMAGE PROCESSING SOFTWARE

i-Dixel IMAGE PROCESSING SOFTWARE can be used as a database to archive a wide variety of image information. Its multiple image processing functions can easily access and manipulate many types of information for 2D and 3D images.





Volume Rendering
Volume rendering of CT data produces three dimensional images.
Select the area of interest and adjust the controls for the histogram to create a detailed image of very fine structures.

Real Time Re-Slice
Slices and volume rendered images can be linked and easily manipulated in real time.

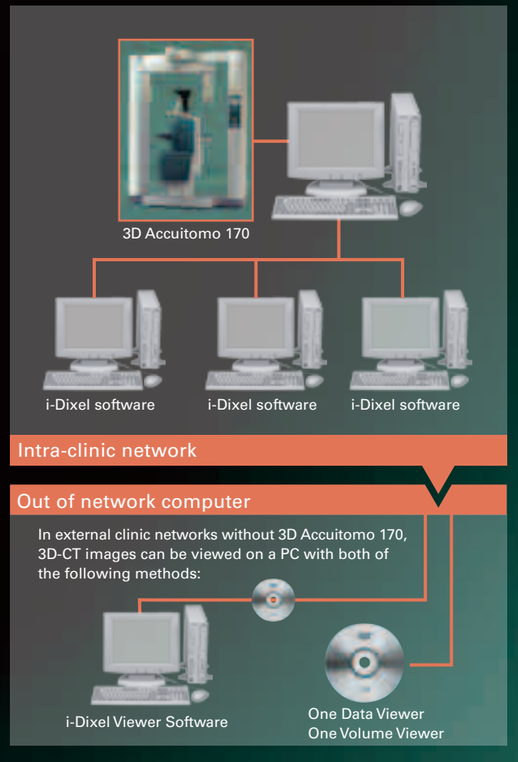
Curved MPR (cMPR)
This way of image processing allows you to observe an orthogonal representation of the dental arch or any arbitrary curve.

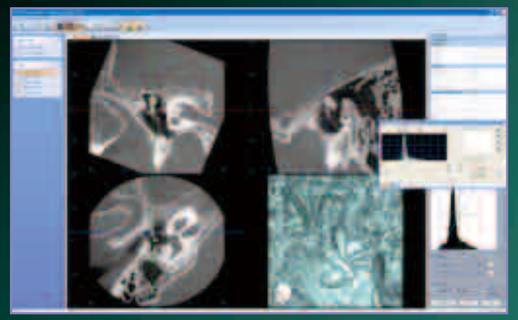
Report Comments
It is easy to enter comments for any image. These comments can be printed with a conventional Windows printer or a DICOM printer.

Other Key Features
- XYZ view windows
- Re-slice
- Zoom
- Rotate
- Histogram
- Edge Enhancement
- Distance and Angle Measurement
- Negative Image
- Mirror image
- Slice Distance Measurement
- Surface Rendering
- DICOM 3.0 Compatible
- Brightness Conversion
- Spatial Frequency Filter
- Patient Orientation Display
- Density Measurement

SHARING IMAGE DATA

INSTALLING I-DIXEL SOFTWARE on all intra-clinic computers enables sharing of image data on each linked client computer. Observation of images on non-network computers can be achieved with the One Data Viewer, and the One Volume Viewer without installing i-Dixel.





One Volume Viewer

One Data Viewer & One Volume Viewer Software

These unique Morita applications let you view three dimentional images and volume rendered images even if the computer does not have i-Dixel software installed.

CT data can be exported from the i-Dixel application and later stored on a DVD. This DVD can then be used on a computer outside the clinic to view CT images, volume rendered images and patient information.

Additional functions include zoom, black and white reverse, brightness, and contrast adjustment as well as optional length and angle measurement capabilities.

i-Dixel conforms to the following DICOM standards:

1. Modality worklist management service class
2. Storage service class
3. Modality performed procedure step service class
4. Print management service class

SIMPLE, ACCURATE POSITIONING

THE SCOUT POSITIONING SYSTEM IS EASY AND ACCURATE.

USE THE TRIPLE BEAM POSITIONING SYSTEM FOR EVEN GREATER PRECISION.

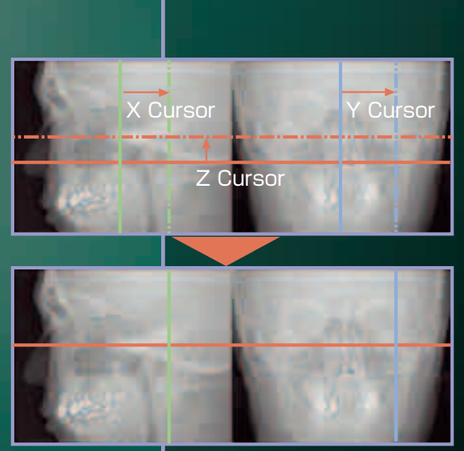
Two-Direction Scout

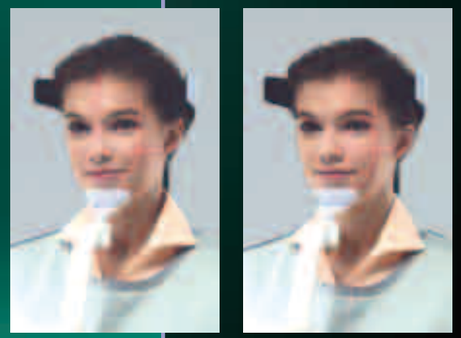
The region of interest can be easily targeted by making images from two directions. Then you can simply click on the images to specify the center of the region of interest. This information is transmitted to the x-ray unit, and the chair automatically moves into position.

The Scout exposure (80 kV and 2.0 mA) will increase the total x-ray dosage of a Standard Mode CT exposure (90 kV and 5.0 mA) by about 2%.

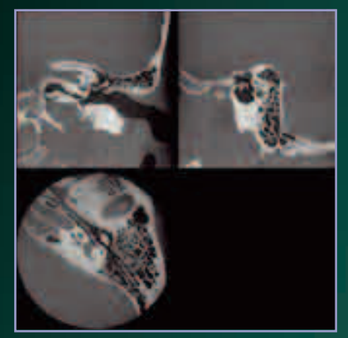
Easy High Precision

The region of interest can be easily targeted using the three positioning laser beams. The patient's head is safely and securely stabilized by the chinrest and headrest.





3D-CT image
Region of interest is well centered.

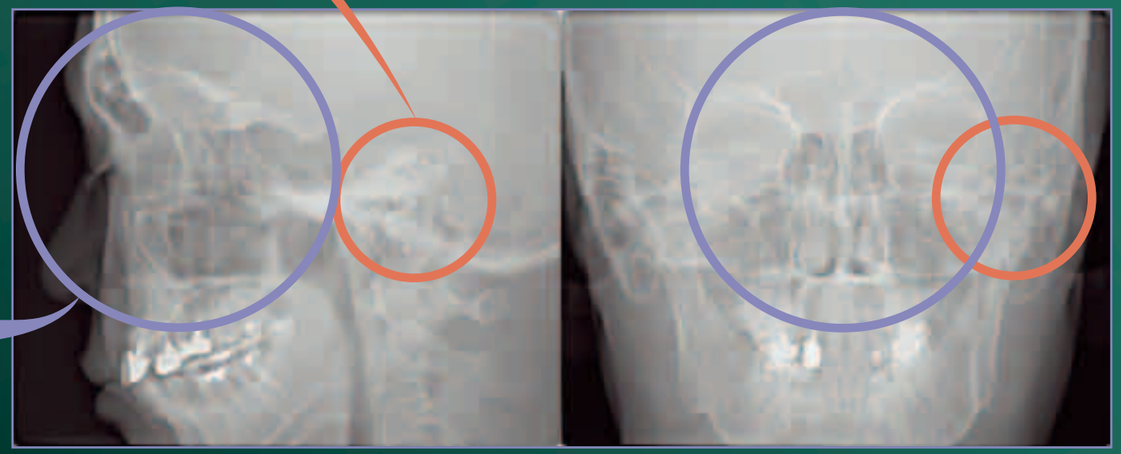


LIMITED CT IMAGE AREA FOR REDUCED X-RAY DOSAGE

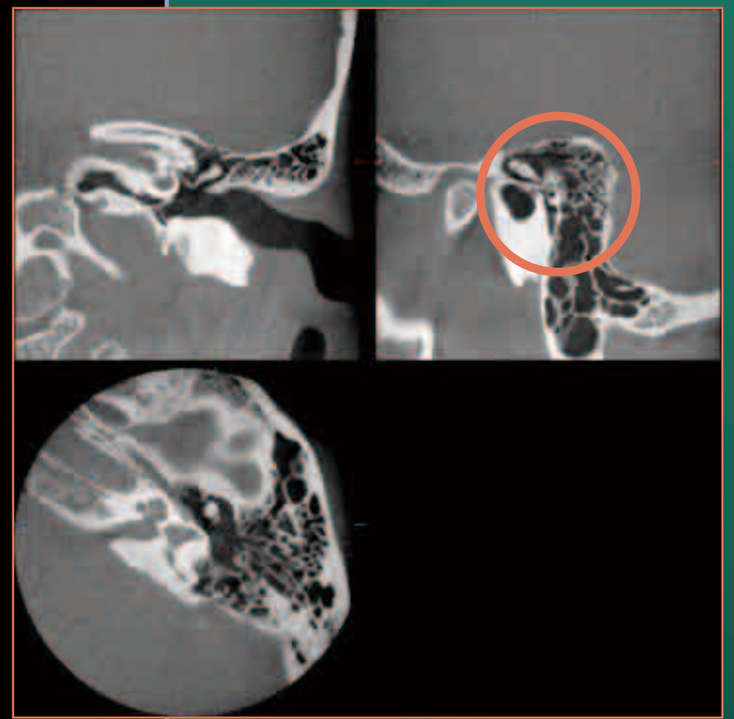
LIMIT THE X-RAY DOSAGE Use scout to accurately determine the minimal region of interest before exposing the patient to the highter dosage CT scan

IMAGING AREA : Diameter X Height (mm)

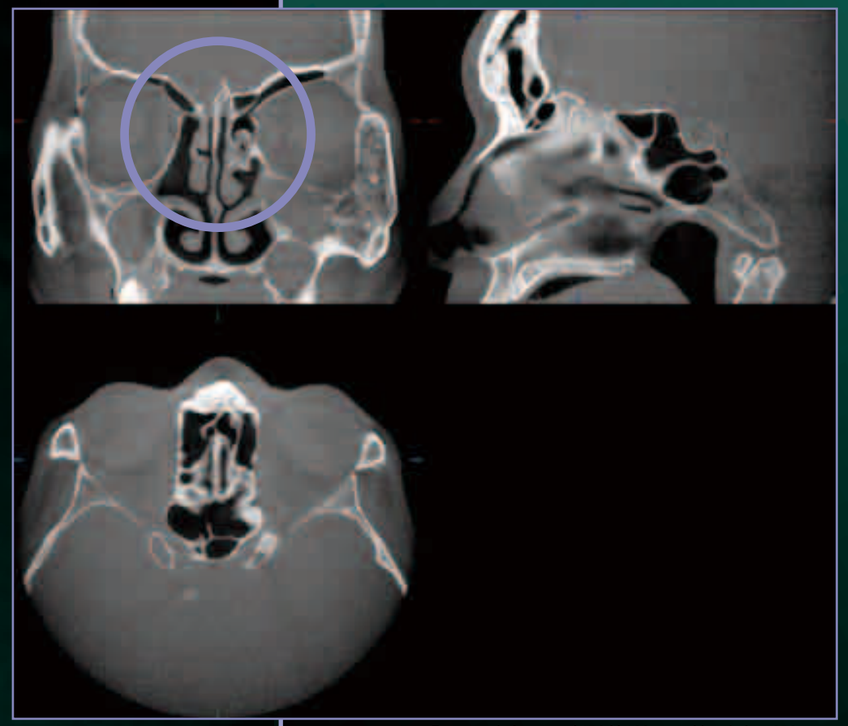
ø 170 X 120 mm	ø 170 X 50 mm
ø 140 X 100 mm	ø 140 X 50 mm
ø 100 X 100 mm	ø 100 X 50 mm
ø 80 X 80 mm	
ø 60 X 60 mm	
ø 40 X 40 mm	



Scout Image

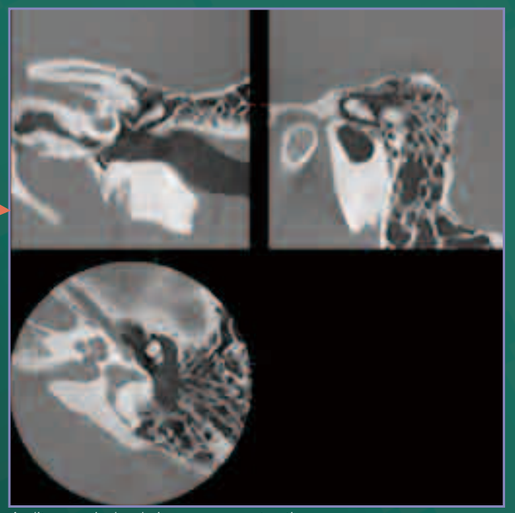


Temporal Bone. ⌀60 X 60 mm. Voxel size: 125 µm

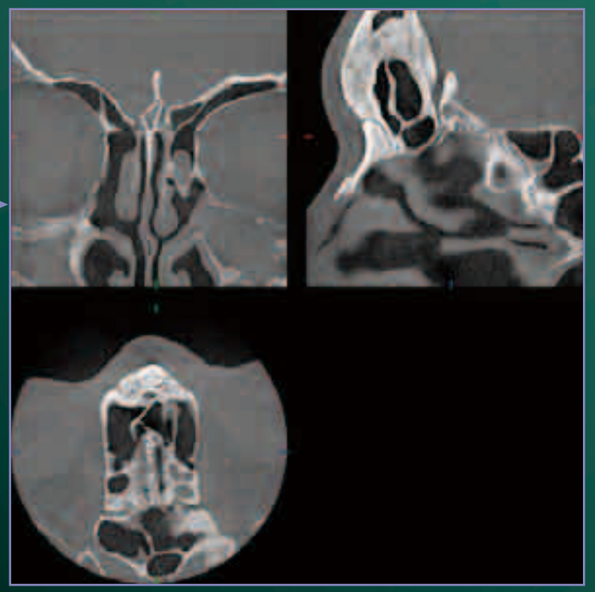


Paranasal sinuses ⌀170 X 120 mm. Voxel size: 250 µm

ZOOM RECONSTRUCTION WITH 80 µm VOXEL RESOLUTION

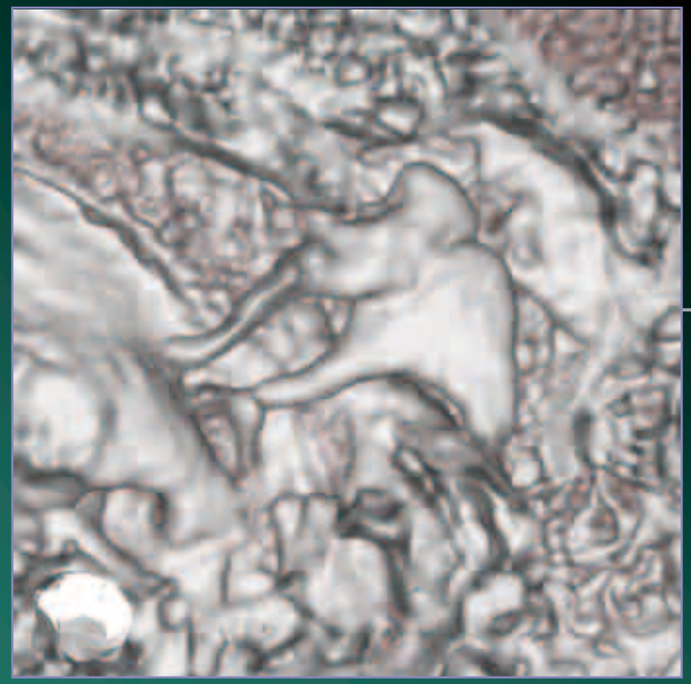


Auditory ossicular chain zoom reconstruction



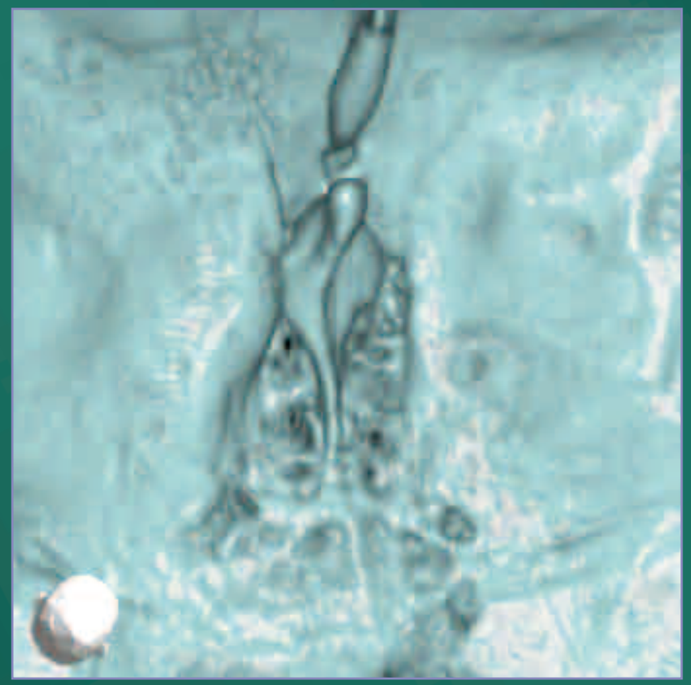
Ethmoid sinus zoom reconstruction

Select a region of interest such as the temporal bone or paranasal sinus and zoom in with 80 µm voxel resolution for a more detailed observation.



Auditory ossicular chain

Volume rendering produces a detailed 3D view of internal structures.

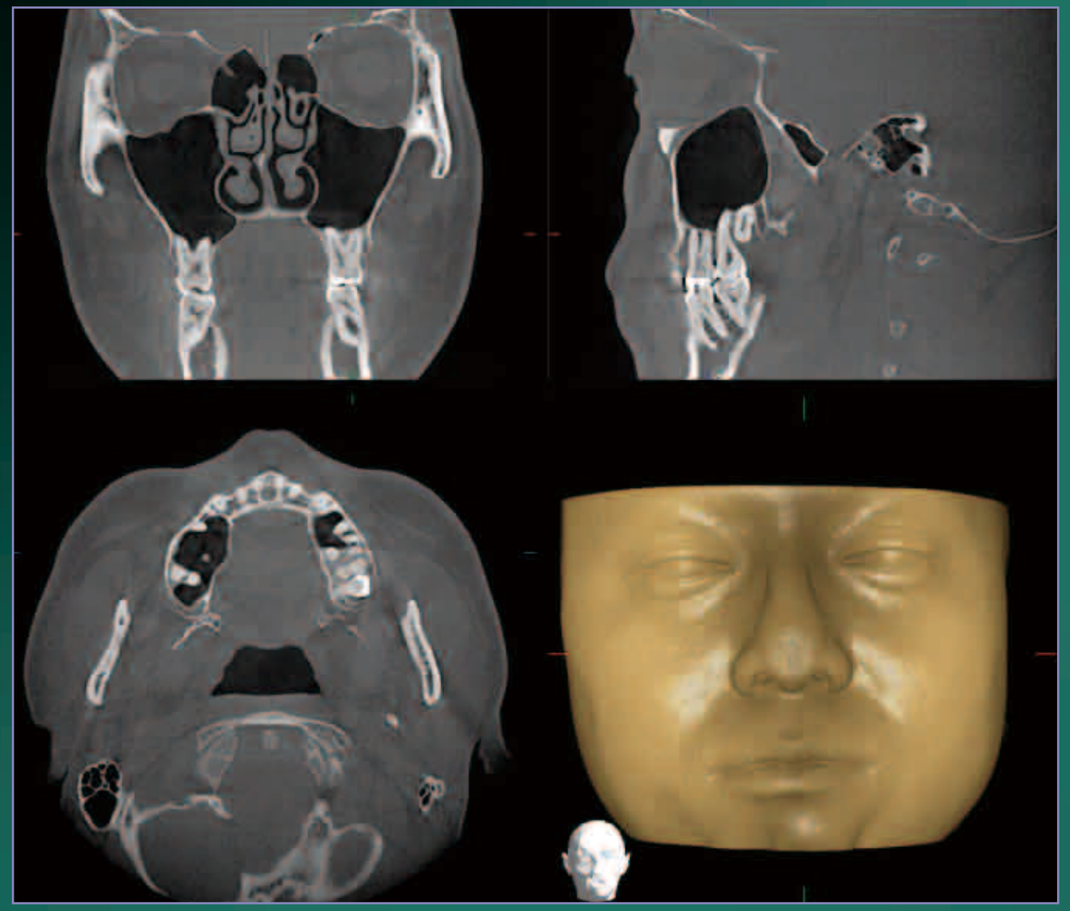


Lamina Cribrosa

HIGH RESOLUTION EVEN FOR WIDE AREAS

HIGH DEFINITION IMAGES

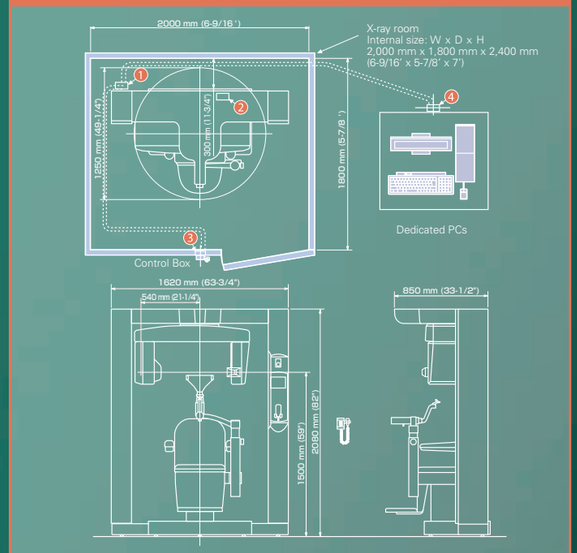
with a size of 170 mm (diameter) x 120 mm (height) enables comprehensive examination and visualization of the entire facial and maxillofacial and mandibular regions.



*ϕ*170 X H120 mm, Voxel size : 250 µm (90 kV, 6 mA)

TECHNICAL SPECIFICATIONS

Dimensions



1. Outlet of computer cable and operation cable
2. Outlet of power supply
3. Outlet of operation cable
4. Outlet of computer cable

Images provided by Fukushima Medical University
Technical Assistance: NUBIC (Nihon University Business, Research, and Intellectual Property Center)
Collaborative Development: J. Morita Corp. & Nihon University

Local distributor

Specifications

Trade Name		3D Accuitomo
		XYZ Slice View Tomograph
Model		MCT-1
Type		EX1/2 F17
Input Voltage		100/110/120VAC
		220/230/240VAC
Power Consumption		max. 2.0 kVA
X-ray Head		
	Tube Voltage	60 - 90 kV
	Tube Current	1-10 mA (Max 8mA : Hi-Fi, Hi-Res Modes)
	Focal Spot Size	0.5 mm
Exposure Time (360° / 180°)		Std Mode : 17.5 / 9.0 sec.
		Hi-Fi Mode : 30.8 / 15.8 sec.
		Hi-Res Mode : 30.8 / 15.8 sec.
		Hi-Speed Mode : 10.5 / 5.4 sec.
Field of View (Diameter × Height)		ø 170 X 120 mm　ø 170 X 50 mm ø 140 X 100 mm　ø 140 X 50 mm ø 100 X 100 mm　ø 100 X 50 mm ø 80 X 80 mm ø 60 X 60 mm ø 40 X 40 mm
Voxel Size		80 µm, 125 µm, 160 µm, 200 µm, 250 µm
Outer Dimensions		
	Main Unit (W x D x H)	1,620 mm × 1,250 mm × 2,080 mm (63-3/4" x 49-1/4" x 82")
	Control Box (W x D x H)	96 mm × 40 mm × 115 mm (3-3/4" x 1-5/8" x 4-1/2")
Weight		Approx. 400 kg. (882 lbs)

** X-ray protection should be provided for the patient when X-rays are emitted.*
** Design and specifications are subject to change without notification.*

Developed and Manufactured by
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