

HOW TO PICK YOUR MAMMOGRAPHY

- A guide to your next purchase

LBN Medical
A DirectMed Company

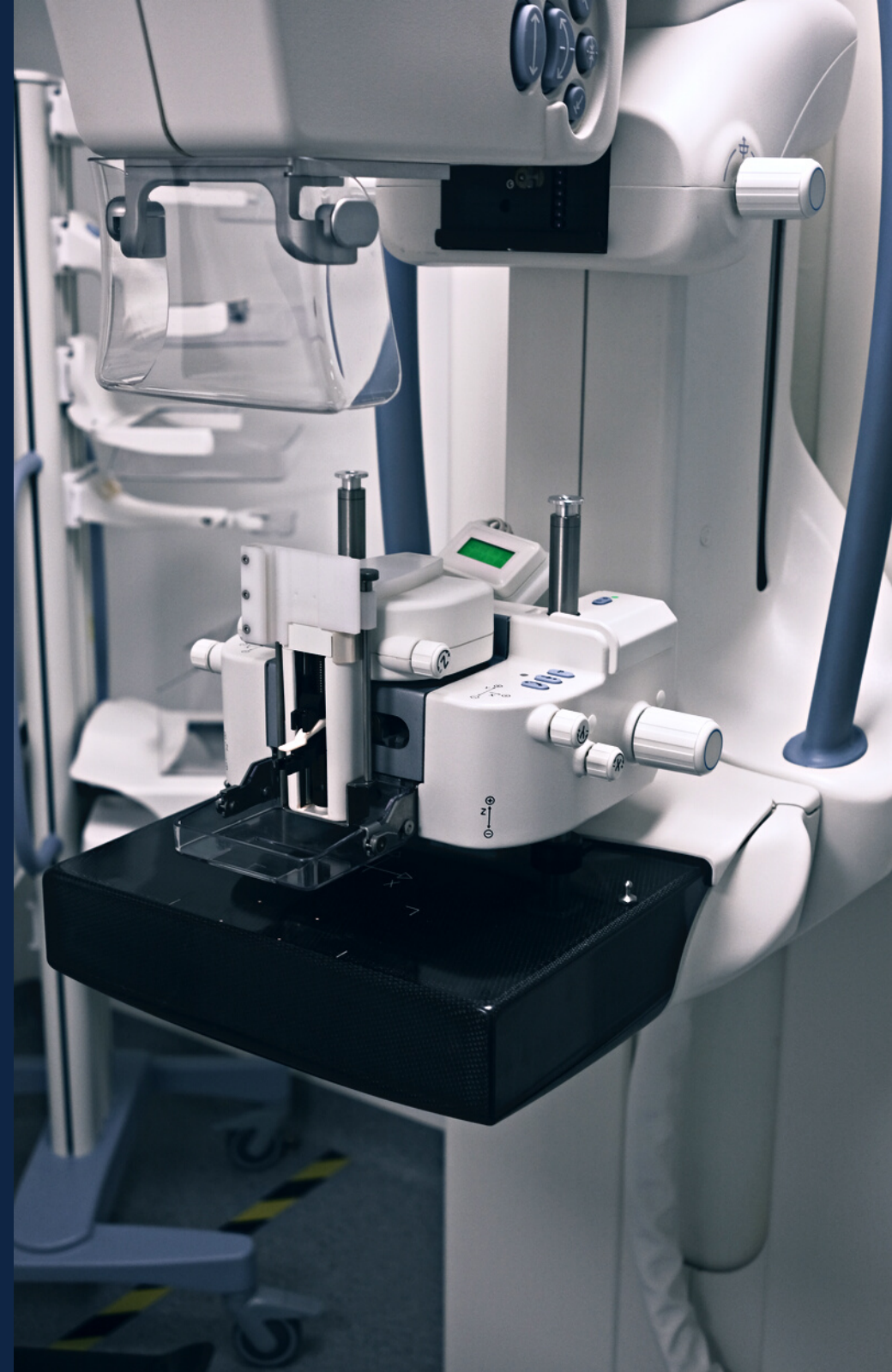


Table of Content

TOPICS TO BE COVERED

1. HOW TO PICK BRAND AND LINE	4
2. ANALOG AND DIGITAL MAMMOGRAPHY	8
3. WHEN DO I NEED 3D MAMMOGRAPHY?	10
4. HOW MUCH DO THEY COST?	12
5. EXTRA SPECIFICATIONS	13
6. MAINTENANCE AND INSTALLATION	14
7. WHICH SYSTEM TO BUY? (SUM-UP)	15

Mammography Guide Introduction

A mammography system is a specific type of X-ray equipment that is used exclusively for breast imaging. With relatively low doses of X-rays, they produce images - called mammograms.

Mammography continues to be the leading modality in the early detection of breast cancer. They are capable of detecting changes in breast tissues up to two years before it is palpable. Therefore, some countries offer screenings every 2 or 3 years for women from a certain age.

If you consider purchasing a mammography system, there are a few points that we recommend that you go through, each of which we will address in this e-book.

Note that although the points are general, we focus on the used market, as this is our main expertise.



How to Pick the Right Brand and Line of Mammography

The major players on the market of mammography are Fuji, Hologic, GE, and Siemens. Each of these manufacturers produce excellent models that provide high quality imaging.

This also makes them obvious choices for used systems, as the systems can maintain a great condition for many years.

The factors in choosing between the different high-end brands are limited. Really, it comes down to whether you have access to service in your region for each brand, and your personal preference.

When it comes to the lines of mammography, or series, within each brand you can see an overview below.



Fuji Mammography

Fuji is a popular choice among our customers, and mainly due to their Amulet series. This series contains several different models: The Amulet One, a 2D system, and the Amulet S and F.

The differences between these are that the Amulet S is the newer version, replacing the Amulet One. The F is slightly different as biopsy can be added as an extra option.

An even newer system is the Amulet Innovality, which is a tomosynthesis (3D) system. However, we rarely see this one in the used market as it was introduced in 2014.

Fuji do not have any analog systems available.

GE Mammography

GE has two main lines that are currently relevant.

The Senographe Essential and the Senographe Pristina. Each has a 2D model and a 3D model.

The Pristina are quite new on the market, therefore, our assessment is that it will be a while before these are available in the used market as well.

All of GEs systems have the capacity for biopsy, but it is an option not standard.

Analog GE models on the used market are the Senographe DMR and DMR Plus, and the Senographe 700 and 800.



GE Senographe Essential

Hologic Mammography

Hologic is another strong player in the market. Their main models are Selenia, which is a 2D mammography system, Dimension 2D, and Dimension 3D with tomosynthesis.

The Dimension 2D is the newer model that is replacing the Selenia and is still new on the used market.

Hologic also has biopsy as an option and can be added on both lines.

You can still see their analog models in the used market, for instance the Lorad M-IV, but they are now decreasing in popularity.

Philips Mammography

Philips also offer mammography systems, but we rarely have them at our facility.

But on the used market you could find the Sectra Microdose L30 and L50, and the newer MicroDose SI.

As first stated, brand is not the most important factor. In deciding between 2D and 3D models consider that 3D is better for advanced screening and early cancer detection.

2D is generally the choice if you are performing “regular” X-ray of the breast, for instance, to check palpable masses or to prepare for plastic surgery.

Siemens Mammography

Siemens has the Mammomat line that contains several models, all of which have the capacity to get the biopsy option.

The models include the Mammomat Fusion 2D, Mammomat Inspiration 2D and 3D, and also Mammomat Inspiration PRIME 2D and 3D.

The Fusion is their entry level system, while Prime is the newest model that came on the market in 2013. It uses lower radiation doses than the previous models.

On the used market you will also see analog systems such as the Mammomat Nova 1000 and 3000.



Siemens Mammomat Inspiration

When it comes to the lines of mammography within each brand, it can get a bit confusing. To get a better overview of what each brand offers, see the table below.

Mammography Systems

Brands and Model Examples

	Analog	Digital	Digital with Tomosynthesis
Fuji	-	Amulet One, Amulet S and F	Amulet Innovality
Hologic	Lorad M-IV	Selenia, Dimension 2D	Dimension 3D
GE	Senographe DMR and DMR Plus, Senographe 700 and 800	Senographe Essential 2D	Senographe Essential 3D
Siemens	Mammomat Nova 1000 and 3000	Mammomat Fusion 2D, Mammomat Inspiration 2D, Mammomat Inspiration PRIME 2D	Mammomat Inspiration 3D, Mammomat Inspiration PRIME 3D

Analog and Digital Mammography Machines



Advantages and Disadvantages

The next factor we will discuss is analog and digital mammography systems.

Digital mammography is now the main choice and, in this section, we will focus on it, but also offer a brief overview of the analog systems.

Main Differences

Analog mammography captures the X-ray beams on film cassettes. That creates an image on film that can be examined on a viewing board or turned into a digital image with a CR reader.

As opposed to this, a digital mammograph captures the X-ray on a digital detector which creates the digital mammogram. This allows the images to be analysed on specialized high-resolution monitors.

This also allows for easy use of digital tools in the analysis.

However, they can also be printed if needed.

Digital Mammography Systems

Digital systems are a bit more expensive than analog systems. But also more popular and perform better. They are therefore taking over the market more and more, and we do mostly recommend digital.

The main advantages are listed here:

Digital Mammography

More efficient workflow as the images are available immediately on the computer

Instant display of images allows for repositioning of patients and fewer retakes

On average, radiation dose is 30% lower than for analog systems

Easy access to new and used parts

Analog Mammography Systems

As analog systems are slowly disappearing from the market, we recommend digital.

However, analog systems are cheaper and are still preferred by a few of our customers. And as they do not have a digital detector, they can be cheaper to repair as well.

Their main disadvantages are:

Analog Mammography

Analog images can be less consistent due to the imaging process

As they take images on film, you need a CR reader to convert to digital images

Due to decrease in sales, finding parts for repairs can become challenging in the future

In conclusion, we do as a standard recommend digital systems, but in some cases, analog is also a good choice, mostly in case of budget constraints.

If you want a more in-depth overview of the advantages and disadvantages of each type, we would recommend our dedicated [article on this subject](#).



When Do I Need **3D** Mammography?

3D mammography or tomosynthesis, as it is also called, is still increasing in popularity.

In this section we will discuss the main pros and cons of tomosynthesis and in what cases it is really worth the investment.

Systems with tomosynthesis obtain 3D images by taking multiple mammograms from different angles, similarly to a CT scanner, which is then reconstructed into a 3D image of the breast. This allows for increased visibility of small changes of the tissues which enhance diagnostic capabilities.

In opposition to this, a normal mammogram consists of one image from one angle.

Main **advantages** of 3D mammography

3D Mammography

Provide better image quality

Earlier detection of tissue changes

Overcomes limitations such as tissue overlap and hereby decreases false positives

Furthermore, they can detect microcalcifications in the breast tissue, which can be a precursor for cancer.

So, are there really any disadvantages of the 3D mammography?

It is limited.

However, 3D images require higher doses of radiation than a standard 2D image. This is of course still minimal and well within doses that FDA approved for mammograms.

Furthermore, both acquisition and maintenance costs are higher for systems with tomosynthesis.

So, 3D mammography is an excellent system when you are doing cancer screening and early detection of cancer.

If you would like a more thorough article on tomosynthesis we recommend [this article](#).



How Much Does a Mammography Machine **Cost?**

This section will focus on our most asked question:

“What is the price?”

And the short answer is – it depends. On year of manufacture, model, condition, specifications.

However, we will share some general price brackets. The prices cover used systems, excluding accessories.

Below you can see an overview, based on the three categories: Analog, digital, and digital with tomosynthesis. All of which you learnt about in the previous chapters.

In the table, prices are in euros and are for the systems only. This means that workstations and other accessories are not included.

Furthermore, you need to top off the numbers with costs for crating, shipping, warranty, installation etc.

And remember, if you buy an analog model, you also need a CR if you want to convert to digital images.

	Analog	Digital	Digital with Tomosynthesis
Price (in euros)	8.000 - 15.000	20.000 - 50.000	50.000 +

Note for digital systems: The digital detector is expensive, therefore, its condition has a great impact on the price of the system.

Extra Specifications

Now you have been presented with different options regarding brand, model, type, and price.

But there is more - For instance, workstations.

A workstation is the computer that allows you to analyse the mammograms independently of the system and the operative console.

It is doable to analyse images on the operating console. We have customers who do so. However, only customers that are not actively performing cancer screening. So overall, we recommend that you acquire a workstation.

As the workstations work on DICOM, the brand of the workstations does not have to match the brand of the system.

Same goes for printers - they also operate on DICOM, thus, you can use any brand for the mammography of your choice. However, not all printers can do proper mammogram printing in adequate resolution, so this is important to be aware of.

As mammograms need to be of very high quality to detect the small changes in the tissue, it is necessary to have monitors with excellent definition. Furthermore, you need dual monitors, as a standard examination can provide up to 6 images.

A monitor is usually 5 mega pixel (mp). Some of our customers are fine using 3 mp, but we do recommend 5 mp or more, to meet the standard of 50 micron per pixel.



Maintenance and Installation

If you want to install and take care of your mammography system yourself, we will now share some general tips.

These are general – but each model is different. We recommend that you consult the manuals for model specific information.

Do's

Detach and ship the detector in a thermo box, as it is very sensitive to low and rapid changes in temperatures, and shocks.

Keep a service backup from before deinstallation or before/after any system configuration.

Keep the software CDs and especially the detector CD. You may need detector CDs for a full calibration in case of software issues.

Use a trained technician to install or deinstall your system. Small mistakes might turn into issues.

Don'ts

Do not touch or push the detector surface, as it may cause unrecoverable damage.

Do not change the IP of the mammography components without a trained technician. Normally, there is a second LAN port in acquisition workstation which can be configured for hospital connection.

Do not use detergents to clean the carbon cover and detector surfaces. Consult with service manual for cleaning instructions.

Do not use the mammography system if you have unstable power and no UPS.

Main Points

Sum Up

So, are you on top of the main factors that help you decide on the system that is just right? Let's do a quick sum up:

Which brand is better?

The major OEMs is what we know of, and we know them for excellent quality. In choosing between Fuji, Hologic, Siemens, and GE, your main indicator is the service provider you have access to in your specific area.



Should I buy analog or digital?

The analogs were very stable systems that can be cheaper in maintenance costs. However, the digital systems are taking over the market and are the future of mammography. If you have the budget for it, we recommend digital.

Should I get a 3D or not?

Tomosynthesis gives you the option of capturing your images in 3D rather than 2D.

This improves visibility of tiny abnormalities and is particularly relevant for early cancer detection and screening.

How much does a mammography cost?

Generally, the analog ones are slightly cheaper and can be found for around 11.000 euros.

Digital mammography systems are more expensive and are typically found in the range of 20 – 50.000 euros.

And if you want a system with tomosynthesis as well, you will most likely need to go above 60.000 euros.

What accessories do I need?

Often, our customers require a workstation and sometimes a printer. Useful for respectively increasing patient throughput and if you prefer to analyse or store the images in paper.

Should I buy used, refurbished or new?

This depends on your practice. For some, only the newest most cutting-edge options will do. Those should pick a new system.

However, most can have their needs covered with either a used or refurbished, which is also much cheaper than new.

The refurbished mammos come in a better condition than used, and can be offered with warranty as well. This again depends on your own preference and budget.

Sum up conclusion

There are many factors to consider, and the most important is that you get a system that covers your needs. Therefore, you should carefully consider both needs and your budget when deciding on a system.

Most professional providers will be able to find a good match if you have these above points covered.

Furthermore, they should be able to guide you in case you have doubts about certain aspects of the specifications.

If you have further questions, feel free to contact us.

You can email us at sales@lbnmedical.com
Or visit our website lbnmedical.com



"Hello, I want to thank you for everything you have done for our hospital to get a good mammography device. The picture quality is so good! The X-ray nurse writes that he now has the best mammography images in the region."

- Customer from Congo bought a used
GE Senographe Essential

