

*e-beam pioneer*

# Company Introduction

X-RAY · LINAC · TABLETOP SEM

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E-beam Technology-Based System Commercialization Company

SEC Co., Ltd.

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- 2 Key Competitiveness
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- 1 Finance Status by year
- 2 Approx. Profit & Income Statement
- 3 Business Plan





# “ Possess World Unique X-ray Tube, LINAC, SEM Original Tech and Commercialization Company ”

## Overview



Name SEC Co.,Ltd.

CEO Jonghyun Kim

Foundation Date Corporate Conversion : Mar, 2000  
(Founded :Mar, 1991)

Address 111, Saneop-ro 155beon-gil,  
Gwonseon-gu, Suwon-si,  
Gyeonggi-do, Republic of Korea

Employee 226 Employees (Oct. 2024)

Web Page [www.seceng.co.kr](http://www.seceng.co.kr)

Total Asset 72.7Bilion Won ( 2Q, 2024)

## Business Field



### 1 Industrial X-ray Inspection Equipment

- Developed and internalized X-ray tube for the first time in Korea
- In-line/Off-line X-ray inspection system
- Inspection for Semiconductor, Electronic parts, and Batteries, etc.



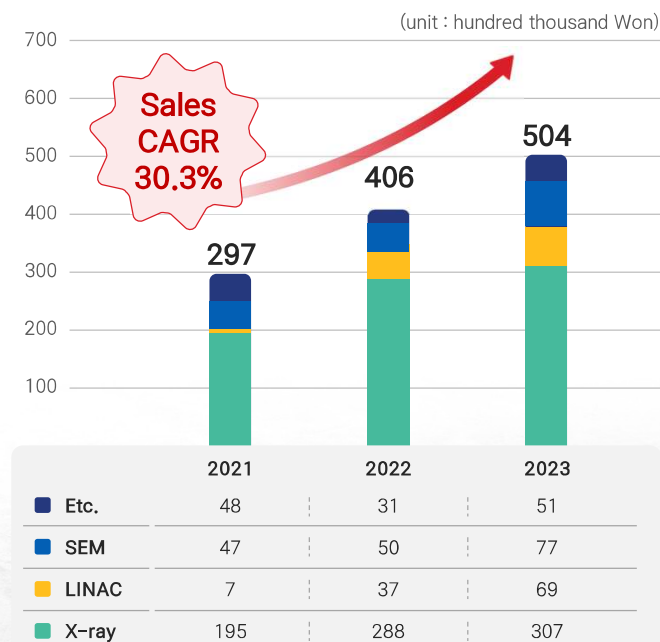
### 2 LINAC; Linear Accelerator

- 1~15MeV level Linear Accelerator
- Large Structure Inspection Equipment ex) Defense Industry NDT
- Security Container Inspection System(CIS)



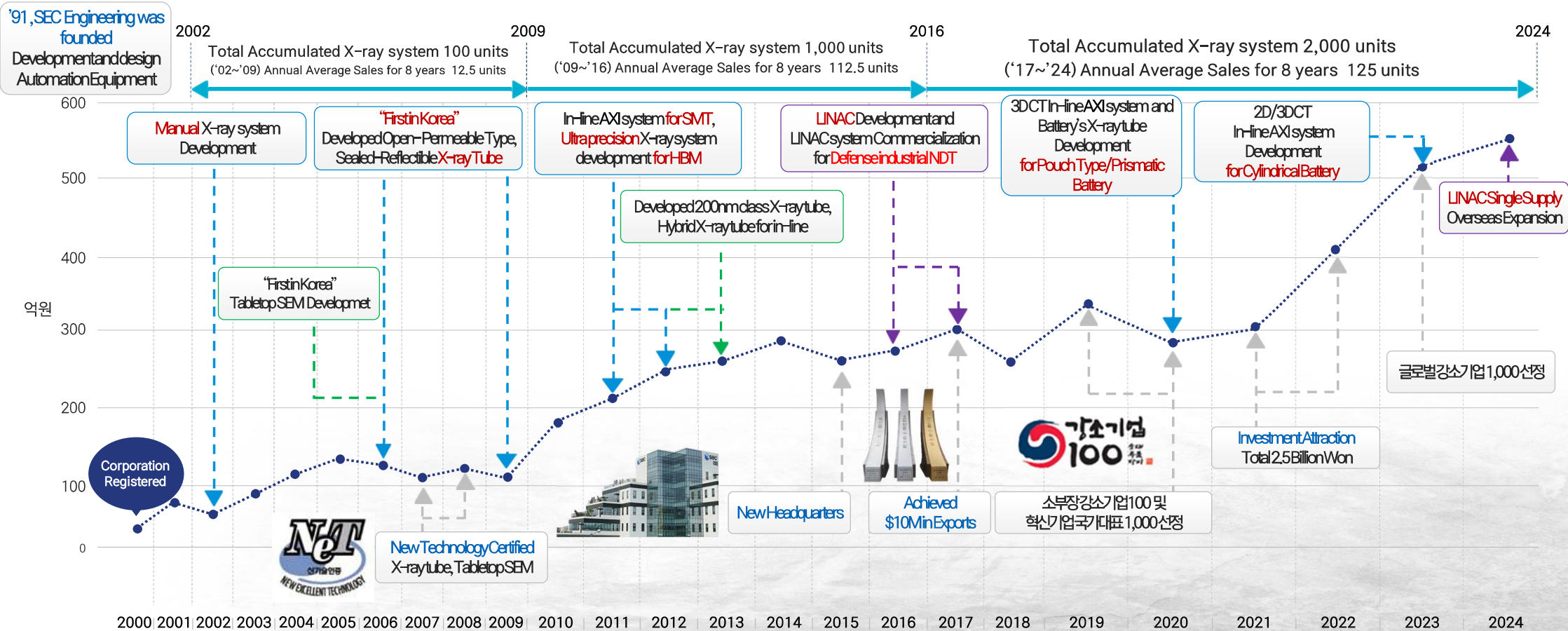
### 3 Scanning Electron Microscope (SEM)

- Developed and internalized Tabletop SEM for the first time in Korea
- Used in R&D and quality management in new materials, bio, nano, etc.



## “Constant Development and Commercialization for 33 years”

Successful domestic development and commercialization for **E-Beam applied components and equipment**















## Key Talents Driving Sustainable Growth beyond technological limits with innovation and strategic insights



### Management Team Harmonizing Technical Expertise and Business Capabilities

 <b>Jonghyun Kim</b> <small>Founder</small> <b>CEO, Board Member</b>	 <b>Euldoo Shim</b> <small>Chief Operation Officer</small> <b>COO</b>	 <b>Youngman Kim</b> <small>Chief Technology Officer</small> <b>CTO, Board Member</b>	 <b>Janggeun LEE</b> <small>Chief Financial Officer</small> <b>CFO, Board Member</b>	 <b>Manseok Kim</b> <small>Chief Product Officer</small> <b>CPO</b>	 <b>Uijo Hwang</b> <small>Chief Marketing Officer</small> <b>CMO</b>	 <b>Wonhyuk Jeong</b> <small>Independent Director</small> <b>Independent Director</b>
Years at SEC   24 yrs (33)	Years at SEC   2 yrs	Years at SEC   24 yrs	Years at SEC   24 yrs	Years at SEC   20 yrs	Years at SEC   5 yrs	
Business Career   43 yrs	Business Career   22 yrs	Business Career   35 yrs	Business Career   25 yrs	Business Career   29 yrs	Business Career   19 yrs	Business Career   20 yrs

### Research · Manufacturing · Marketing · Management Core Manpower

 <b>Jonghee Kim</b> <small>2<sup>nd</sup> Research Institute Director</small> <b>2<sup>nd</sup> Research Institute Director</b>	 <b>Sangcheol Kim</b> <small>3<sup>rd</sup> Research Institute Director</small> <b>3<sup>rd</sup> Research Institute Director</b>	 <b>Gicheol Go</b> <small>1<sup>st</sup> Sales Team Director</small> <b>1<sup>st</sup> Sales Team Director</b>	 <b>Junho An</b> <small>Product Management Director</small> <b>Product Management Director</b>
Years at SEC   7 yrs	Years at SEC   3 yrs	Years at SEC   23yrs (28)	Years at SEC   24 yrs(30)
Business Career   14 yrs	Business Career   11 yrs		

\* SEC Engineering + SEC Co.,Ltd. Career in ( )

## 5 Organizational Chart

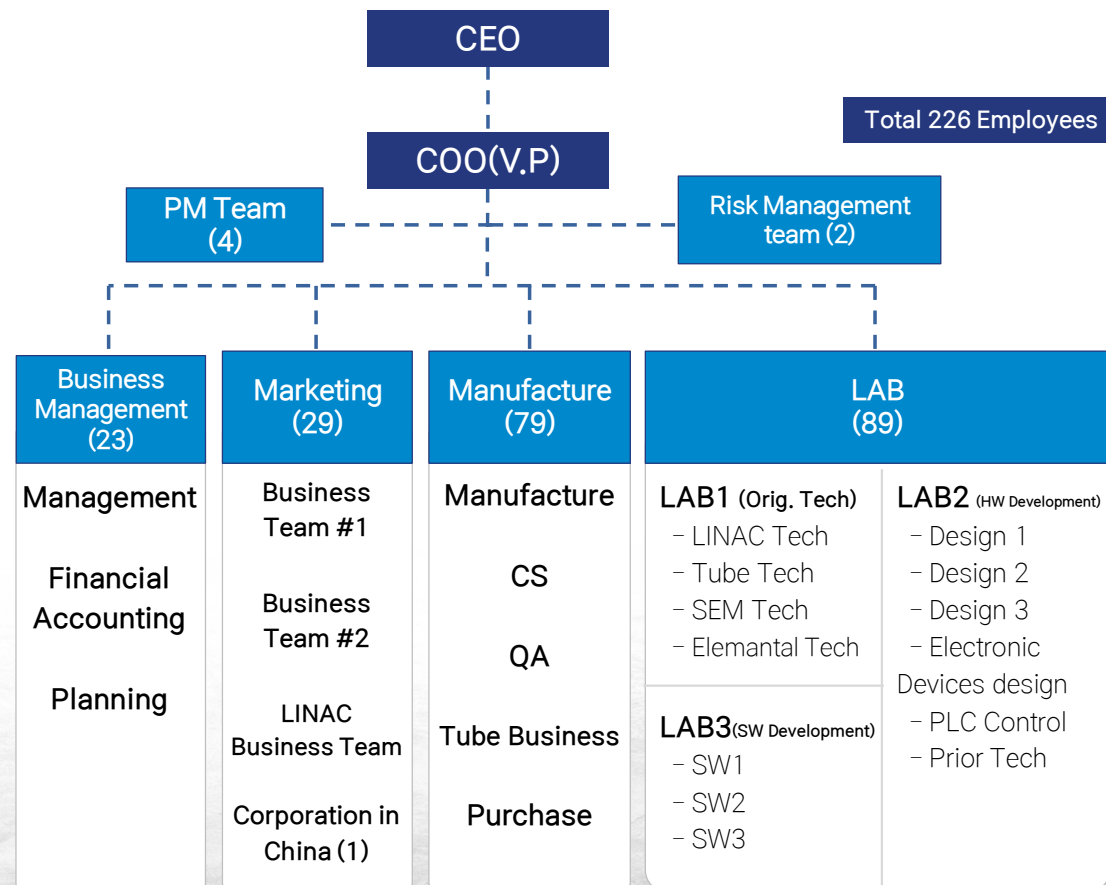
Departments		Work R&R
Business Management	Management	Management, HR, General Affairs, Safety and Health, Security, Data Process and etc.
	Financial Accounting	Accounting, Taxes, Funds, Assets
	Planning	Business Plan, Study Plan, IR
Marketing	Business team #1	X-ray system Business for Battery
	Business team #2	X-ray system for Semiconductor, Tabletop SEM, etc Equipment Business
	LINAC Business Team	LINAC Sales , Manufacture and Set-up, CS(Customer Service)
	Business Support	Manage Business/Sales, Imports,exports Customs
	Corporation in China	Business in China and CS
Manufacture	Manufacture	Manufacturing X-ray system, Tabletop SEM
	CS	X-ray system, Tabletop SEM CS
	QA	QA / QC
	Tube Business	X-ray tube Manufacture
	Purchase	Purchase/Material Duty
LAB	LAB1	Original and Elemental Tech Development for LINAC, X-ray tube, SEM
	LAB2	Mechanism design for X-ray system, design/set-up for electronic devices and PLC control, plan inspection condition and review options
	LAB3	X-ray/LINAC/SEM SW Development, Deep Learning Study, SW CS
PM Team		Project Management (PO ~ SAT)
Risk Management		Identify, Evaluate, and encounter risks

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### IV . Finance Status & Business Plan



\* 2024년도 10월 31일 기준



“Expansion of The Inspection Tech Center and Manufacturing Facilities  
in response to the sales growth in semiconductor and battery divisions”

## Headquarters



- Total Area : 10,900㎡ (B1 ~ 7F)
- Capacity : X-ray for Semiconductor – 150units per year  
X-ray for Battery – 33units per year  
LINAC – 16units per year, SEM – 150units per year
- X-ray tube/LINAC/SEM development and manufacturing facilities
- High energy(15MeV) shielded bunker, Diamond Turning Machine(DTM)

111, Saneop-ro 155beongil, Gwonseon-gu, Suwon-si, Gyeonggi-do, Republic of Korea

## Factory 2



- Total Area : 1,322㎡ (1F)
- Capacity : Battery X-ray system – 48units per year
- Capacity expansion due to increased orders in the battery business

228-81, Saneop-ro 155beon-gil, Gwonseon-gu, Suwon-si

## Inspection Tech LAB



- Total Area : 134㎡ (1F)
- X-RAY Inspection Tech Research (Semiconductor, Battery, etc.)

Institute of Convergence Technology  
C102, Ochang-eup, Chungcheongbuk-do

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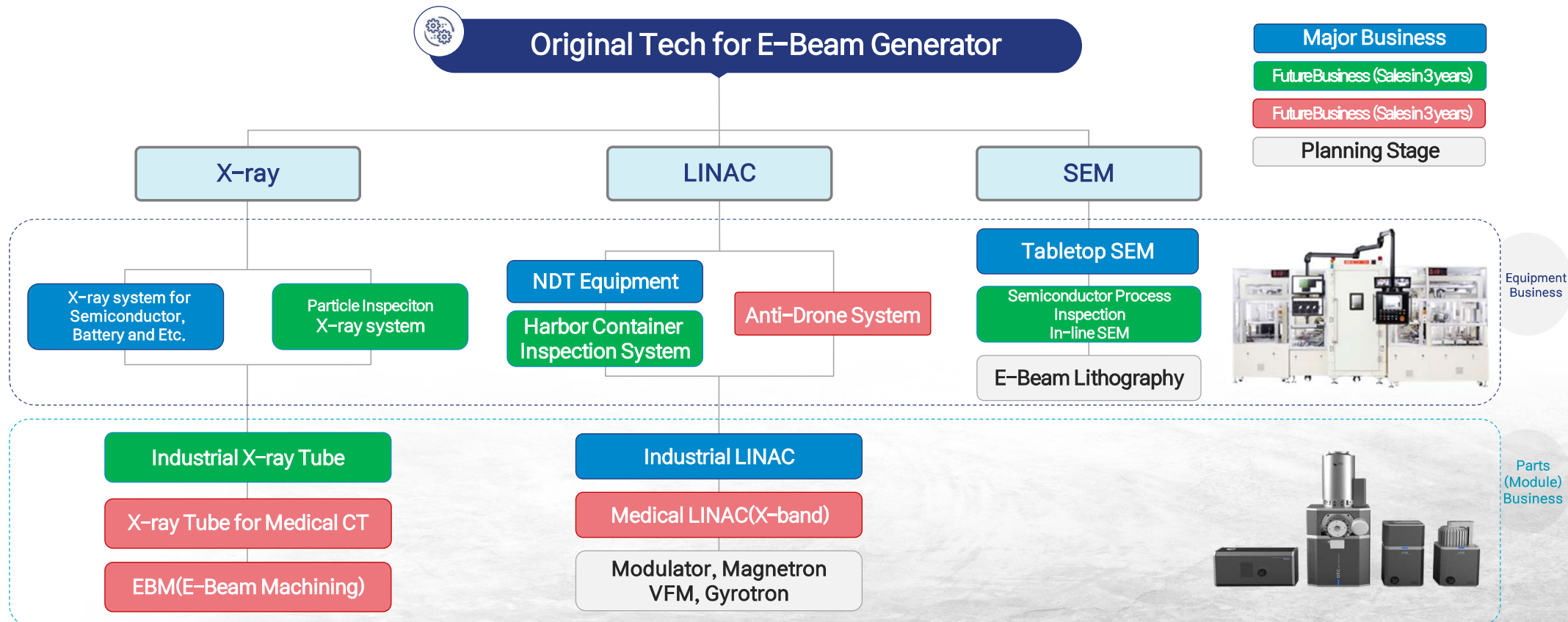
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Innovative Equipment Commercialization for **X-ray Tube, LINAC, Tabletop SEM**  
based on electron beam core technology



Future discovery, development, and business expansion  
in fields requiring E-Beam Technology



Generating Profits from Various Fields;  
materials, devices, inspections based on **E-Beam Technology**

X-ray tube · Linear Accelerator (Development and Manufacture internalization)



Large Structures, Components inspections

LINAC NDT  
(2017~)

Qty 8  
KRW 2.22B



· Military Etc.



E-Beam Business  
Based on Technology



· Bio Nano  
· Biology

· Material  
· Li ion Battery Etc.

University R&D Center Government Etc.

Material, Living Organism  
Inspection

Tabletop SEM  
(Scanning Electron Microscope) (2006~)

Qty 1,056  
KRW 6.6B

Industrial X-ray Inspection (2002~) ▶ Material, Components Inspection

Qty 1,989  
KRW 32.21B



· Semiconductor  
· SMT  
· ELECTRONIC  
· COMPONENTS  
· LI ION BATTERY Etc.



\* Based on sales from the year the firm was founded to the first half of 2024



## “Industrial(Battery, semiconductor) X-ray system”

### Overview

An X-ray system is a product that utilizes the physical properties of X-rays, penetrating objects to inspect the **internal structure and detect defects (e.g., voids, cracks) of the target**

### Application Range

Utilized in a variety of industries for internal defect inspection

BEV Battery	Semiconductor	PCB (Printed Circuit Board)	SMT (Surface Mount Technology)	HBM (TSV)	Cast
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### Background of Technological Development

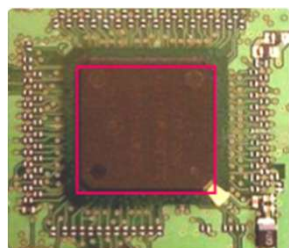
- It was difficult to identify internal defects due to limitation of optical inspection
- Industrial mass production and X-ray tech development started in the 1990s, and in Korea in the 2000s.

### Tech Development

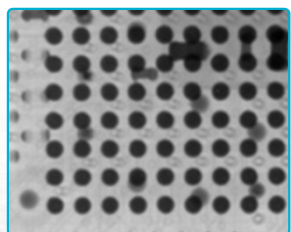
- The requirement for X-ray equipment is increased by BGA connections, multi-layer PCBs, and advancements in semiconductor stacking technologies.
- The AXI system, which would replace AOI, Started to be developed and advanced in the 2010s.

### Recent Trend

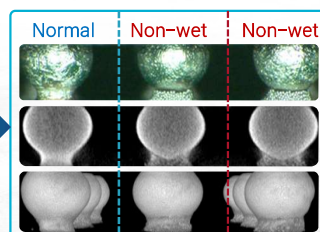
- Radical increase of X-ray Inspection system due to expansion of EV market
- The lack of 2D battery inspection standards and technology is driving the need for 3D precision inspection



Optical Inspection Image



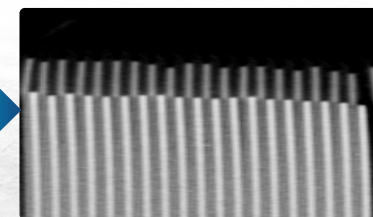
X-ray 2D Inspection Image



X-ray 3D Inspection Image



Battery 2D Align Inspection Image



Battery 3D Inspection Image

“The **revenue share** of the industrial X-ray business – **61%**, Major Core Business”

### Current Core Business

- **Pouch/Prismatic/cylindrical** 2D/3D In-line Inspection Equipment
- **HBM TSV** 2D/3D In-line Inspection Equipment
- **SMT Process** 2D/3D In-line Inspection Equipment
- Manual Inspection Equipment for Research/Analysis

### Business under Development and Commercialization

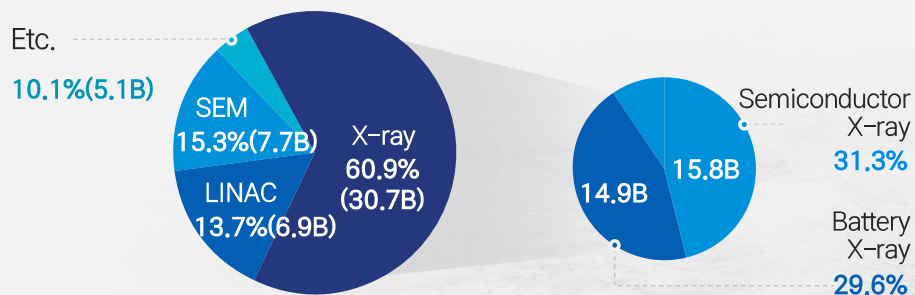
- **Through Glass Via (TGV)** In-line Inspection Equipment Development
- **Internal Battery Cell Particle** In-line Inspection Equipment Development
- **Battery Powder Material Particle** In-line Inspection Equipment Development
- HBM/SMT Existing Equipment Performance Improvement in Progress

### Derivative Business (Planning or early Development Stage)

- E-Beam Machining (Combined with SEM Technology)  
– TGV; Through Glass Via Process
- Medical CT X-ray tube Refurbishing Tech Development

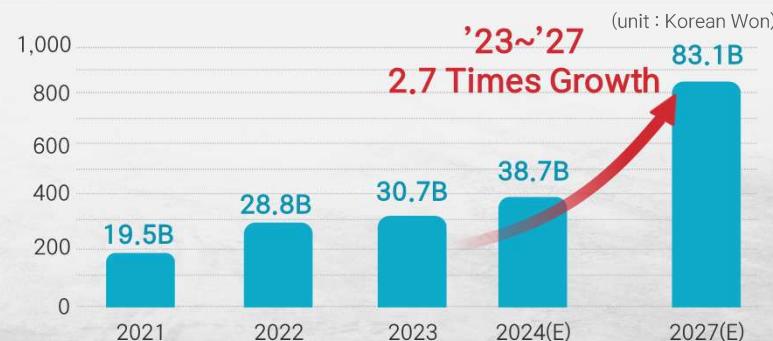
### 1 2023 Sales Share

(unit : KRW)



### 2 X-ray Sales Estimation (24.11.01 On Hand Orders 33.8B Won)

(unit : Korean Won)

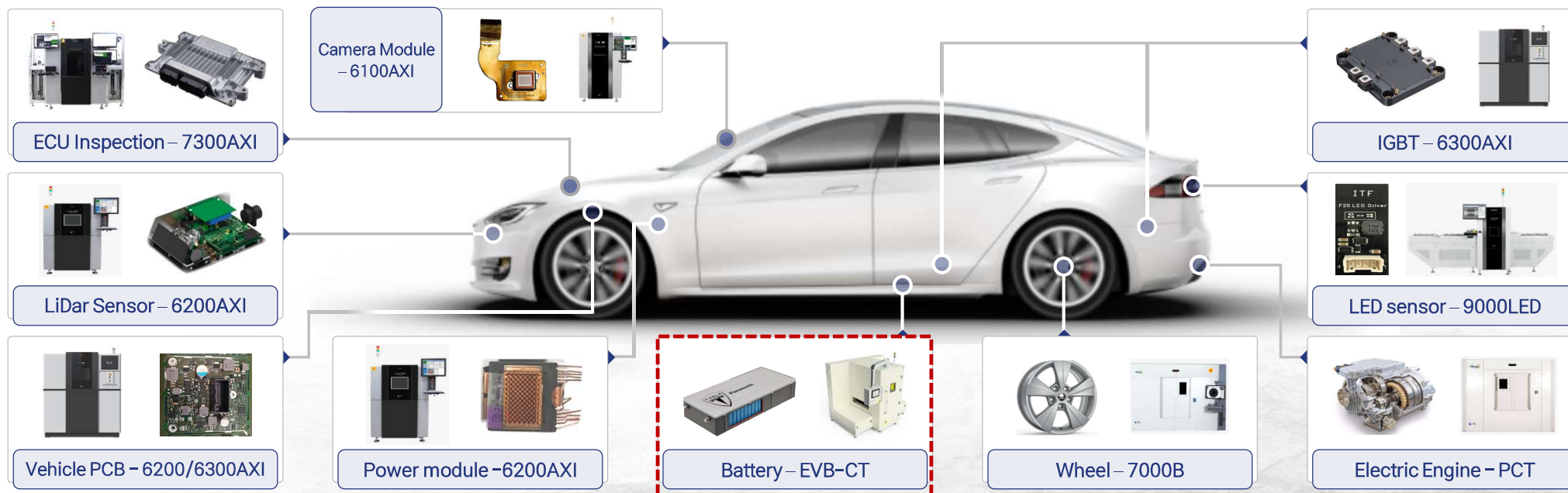




Demand and Supply Increase for Battery/Electronic Components due to BEV and Automated Vehicle Improvement,  
**expansion of Full X-ray Inspections**  
**(Preventing Safety Incidents, Sudden Acceleration and Battery Fire)**



Inspection Target for Automated and Electric Vehicles and our corresponding models





## 2 Major Product Introduction

I. Introduction

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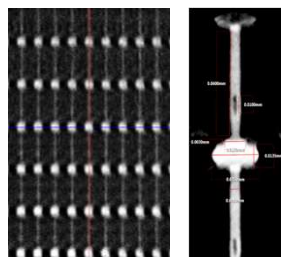
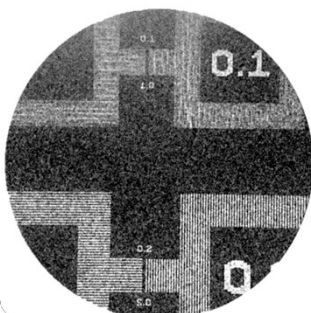
III. Investment Highlight

IV. Finance Status & Business Plan

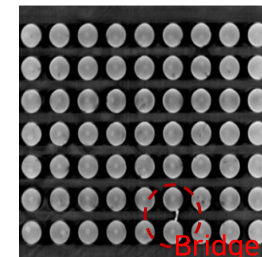
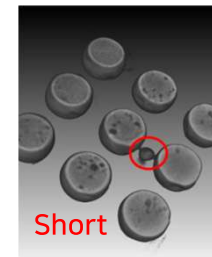
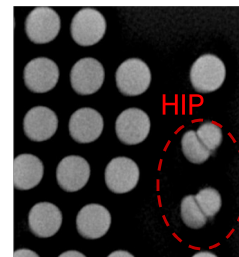
### “X-ray Inspection Video for Semiconductor/Battery”



#### HBM/SMT Semiconductor

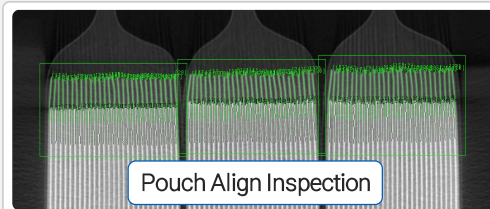
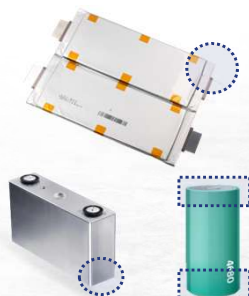


HBM TSV Inspection

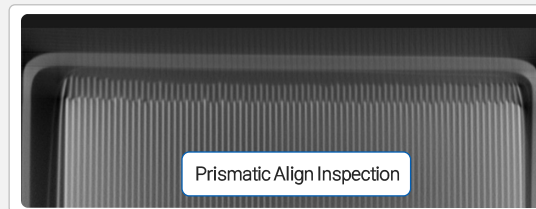


SMT Process – BGA Defect Inspection

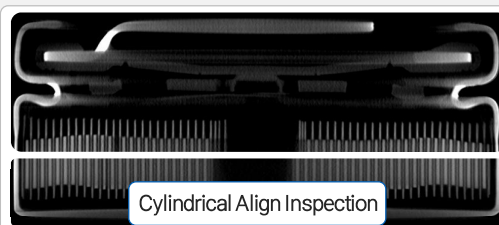
#### EV/ESS Battery



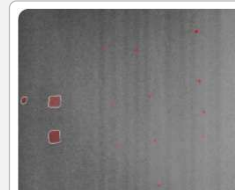
Pouch Align Inspection



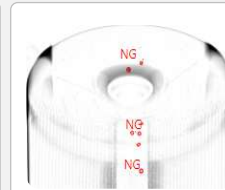
Prismatic Align Inspection



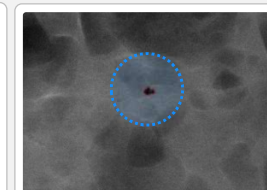
Cylindrical Align Inspection



Pouch, Prismatic Particle Inspection



Cylindrical Particle Inspection



Cathode Material Particle Inspection

# “LINAC system for NDT”

## Overview

Compared to conventional X-ray tubes, LINAC(Linear Accelerator) may produce high-energy X-rays up to 100 times higher. The device can perform 2D/3D examinations of large structures

## Application Range

### Non-Destructive Testing (NDT)

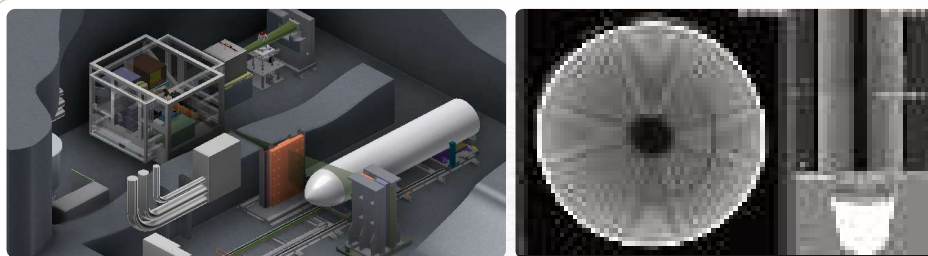
Large components for ships, power plants, and missiles: used to check for flaws in big structures like metal parts

### Container Inspection System(CIS)

Regarding enhancing the security of national logistics, it utilized in the field of unopened container inspection

## Tech Development

- Successfully developed and commercialized four LINAC models ranging from 1 to 15 MeV
- SEC has several related techs, such as cavity resonance frequency structure, electromagnetic field analysis, acceleration tube assessment, RF generation and induction/transmission matching tech, and magnetron control tech.



Missile Inspection system(3D Drawing) and Inspection Video

## Market Trend

- The military industry is the primary market for the LINAC system for NDT, and as the K-defense industry grows quickly, so does the need for inspection.
- The establishment of a green logistics system and the strengthening of logistics security in Korea are driving up demand for LINAC-based container security screening systems as part of the country's national logistics fundamental plan.



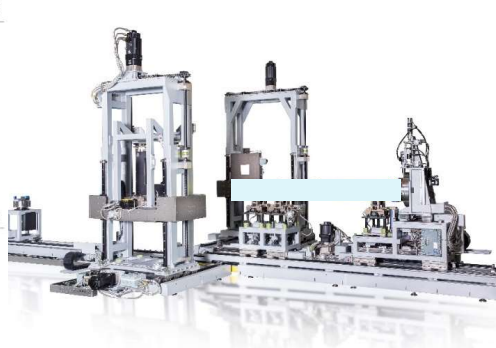
Kwangyang Harbor Container Inspection System DEMO Center and Test Video

## “LINAC System Enters the Defense Industry Market” (Cumulative orders KRW 41.3B)

Possesses Korea's only CIS demo center, **prepared to venture into a various industries**

Best in Korea

LINAC system  
Technology



### Essential Tech & Self-Production

- Cavity Simulation Tech
- Acceleration Tube Evaluation and Tuning Tech
- RF Generation, Induction/Transmission Matching Tech

### Development, Production Experience

- Development Experience 14yrs (Since 2010/Commercialized since 2017)
- **Cumulative Orders KRW 41.3B (Cumulated until Oct 2024)**

### Development, Commercialization

- 4 Models (1 to 15MeV)

### Multi-field Expansion Plan

- Medical 2MeV X-band LINAC Developing

### Only One in Korea

- CIS demo center(Kwangyang Harbor)  
fixed type 1, moving type 1

### Development, Manufacturing CS personnels

- 15 Employees



# “Research Analysis and Quality Control Tabletop SEM”

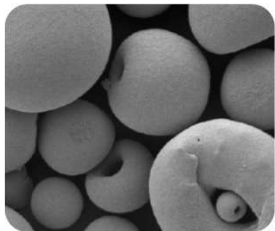


SEM is a device used to analyze the physical properties and surface of samples

The sample is exposed to an accelerated E-Beam by applying a high voltage between 1 to 30kV

Gather secondary electrons<sup>1)</sup> produced by the sample to create images

### ■ 분해능 분류



2000s

Tabletop SEM – 20nm~15nm

Normal SEM – 10nm~5nm

FE-SEM – 3nm~1nm

After 2010

Tabletop SEM – 10nm~5nm

FE-SEM – 3nm~1nm

※ The normal SEM market was replaced in the 2010s by the creation and performance enhancement of tabletop SEM, which reached 5nm



'07 – 1500M, 3000M



'17 – 4500M plus

Tabletop SEM

**SNE-ALPHA**

1) Secondary electron, Electrons released from inside of a material by particles or radiation incident on the Material

“ In 2023, Tabletop SEM accounted for 15.3% of total sales ”

### Current Core Business

- Tabletop Scanning Electron Microscope (SEM) with 5nm Resolution
- R&D and quality assurance in nano, bio, and new material domains, etc.

### Business under Development and Commercialization

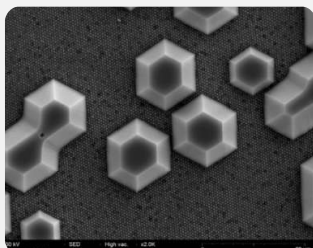
- Developing in-line SEM for examination of semiconductor processes
- Auto-SEM(automatic logistics/inspection) under development

### Derivative Business (Planning or early Development Stage)

- E-Beam Machining (combined with X-ray tube)
  - TGV; Through Glass Via Process
- E-Beam lithography for semiconductors

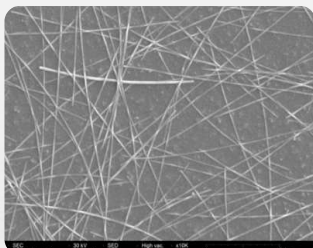
1

#### Gallium Nitride



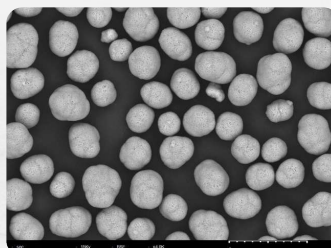
2

#### NANO Wire



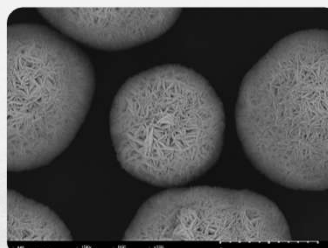
3

#### Cathode Material (Low Magnification)



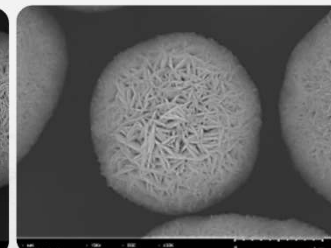
4

#### Cathode Material (Mid Magnification)



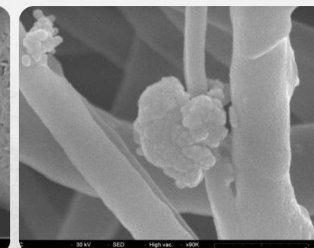
5

#### Cathode Material (High Magnification)



6

#### Fiber

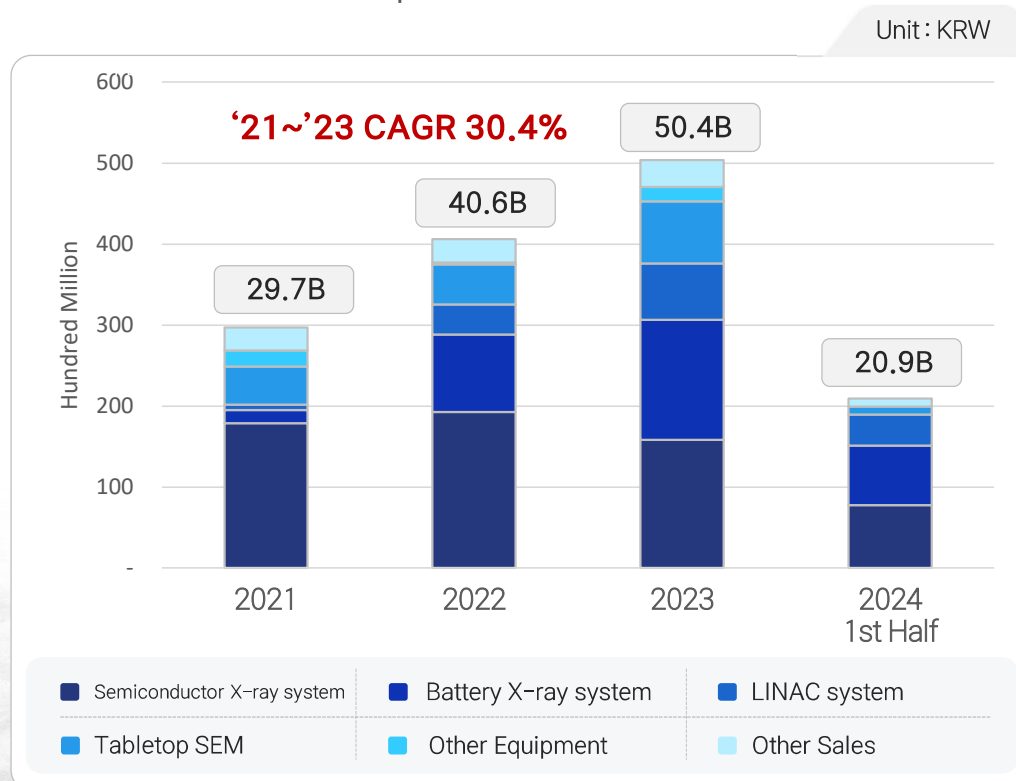


“2021~2023, Compound Annual Growth Rate(CAGR) 30.4%”

Sales Performance Table by Business (2021~2024 1<sup>st</sup> Half)

Unit : KRW Million

Sales Divisions	2021	2022	2023	2024 1 <sup>st</sup> Half	Total
X-RAY Scanner (semiconductor)	17,893	19,286	15,817	7,781	60,777
X-RAY Scanner (Battery)	1,603	9,561	14,852	7,362	33,378
LINAC	690	3,694	6,942	3,830	15,156
Tabletop SEM	4,683	4,959	7,674	978	18,294
Other Equipment	1,997	245	1,765	-	4,007
Other Sales	2,842	2,865	3,325	971	10,003
<b>Total</b>	<b>29,708</b>	<b>40,610</b>	<b>50,375</b>	<b>20,922</b>	<b>141,615</b>

Sales Graph (2021~2024 1<sup>st</sup> Half)



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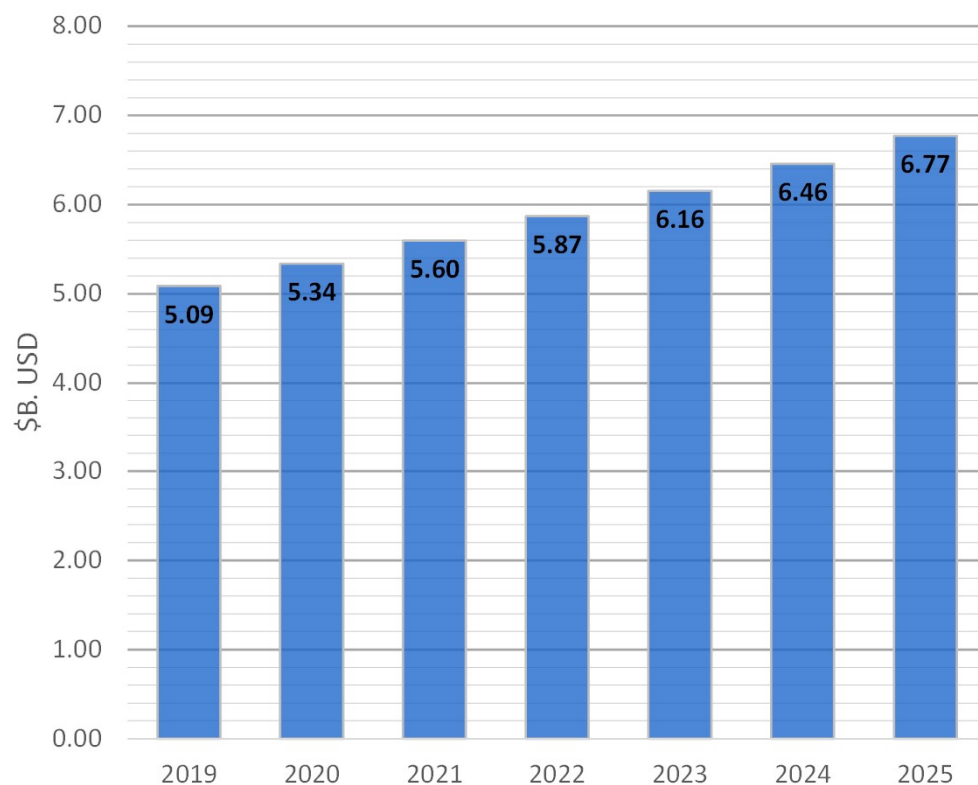
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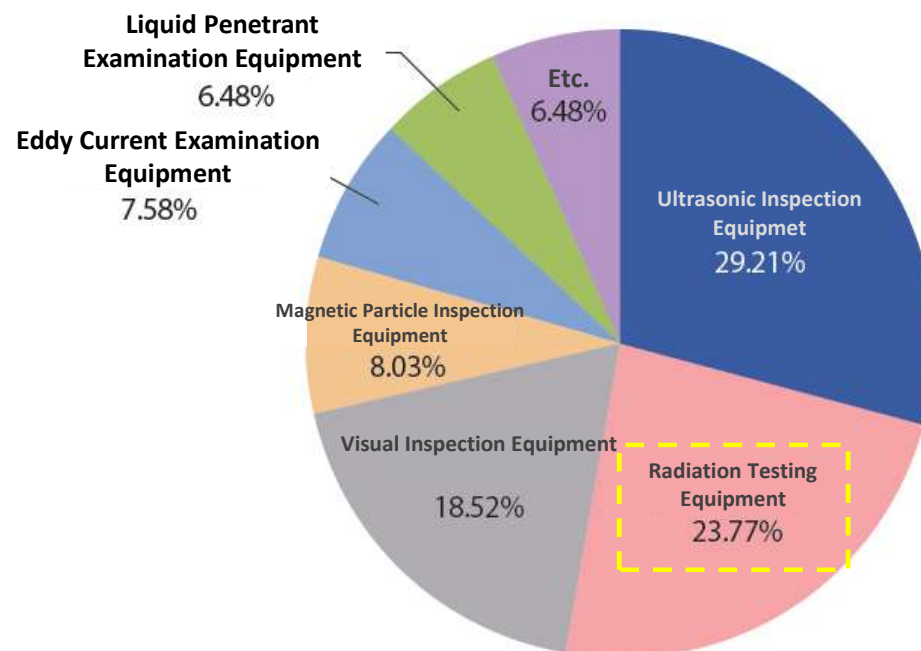
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“2019, The Radiation Field Accounted for 23.77% of Total NDT Equipment With a \$1.21B Market Size”

Global NDT Equipment Market Size and Forecast



2019 Market Share by Sectors



• Source : NON-Destructive Testion Equipment Market 2019, Reorganization of the Korea Institute of Science and Technology Information

## “X-ray System’s Front Industry (semiconductor/Battery) Market Growth Forecast”

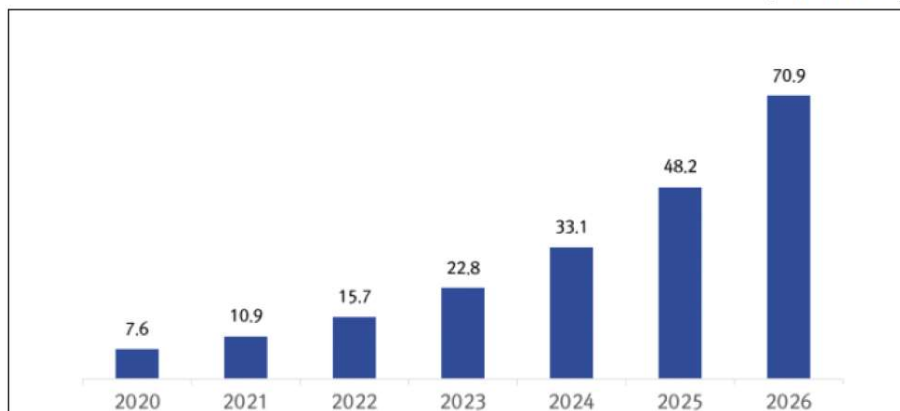
### Semiconductor Packaging Market Forecast

Division	2022	2028	Average Annual Increase
Advanced Packaging Market	\$44.3B (Approx.. KRW 61.7 Trillion)	\$78.6B (Approx.. KRW 109.4 Trillion)	10.6 %
Other Packaging Market	\$50.7B (Approx.. KRW 70.6 Trillion)	\$64.7B (Approx.. KRW 90 Trillion)	3.2 %

Source : Yole Development, 2023.06

### HBM-based AI Semiconductor Market Outlook

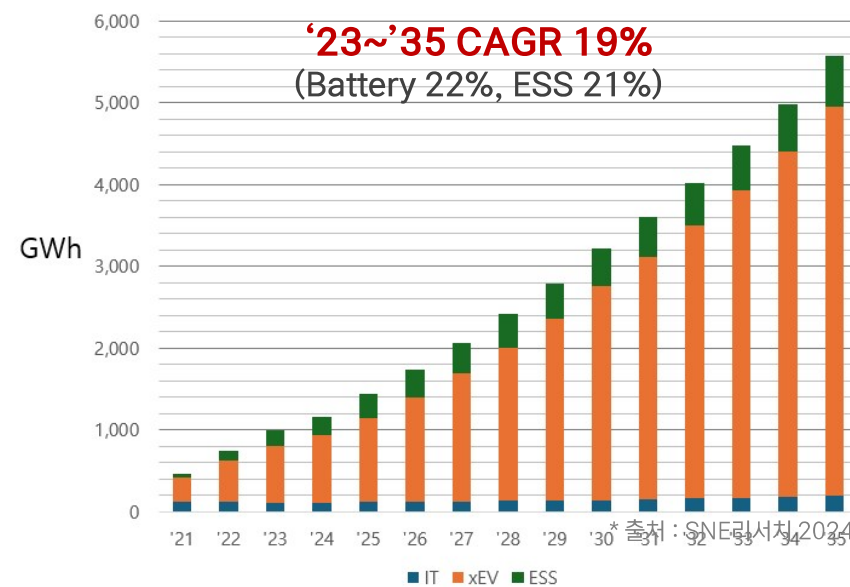
Unit : USD Billion



\* Source : 좋은정보사 2024(Quoted from Statista)

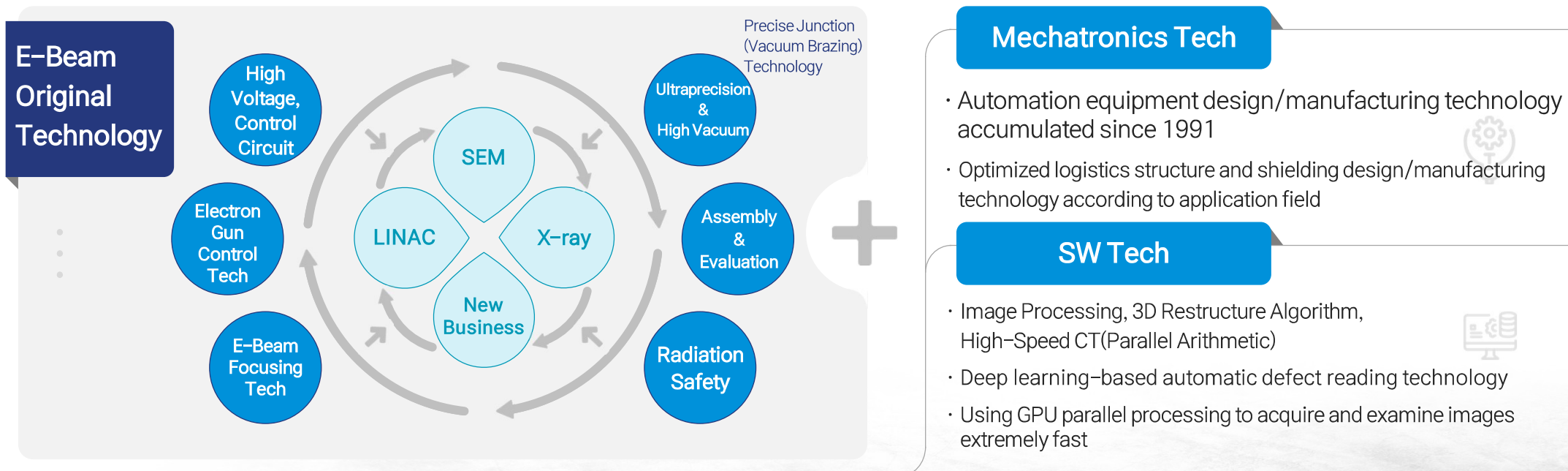
분류	2020	2021	2022	2026	CAGR (20~26)
AI반도체	87.04	119.78	164.99	1591.03	42.3%

### Demand Forecast by Battery Usage Field





# Original Technology for E-Beam Generator and Mechatronics & SW Technology



### X-ray Inspection System

- First-time internalization of X-ray tube in Korea, creation and commercialization of world-class performance
- Development and commercialization of the world's only in-line high resolution open-penetration X-ray tube

### LINAC System

- Enhanced E-Beam stability using ultra-precision processing methods at the nanoscale
- Imaging conditions can be optimized for each major part location using 0.1MeV unit energy control

### Tabletop SEM

- Internalization of Tabletop SEM for the first time in Korea and implementation of 5nm level high resolution
- Improved customer convenience with sample loading and automatic setup functions that are twice as fast as domestic competitors

## 2 Key Competitiveness

I. Introduction

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IV. Finance Status & Business Plan



# “Excellence of Technology and Products Proven by Various Awards and Certifications”



2000.12.16. ~ 현재



한국산업기술진흥협회,  
기업부설연구소 인증

2001년 ~ 현재



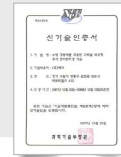
중소벤처기업부, 기술혁신형  
중소기업(Inno-Biz),  
Aa등급 선정

2006.09.28.



중소기업청, 중소기업  
기술혁신대전 동상 수상

2007.12.20. ~ 2009.12.19.



과학기술부, 탁상형 주사  
전자현미경 (Tabletop SEM)  
신기술(NET) 인증

2008.04.29. ~ 2010.04.28.



지식경제부, 1 $\mu$ m Focal spot의  
개방-투과형 X-ray Tube  
신기술(NET) 인증

2009.06.22.



노동부,  
이달의 기능한국인 선정  
—  
사회적 기여도가 높은  
기능인 출신 기업인

2009.12.02.



한국산업기술시험원,  
한국정밀산업기술대회  
전기·전자 부문 수상

2010.12.30.



조달청 우수제품지정  
(MINI-SEM /  
10.12~13.12)

2013.06.20.



산업통상자원부,  
우수기술연구센터  
(ATC) 지정

2013.07.10.



산업통상자원부,  
국제나노기술의나노융합대전  
SEM 분야 산업기술부문  
우수상 수상

2019.12.17.



중소벤처기업부, 소재·부품·  
장비 강소기업 100 선정

2020.11.09.



산업통상자원부(현재 관리기관  
중기부로 변경), 혁신기업  
국가대표 1000 선정

2023.04.01.














중소벤처기업부,  
글로벌 강소기업 1,000+ 선정

## “Protect and Prevent Leaks of Core Technologies by Registered Intellectual Property Rights and Technologies”

### Owned Patents and Rights

Tech Section Total  
116 Intellectual  
Property Rights

Patent Application 29	Patent 61
International Patent 6	Utility Model Application 1
Brand 11	Registered Design 1
Software Patent 7	기술 임치 37건

LINAC	Domestic	Brand : 2	Software Copyrights : 7	Patents : 1	Patents Application : 3	13						
SEM	Domestic	Patents : 4				4						
Tube	Domestic	Utility Model Application : 1	Patents : 14	Patents Application : 2	Overseas Patent : 1건 	18						
X-ray Inspection system	Domestic	Brand : 5	Patents : 34	Patents Application : 24	Overseas Patents A: 5     	68						
Others	Domestic	Design : 1	Brand : 4	Patents : 8		13						
Total	Domestic	Design: 1건	Brands: 11	Software Patents: 7	UMA : 1	Patents : 61	Patents A : 29	Overseas	Patents : 4	    	Patents : 2	116

### Patents and Tech Protection

- ✓ Protection of technology through ongoing evaluation of fundamental patents' rights stability and infringement risk by a patent law firm



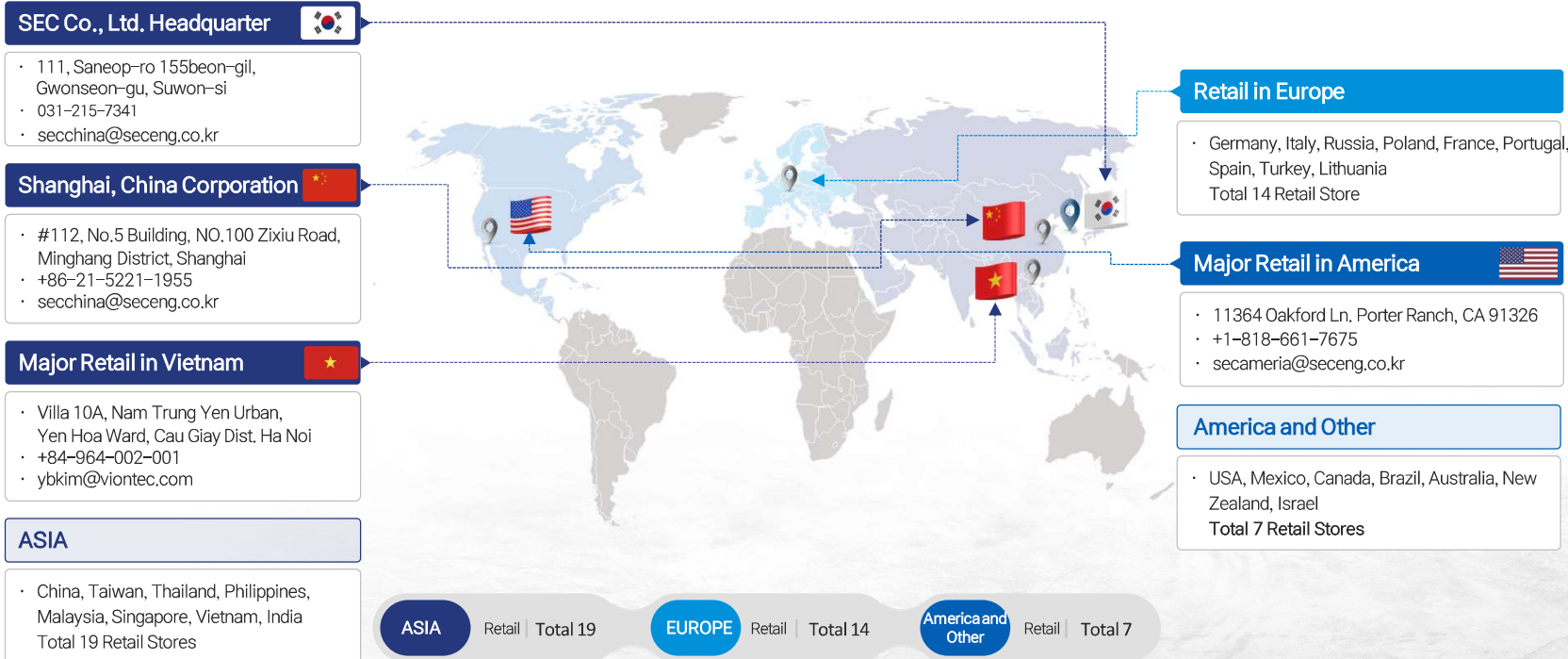
Key know-how is secret, easy to imitate	SEC's main tech is protected by Patents	범용기술은 실용신안을 통해 특허 외 지식재산권으로 보호	노하우 기술은 대외비 관리 및 기술 임치 등록
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### Key Patents by Major Base Technology

Technology	Title	Nation	Application Number	Date	Patent Number
X-ray Tube E-Gun Configuration/Control and Target Lifespan Enhancement Technology	X-ray Generator and Control System	KR	2015-0044831	2015.03.31	10-1648063
	X-ray Generator	KR	2016-0162454	2016.12.01	10-1909670
X-ray system Tech for Battery	X-ray Equipment and X-ray Examination System	KR	2020-0107098	2020.08.25	10-2288818



# “Established Global Network by 1 Corporation, 40 Retail Stores” Maintained an average of over 50% of exports over the past three years



### 3 R&D and Development Direction

## “Plans for future growth by Market Expansion and Development of” New Areas of Expertise”

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### Semiconductor X-ray system

Section	Technology	Details	Period	Est. Cost
Market Expansion	HBM Semiconductor TSV, Micro-bump 2D/3D CT Examination	Samsung, SK, Micron and Etc. Inspection was previously done as a post-process when the product was still in the packing state, <b>During the wafer production phase of the process, a new inspection requirement emerged</b> , additional test is in process with clients.	~'24.12.31	KRW 3.9B (National Project Fund 2.33B)
	High Speed 3D CT Examination for SMT BGA	Amkor, SK, Micron, Etc. Reducing costs and developing stability of system function.		
New Development	Through Glass Via(TGV) 2D examination	JNTEC, Absolics, Etc. Void defect examination that occurs inside of Glass Plate(TGV) Examination Performance Test in Process with Void Test Equipment Orders available after review the result of Test	~'25.12.31	Expected Development under orders (National Project Fund 1B)

### Battery X-ray system

Section	Technology	Details	Period	Est. Cost
Market Expansion	Pouch/Prismatic 3D CT Examination	Overseas Corp. (Verkor, ACC, Etc.) Prototype evaluation completed. Additional orders in progress for mass production application	-	-
	Cylindrical Battery 2D/3D CT Examination	LG ES Prototype Evaluation completed. Additional orders in progress for mass production application	-	-
New Development	Pouch Battery Completed Cell 2D Integration Examination	LG ES 向, Conduct final inspection before shipment, including metal contaminants and folded electrodes in the completed cell	~'24.11.30	Development under orders (Amount KRW 0.45B)
	Battery Powder Material Metal Contaminants 2D Examination	Ecopro BM, LG Chemical, Posco, Etc. Inspection of metal contaminants in Cathode, Anode, Conductive additive	~'27.07.15	KRW 2.25B (National Project Fund 18B)

### LINAC system

Section	Technology	Details	Period	Est. Cost
Market Expansion	LINAC Entry into Overseas Market	Troy-Met(Turkiye), NCSIST(Taiwan), Etc. First Oversea LINAC order received in 2024, possible future market expansion	-	-
	Mobile CIS Overseas Market	Mobile CIS being developed via national project Expecting orders from Philippine Customs by 2025(Sales in progress)	~'24.12.31	KRW 3.16B (National Project Fund 2.41B)
New Development	HPM based Anti-Drone System Development	Military/Security/Airport/Power Plant, Etc. First Prototype Evaluation completed via national project	~'29.12.31	KRW 1.31B (National Project Fund 1.17B)
	LINAC/Anti-Drone Klystron Internalization Development	15MeV LINAC and anti-drone requires Klystron with high output, instead of existing Magnetron Expecting Radiation National Project (Mar, 2025)	~'29.12.31	(Expected National Project Fund 5B)

### SEM

Section	Technology	Details	Period	Est. Cost
Market Expansion	Auto SEM Development	Development of an Auto SEM that can automatically enter and inspect logistics data based on user preferences	~'25.12.31	KRW 0.15B
New Development	In-line SEM Development for Semiconductor Process Examination	ODM contract with semiconductor producing company Received KRW 300M for 1st prototype development fee Expecting '25~'26 Semi In-line, Full in-line contract (각각 10B/4.5B 예상)	~'26.12.30	KRW 5.8B (ODM Development)
	EBM Development for Ultra-precision processing and welding (E-Beam Machining)	1st Goal : Development for Glass Plate TGV Hole Process In the case of the existing laser method, it is difficult to process micro holes due to the occurrence of burrs When using an E-beam, no burrs occur even in ultra-micro processing of at least 3μm, so it can replace the laser process.	Planning Stage	-

### 3 R&D and Development Direction

- ✓ Market Growth Forecast
- ✓ Owns key competitiveness
- ✓ Development in various Fields in Process

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## SEC Growth Power

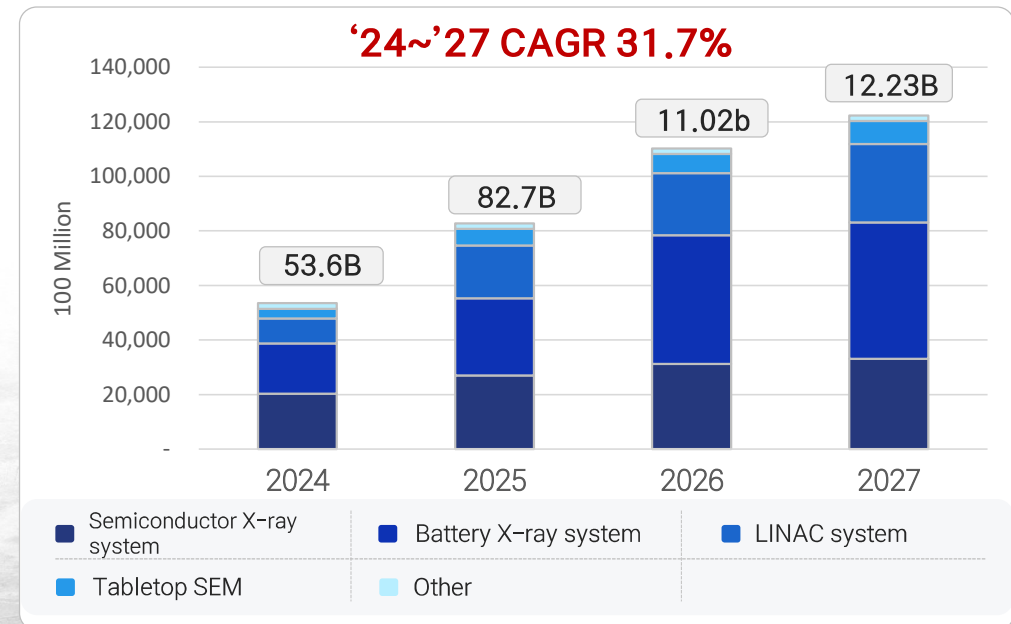
2024~2027 Growth rate 31.7%(Est.)

Estimated Sales by Businesses(2024~2027)

Unit : KRW 1Million

Businesses	2024	2025	2026	2027	Total
Semiconductor X-ray system	20,279	27,005	31,240	33,139	111,663
Battery X-ray system	18,444	28,301	47,171	49,947	143,862
LINAC system	9,143	19,378	22,815	28,768	80,104
Tabletop SEM	3,534	6,015	7,020	8,424	24,992
Other	2,167	2,000	2,000	2,000	8,167
<b>Total</b>	<b>53,567</b>	<b>82,699</b>	<b>110,246</b>	<b>122,278</b>	<b>368,789</b>

Sales Estimation Graph(2024~2027년)





A large, diagonal, circular inset on the left side of the slide shows a microscopic view of a semiconductor wafer. The wafer has a grid of circular dies, and a red laser line is visible across it. The background of the slide is dark blue with a circuit board pattern and a globe.

# THANK YOU

SUPERIOR SERVICE & EXCITING CHALLENGE!

