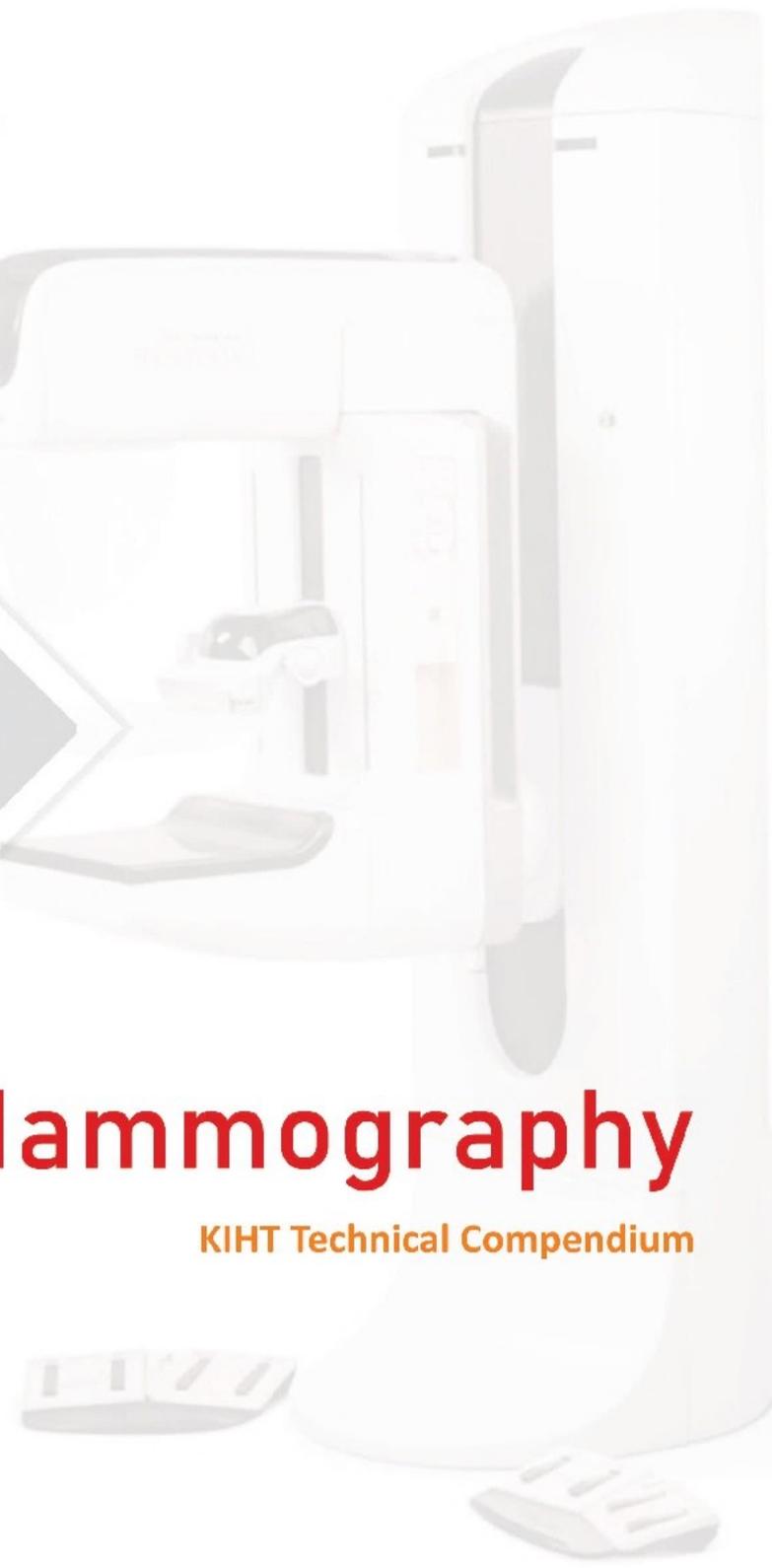




# Mammography

KIHT Technical Compendium



# MAMMOGRAPHY

## KIHT Technical Compendium

**Version 1.0**

**Acknowledgment:**

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## LIST OF ABBREVIATIONS

<b>Acronym</b>	<b>Expression</b>
$\mu\text{m}$	Micrometer
ACS	American cancer society
AD	Architecture distortion
AEC	Automatic exposure control
CAD	Computer-aided detection
CAGR	Compound annual growth rate
CC	Cranial-caudal
CCD	Charge-coupled device
CEDM	Contrast-enhanced digital mammography
CEUS	Contrast-enhanced ultrasound
CMOS	Complementary metal-oxide-semiconductor
CNR	Contrast to noise ratio
CR	Computed Radiography
CT	Computed tomography
CTLM	Computerized tomography laser mammography
DBT	Digital breast tomosynthesis
DCE-MRI	Dynamic contrast-enhanced-MRI
DOI	Diffuse optical imaging
DOT	Diffuse optical tomography
DQE	Detective quantum efficiency
DRL	Diagnostic reference level
Hb	Hemoglobin
HbO <sub>2</sub>	Oxy-hemoglobin
LM	Latero-medial view
ML	<i>Medio-lateral view</i>
MLO	Mediolateral-oblique
MoRh	Rhodium filter
MRI	Magnetic resonance imaging
PEM	Positron emission mammography
Sd	Standard deviation
SID	Source-to-image distances
SNR	Signal noise ratio
TDI	Time-delay integration
TFT	Thin-film-transistor

## EXECUTIVE SUMMARY

In women, most common cancer is breast cancer. It can occur in men also but the incidence of breast cancer in males is about 1% than in females. In 2018 alone, around 2.09 million women were diagnosed with breast cancer. It refers to the irregular growth and uncontrolled multiplication of cells in the breast tissue whose cause still remains unknown. This can occur either from duct line cells or from the cells within breast lobules. The breast cancer usually becomes malignant from the epithelial level and increases the proliferation of the epithelial cells. Cancer becomes irreversible if it progresses further and develops into carcinoma in situ. Earlier detection and diagnosis of breast cancer are crucial to improve survival rates and reduce the need for aggressive treatment such as mastectomy.

A mammogram gives an X-ray image of the breast. It is used to detect breast cancer even when women have no sign of it. It can also diagnose other breast problems like a lump, benign tumors, and cysts even before they have been identified by physical examination. Mammograms use ionizing radiation to create images, that usually use lower energy X-ray spectrum (20-38 kVp). During mammogram scanning, two views of each breast are taken that will result in a dose of about 0.4 mSv, which is more than bone radiography (0.1 mSv). Apart from the mammography, there are other adjunctive techniques which include breast ultrasound, ductography, positron emission mammography (PEM) and magnetic resonance imaging (MRI).

According to the report of 'Zion Market Research'<sup>1</sup>, the global mammography market size was valued at USD 1.68 billion in 2017 and is expected to generate revenue of around USD 2.69 billion by the end of 2023, growing at a CAGR of around 8.1% between 2017 and 2023. Whereas, the Asia-Pacific market is predicted to reach USD 456.33 million by 2023 from its current value of USD 320 million in 2018 with a significant CAGR of 7.3%. According to the American Cancer Society (ACS), breast cancer makes up 25% of all new cancer diagnoses in women globally. As highlighted above, in 2018, nearly 2.09 million new cases were diagnosed worldwide. Due to rising breast cancer cases and growing awareness pertaining to preventive check-up for breast cancer, the market is experiencing growth.

The increasing healthcare expenses, progressing healthcare industry, and arising need for regular monitoring are some of the factors expected to drive demand for mammography machine in the upcoming years. Also, improving government awareness and increasing initiatives are the considerable factors for the demand of mammary gland cancer screening systems over the forecast period.

The main objective of this product dossier is to cover the entire spectrum pertaining to a medical device called a mammography machine. This dossier explains the clinical aspects, requirements, and principles to understand the need and working of the equipment. The detailed technical aspects will enlighten the readers on the criticality of the product at the component level and provide a glimpse of relevant standards and patents etc.

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<sup>1</sup> Global Mammography Systems Market will Reach USD 2.69 Billion by 2023: Zion Market Research

## **ABOUT:**

Andhra Pradesh MedTech Zone (AMTZ) is an enterprise under the Government of Andhra Pradesh, a 270 Acre zone dedicated for medical device manufacturing with 200-250 manufacturing units. AMTZ provides the one-stop solution for all the manufacturers by providing, common scientific testing facilities (EMI/EMC, Electrical Safety, Radiation, Biomaterials Testing, 3D printing facilities), commercial facilities such as expo halls and warehouse.

Kalam Institute of Health Technology (KIHT) in the premises of AMTZ facilitates focused research on critical components pertaining to medical devices, technology transfer of innovative technologies through e-auction, market innovation, and access. These end to end solutions help to reduce the cost of manufacturing up to 40% and make health care products more affordable and accessible.

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