



FUJIFILM
Value from Innovation

Mammography Solution

AMULET Innovality

AMULET Harmony

AMULET Harmony incorporates a range of mammography solutions specifically designed to maintain a harmonious examination environment and foster an atmosphere of trust between mammographers and their patients.



Mood lighting to ease patient anxiety

Warm indirect lighting is used to illuminate the exposure stand, helping patients to relax and allowing examinations to be performed with minimal stress.

Decorative labels adaptable to each room environment

Five different stand labels are available to add a gentle ambience. Each site can choose a stand appearance that best suits the examination environment, thus relieving patient stress and anxiety.



Compression Paddles

Fujifilm Innovality features a wide lineup of compression paddles, in order to guarantee the best patient and breast positioning in all conditions. Special sizes and shapes are available as well as the default formats 18x24 and 24x30.



Fit Sweet Paddles

This type of compression paddle (available in 18x24 and 24x30 format) fits to the shape of the breast, allowing pressure to be evenly applied while holding the breast securely and ensuring the breast tissue is adequately separated. Models with the lateral shift function (see below) are also available in the lineup.



Shift Compression Paddles

This small compression paddle (18x24) can be positioned in the middle, right or left side of the detector at any time of examination according to the positioning of the patient.



AMULET Innovality

FUJIFILM DIGITAL MAMMOGRAPHY SYSTEM



FROM TECHNOLOGY INTO INNOVATION. FROM INNOVATION INTO CARE

FUJIFILM

FUJIFILM Corporation
26-30, NISHIAZABU 2-CHOME, MINATO-KU, TOKYO 106-8620, JAPAN
<http://www.fujifilm.com/products/medical/>





Lasting smiles for women worldwide

Innovation and quality in mammography

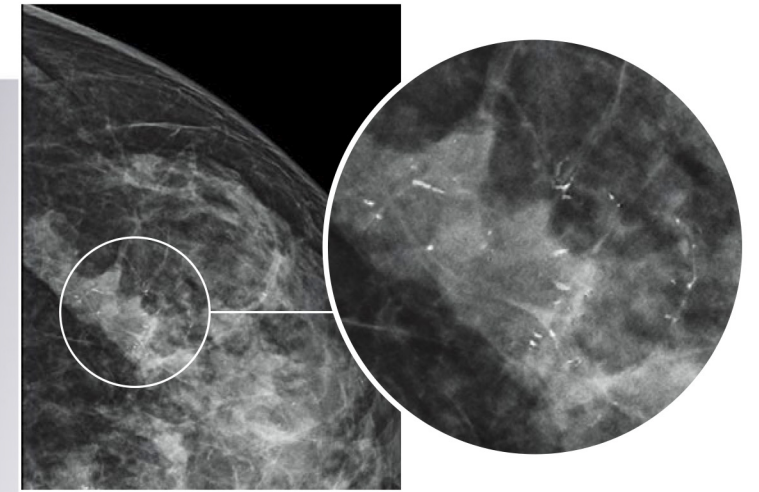


AMULET Innovality—the result of Fujifilm’s ongoing “innovation” and commitment to providing top “quality” mammography services. The Innovality utilizes Fujifilm’s unique a-Se direct conversion flat panel detector (FPD)* to produce clear images with a low X-ray dose. This system makes use of intelligent AEC (i-AEC) combined with a new image analysis technology to automatically optimize the X-ray dosage for each breast type. AMULET Innovality is a highly advanced mammography system which offers an extremely fast image interval of just 15 seconds. With this system, Fujifilm furthers the provision of high quality examinations with superior image diagnostic accuracy.

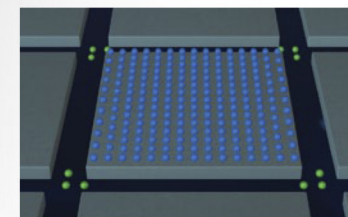
*Using a HCP (Hexagonal Close Pattern) TFT array.

Origin of the name: Origin of the name: With its mammography solutions Fujifilm hopes to be an “Amulet” — always there to protect women’s health and allow them to be true to themselves, vibrant and beautiful. The AMULET series aims to provide top-class digital mammography solutions that can be customised to meet every sites needs.

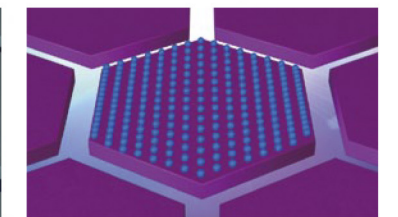
Unique detector for fast, low dose examinations



AMULET Innovality employs a direct-conversion flat panel detector made of Amorphous Selenium (a-Se) which exhibits excellent conversion efficiency in the mammographic X-ray spectrum. The new HCP (Hexagonal Close Pattern) detector efficiently collects electrical signals converted from X-rays to realize both high resolution and low noise. This unique design makes it possible to realize a higher DQE (Detective Quantum Efficiency) than with the square pixel array of conventional TFT panels. With the information collected by the HCP detector, AMULET Innovality creates high definition images with a pixel size of 50 µm; the finest available with a direct-conversion detector.



Conventional square pixel



AMULET Innovality hexagonal pixel

This low-noise and high-speed switching technology allows tomosynthesis exposures with a low X-ray dosage and short acquisition time to be performed. Fast image display is also possible, realizing a smooth mammography workflow from exposure to image display.

ISC – Optimized contrast and low X-ray dose using a Tungsten Target

Image-based Spectrum Conversion* (ISC) technology can be used to optimize contrast in an image. ISC analyzes images to compensate for variations in contrast due to the density of mammary glands, amount of fat and X-ray spectrum. ISC aims to ensure that images display adequate contrast even with the use of a high energy, low-dose X-ray beam. This technology allows sites that previously exploited the superior contrast of a Molybdenum target to realize the dose advantages offered by the use of Tungsten without having to compromise image contrast.

*Based on Image analysis the appearance is adjusted to emulate the image quality with the simulated “optimal” spectrum.



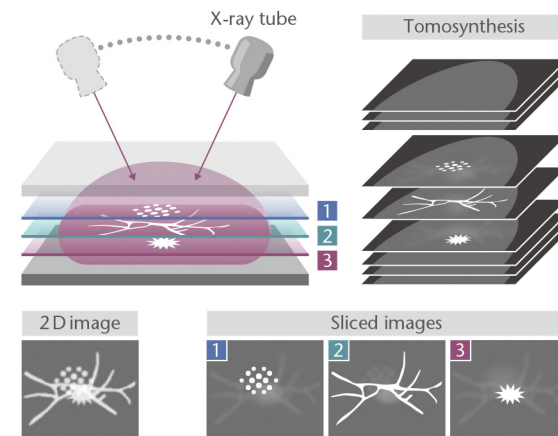
High quality images for easier diagnosis

Tomosynthesis: making it possible to observe the internal structure of the breast

In breast tomosynthesis, the X-ray tube moves through an arc while acquiring a series of low-dose X-ray images. The images taken from different angles are reconstructed into a range of Tomosynthesis slices where the structure of interest is always in focus.

The reconstructed tomographic images make it easier to identify lesions which might be difficult to visualize in routine mammography because of the presence of overlapping breast structures.

The Tomosynthesis function on AMULET Innovality is suitable for a wide range of uses, offering two modes to cater for various clinical scenarios. Standard (ST) mode combines rapid exposure timing and efficient workflow with a low X-ray dose while High Resolution (HR) mode makes it possible to produce images with an even higher level of detail, allowing the region of interest to be brought into clearer focus.

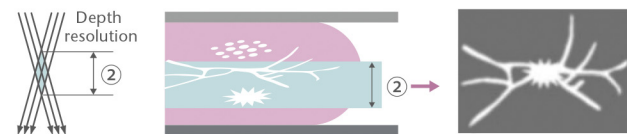


Breast screening and diagnostic mammography: two modes to answer different clinical needs

Routine mammography and breast screening: ST mode

- Acquisition angle: $\pm 7.5^\circ$
- Pixel size: 100/150 μm

The smaller angular range and fast image acquisition allow Tomosynthesis scans to be quickly performed with a relatively low X-ray dose.



Diagnostic mammography: HR mode

- Acquisition angle: $\pm 20^\circ$
- Pixel size: 100/50 μm

With a larger acquisition angle the depth resolution is improved. This allows the region of interest to be defined more clearly and brought into clearer focus.



Two types of image processing pattern

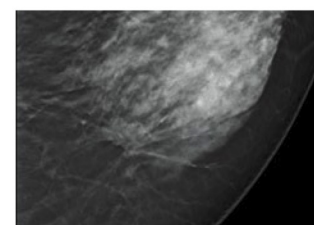


Image Processing Pattern 1

Enhances spicula and calcifications while keeping maximum contrast for the viewing of masses within the glandular tissue.

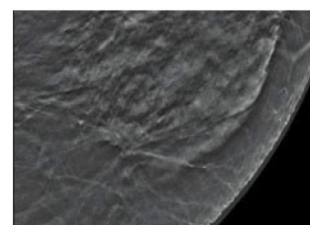


Image Processing Pattern 2

Maximizes the visualization of fine spiculations and calcification.



ISR – Iterative Super-Resolution Reconstruction

Excellent-m 3D

The tomosynthesis iterative super-resolution reconstruction (ISR) method has been specifically designed to support routine and screening application of ST-mode (15° angle) tomosynthesis acquisition.

1. Reducing graininess of image in low-dose tomography

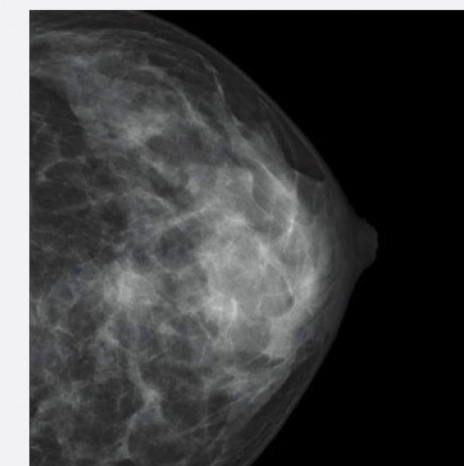
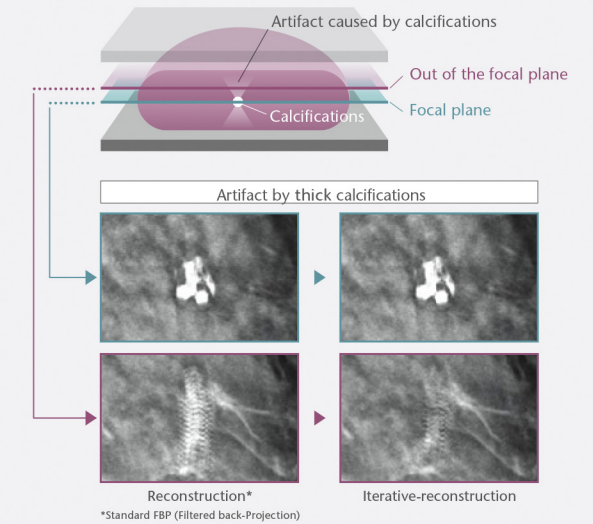
Each image is being processed to selectively suppress the patterns that do not exist in human body architectures (as the graininess related to noise), to reduce distracting details in the event of low-dose acquisition.

2. Suppressing interference of human body architectures at different depths

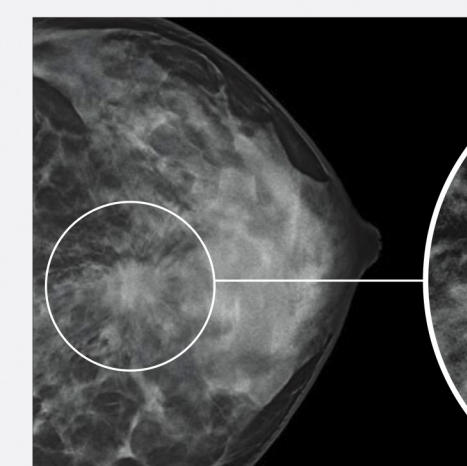
In the process of reconstructing the breast structure from multiple 2D images, details as calcifications, masses, spiculas, mammary gland and other signals that emerge from different depths are removed to reproduce the correct structures at the focus depth with greater fidelity and accuracy.

3. Restoring the fine-structure

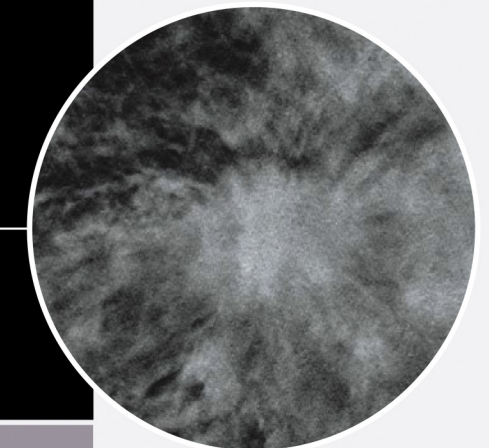
Our super-resolution technology is introduced to restore the fine-structure of microcalcifications and other details, the visibility of which might be impaired by the movement of the X-ray tube.



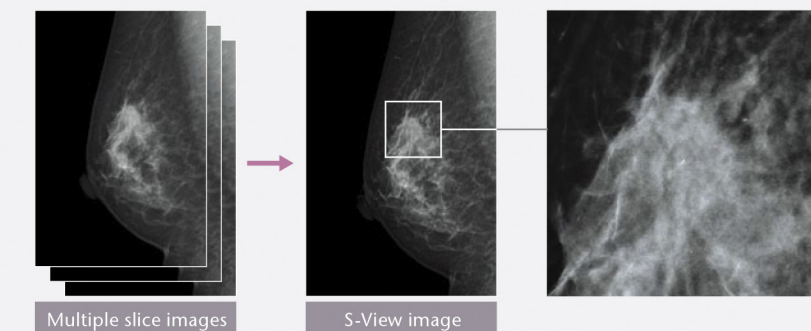
2D mammography image



Excellent-m 3D



S-View function for synthesized 2D images reconstruction



S-View function allows reconstruction of synthesized 2D images from the tomosynthesis acquisition data: both 2D and 3D images are provided for a more comprehensive interpretation.

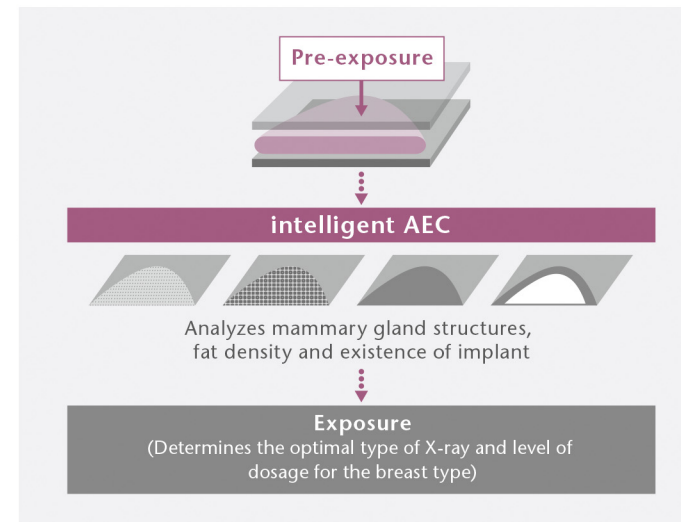
Easy operation and patient comfort

Intelligent AEC optimizes the X-ray dose for each breast type

Intelligent AEC has advantages in defining the optimal dose for an examination compared to conventional AEC systems where the sensor position is fixed.

Through the analysis of information obtained from low-dose preshot images, Intelligent AEC makes it possible to consider the mammary gland density (breast type) when defining the x-ray energy and level of dose required.

Able to be used even in the presence of implants; intelligent AEC enables more accurate calculation of exposure parameters than is possible with conventional AEC systems. By allowing the use of automatic exposure for the implanted breast, Intelligent AEC can further enhance examination workflow.



Patient information display

The information shown on the display **A** at the base of the exposure unit can be switched between patient information (ID, name, date of birth, etc.) and positioning information (angle of swivel arm, compression force and breast thickness). Positioning information can also be confirmed on the display **B** on the compression arm.



Dedicated mammography AWS (Acquisition Workstation)

Optimal examination workflow

- Integrated X-ray controller allows setting and confirmation of exposure conditions on a single screen.
- Examination screen can be split and switched between 1, 2, or 4 image display.
- Individual images can be immediately output to a PACS, viewer or printer during an examination.
- Density and contrast can be easily adjusted while viewing images.
- Alignment of left and right images can be adjusted both automatically and manually.

High definition second monitor (3M/5M: Optional)

- A second, high resolution monitor can be added to the AWS making it possible to display previous images recalled from a PACS to ensure the mammographer has access to previous images at all times.
- For Tomosynthesis, reconstructed images can be displayed.

Variable height operator desk

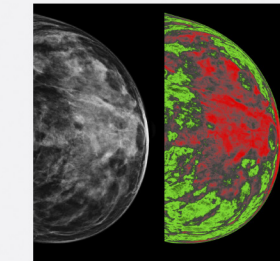
- A new desk has been designed to maximize operators comfort and system ergonomics, which is featured with an automated adjustable height mechanism: each user is able to operate in the best conditions and safety.



Other Unique Functions

Breast density detection and measurement

Fujifilm's unique technology allows an accurate detection of all breast components: fat and muscular tissues are recognized and their volume is analysed separately from glandular one. A proper measurement and classification of breast density can consequently be performed and provided with the images to improve exam interpretation and patient classification.



Density category, fat/glandular ratio, glandular dose and breast volume data are then embedded in each image DICOM header for proper information storage and utilization.

Mammography QC Program

Fujifilm's Mammography QC Program is a dedicated quality control program that can be used on all Fujifilm digital mammography systems. This program monitors system performance to ensure stable image quality is maintained for both screening and diagnosis.



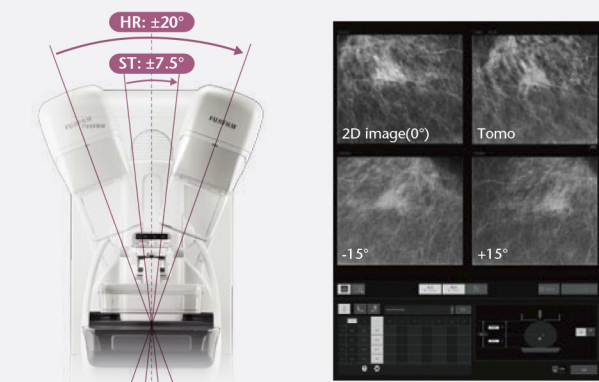
Stereotactic Biopsy Unit

The stereotactic biopsy unit allows accurate and reliable biopsy procedures to be performed using images featured with 20 pixel/mm spatial resolution: not even the most subtle detail is missed for the most accurate targeting.



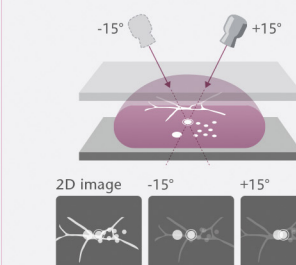
Tomosynthesis Biopsy

Targeting is supported using both tomosynthesis and stereoscopic images: the choice depends on operator confidence and lesion positioning. Tomosynthesis acquisition can be performed in both ST (Standard) and HR(High Resolution) modes, according to desired accuracy and lesion size.



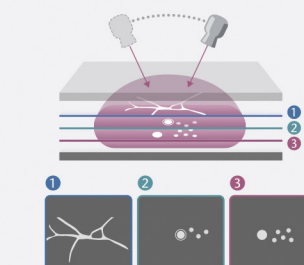
- Using a tomosynthesis image, it makes it possible to target the lesion which cannot be found on 2D image.
- Thanks to easier lesion position identification, tomosynthesis targeting results in a more efficient workflow and more simple operation.

Stereo imaging



- Overlapping breast structures make lesions less visible
- Difficult to identify a particular region

Tomosynthesis



- Reconstructed images show overlapping structures separately
- Easier to locate a target than with the conventional method

Needle lateral approach

Fujifilm's biopsy positioner allows multiple combination between gantry orientation and needle approach: thanks to a specific adapter the lesion can be reached either following a vertical and conventional orientation (perpendicular to detector) or with a lateral approach (parallel to detector).

