

# ULTECH Co., Ltd.



[www.ultech.co.kr](http://www.ultech.co.kr)  
[www.memstech.co.kr](http://www.memstech.co.kr)

- Company name: ULTECH Co., Ltd.
- Business category: Manufacturing of Semiconductor Equipment, MEMS, LED, Display & Solar Cell Equipment
- Foundation date: March 15, 1998
- The president: Suk, Chang-Gil
- Headquarter Office: 8-2, Horim-dong, Dalseo-gu, Daegu-si, Korea  
TEL. 82-53-583-7565  
<http://www.ultech.co.kr>



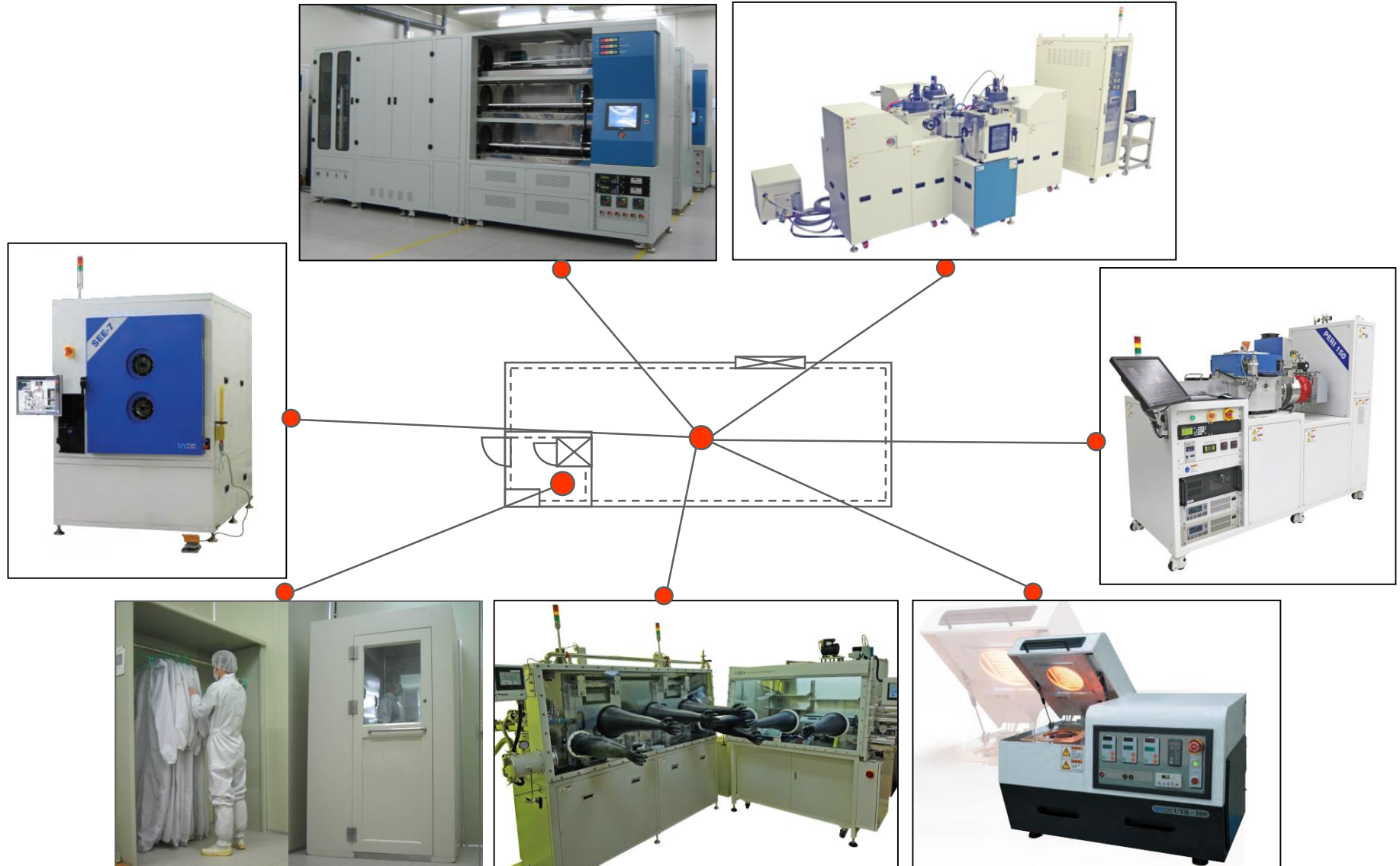
# Primary Customers

- Samsung Electronics (SEC)
- LG Electronics (LGE)
- LG Chemical (LG Chem)
- LG Innotech
- QSI
- WISOL
- Korea Advanced Nano-fab Center (KANC)
- Electronics and Telecommunications Research Institute (ETRI)
- Seoul National University
- Pohang university of Science and Technology (POSTECH)
- Korea Advanced Institute of Science and Technology (KAIST)
- India (IIT Bombay, RCI)
- Malaysia (UniMAP, USM)
- Russia (Avangard, NIIS, SIGNAL)
- China (KunMing University, CQWN)
- Oriental Chemical Industry (OCI, Indonesia)
- Istanbul Technical university MEMS research center (ITU-MEMS , Turkey)
- Integrated Solutions (Pakistan)

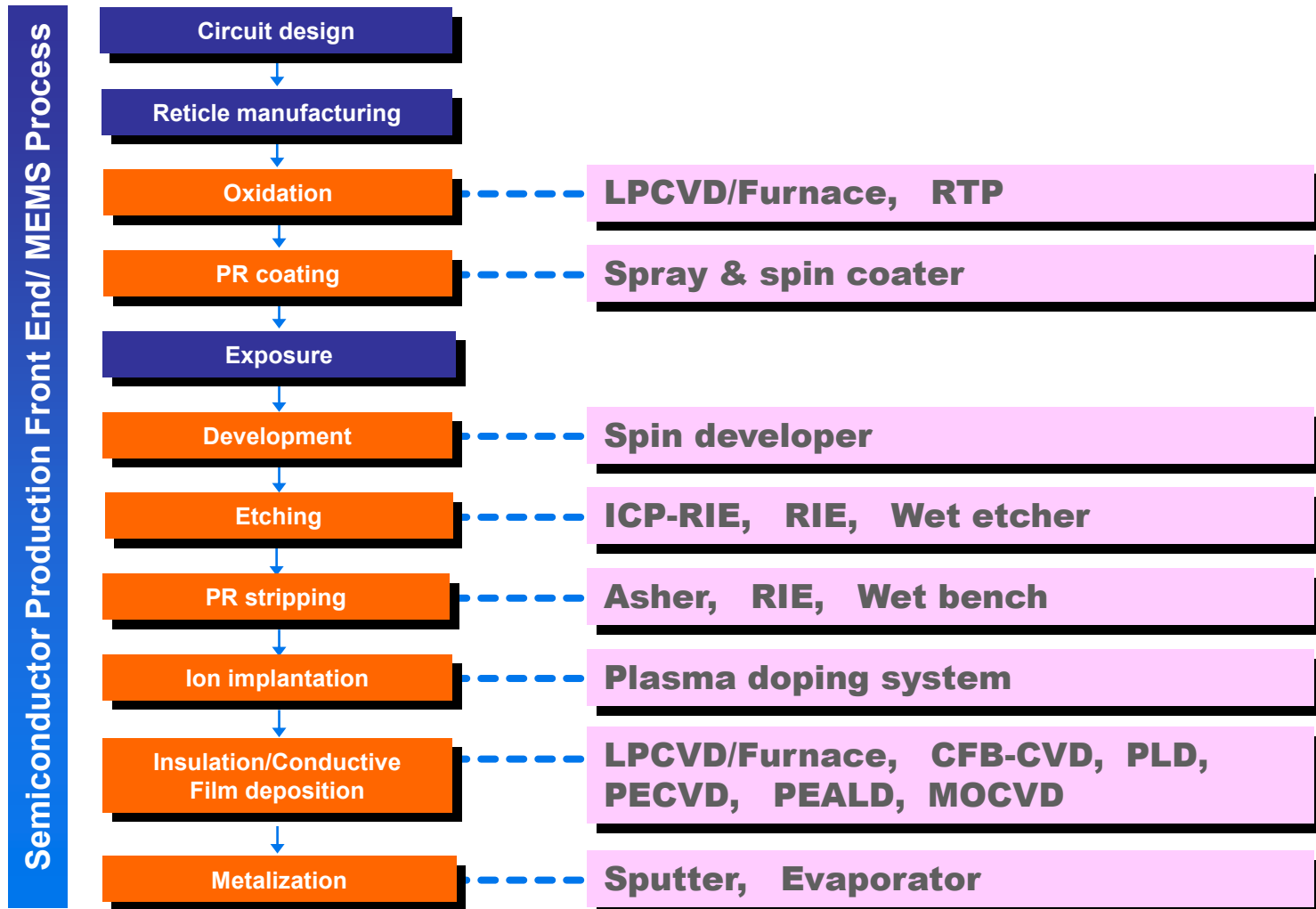
- PE-ALD/CVD system (for demonstration)
- Sputter system (for demonstration)
- Evaporator system (for demonstration)
- RTP system (for demonstration)
- Clean room (class 10,000)
- Auto welder & tube facing tool
- Leak detector
- RGA (Residual Gas Analyzer)



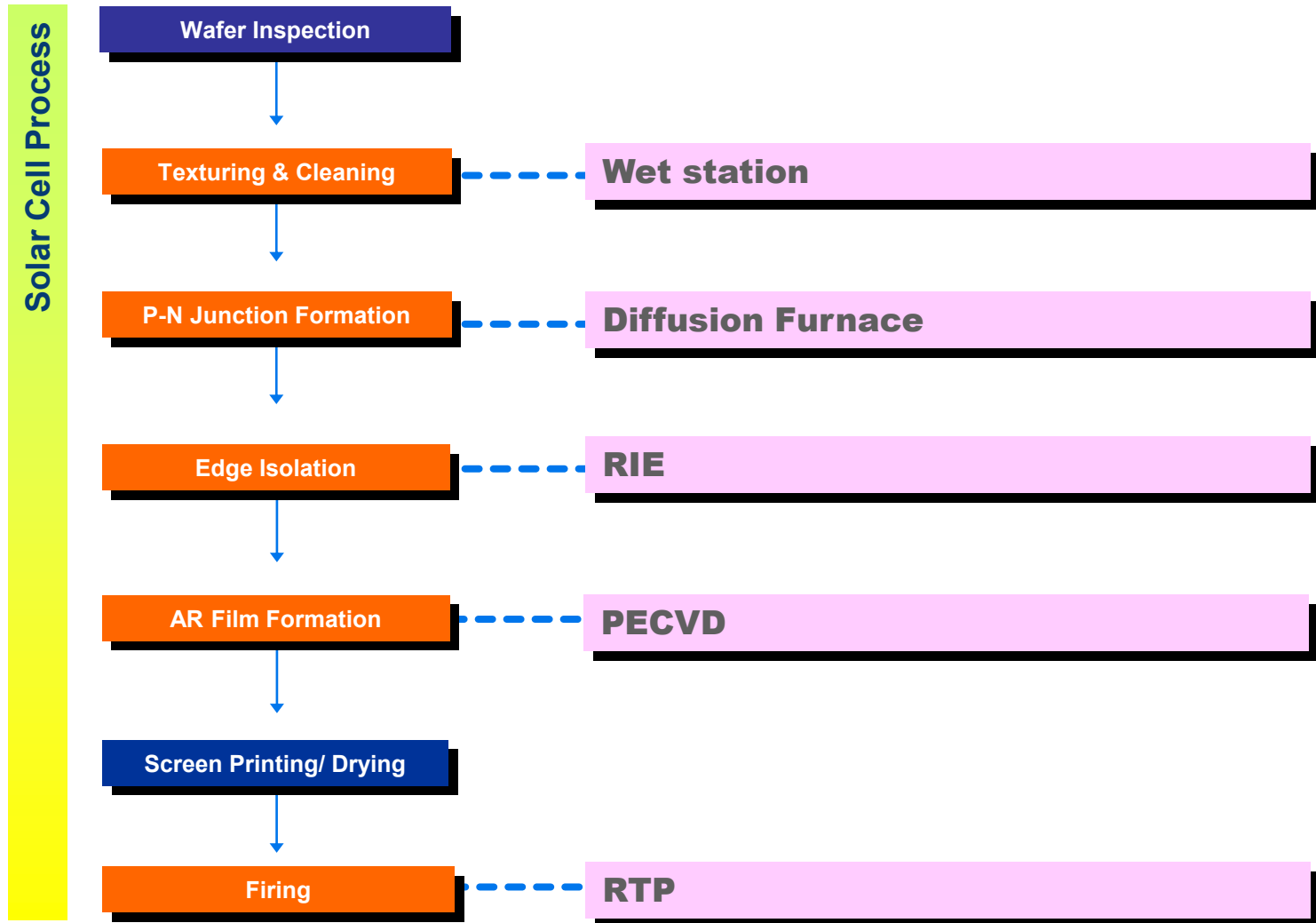
# Inner View of Fab. (Manufacture/ Process Test)



# Main Products and Applications

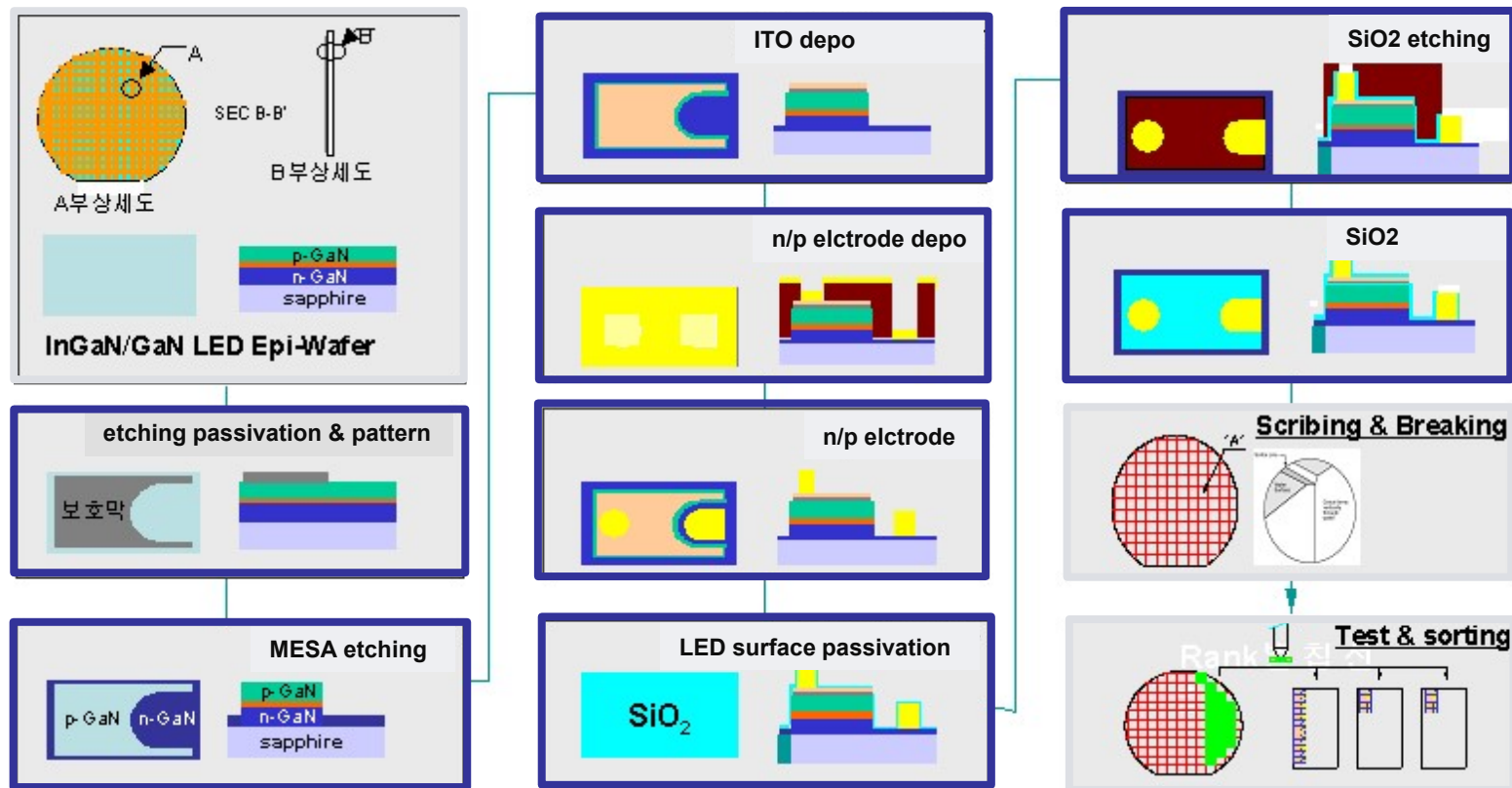


# Main Products and Applications





# LED Process Sequence



Systems made by ULTECH Co.



## Sputter System

- Magnetic thin films layer coating
  - Opto-electronic films coating
  - Reflective and anti-reflective optical coating
  - Industrial machinery & tools hard coating
  - Conventional materials coating
  - Metal electrode deposition of information & communication device
- (Resonator, filter, oscillator, capacitor, PTC, NTC, etc.)



Rotation Module

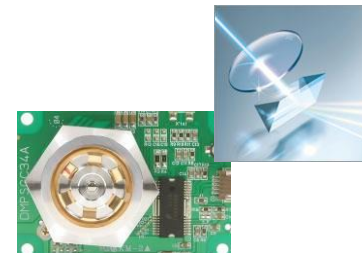


Roll to Roll system

ULTECH Co., Ltd.

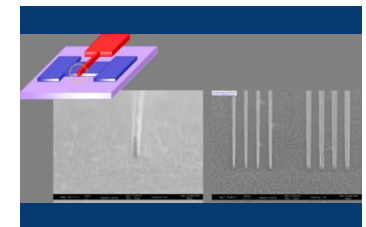
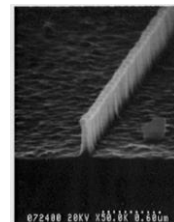
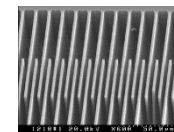
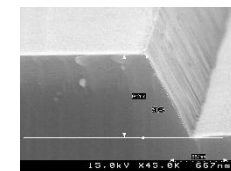
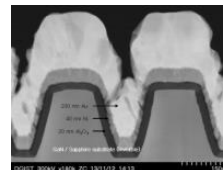
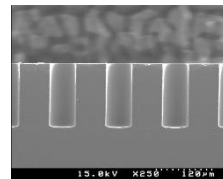
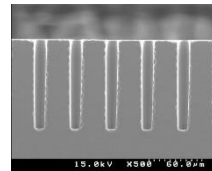
## Evaporator System

- Optical coatings of rotational symmetry planes such as polygon mirrors
- Monolayer or multilayer conventional materials coating
- Alloy metal coating (Co-evaporation)
- Organic materials coating (OLED)
- Spintronix research  
(UHV & ultra low temperature system)



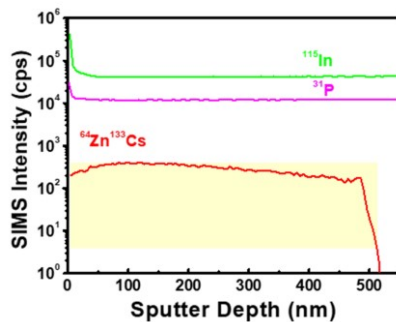
## Dry Etching System (ICP-RIE, RIE)

- Bulk / Poly silicon etching (MEMS & NANO)
- Dielectrics etching ( $\text{SiO}_2$ ,  $\text{Si}_3\text{N}_4$ , etc.)
- Compound semiconductors etching (GaAs, GaN, etc.)
- Polyimide etching



## RTP System

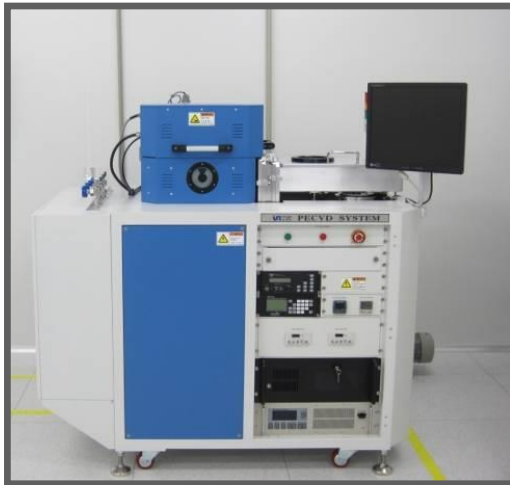
- Thin Gate Oxidation(Low Pressure)  
(Nano device)
- Rapid Annealing  
(Atmospheric or Low Pressure)





## PECVD System

- Amorphous silicon deposition
- Poly silicon deposition
- Silicon oxide deposition
- Silicon nitride deposition
- Metal oxide deposition
- High-k dielectrics deposition



## ALD System

- Metal deposition : Ru, TiN, WN, AlN,
- Poly silicon deposition
- Silicon nitride deposition
- Metal oxide deposition: Al<sub>2</sub>O<sub>3</sub>, HfO<sub>2</sub>, ZrO<sub>2</sub>, ZnO, TiO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub>, CIGS, GIZO...





## OPV/Perovskite Solar Cell

- ETL/Active layer/HTL deposition
- Metal deposition
- TCO deposition
- Embedded spin coater
- Glovebox
- Mask aligner

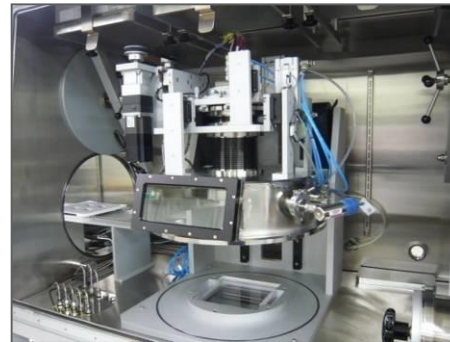
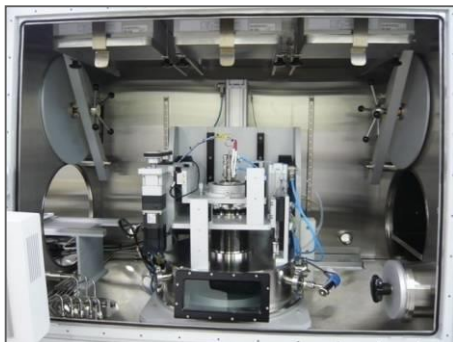


Cluster system



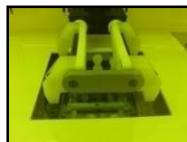
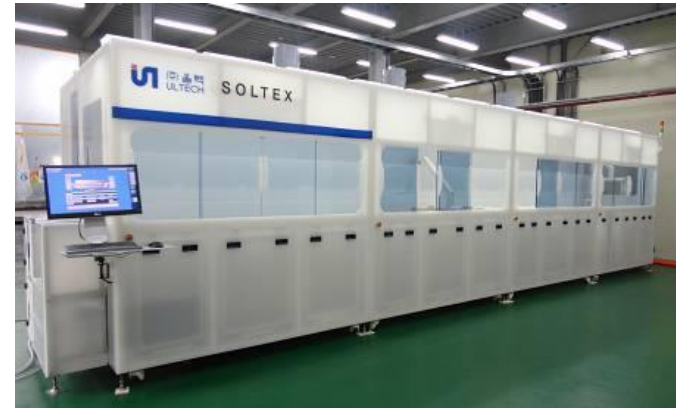
## OLED system

- Organic EL deposition
- Metal deposition
- Epoxy dispenser
- UV curing
- Vacuum encap.
- Glovebox
- Mask aligner
- Plasma precleaning



## Wet Bench System

- Si Anisotropic Wet Etch
- PSL, Electroplating
- V-Groove, U-Groove, Cavity formation
- Membrane, micro-channel formation
- Available mixing of Cleaning /  
Chemical etching /  
Solvent /  
Developer bench





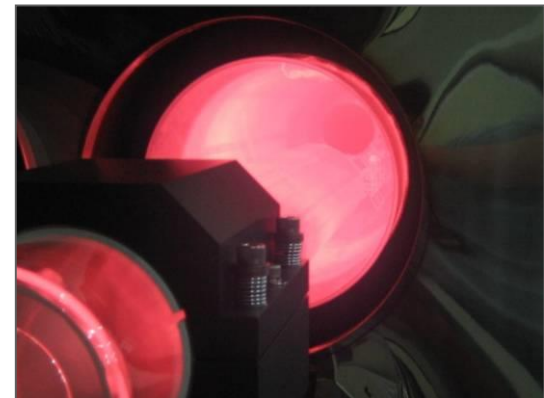
## CVD System (MOCVD, HWCVD, Graphene, CNT)

- Amorphous silicon deposition
- Poly silicon deposition
- Silicon oxide deposition
- Silicon nitride deposition
- Metal oxide deposition
- High-k dielectrics deposition



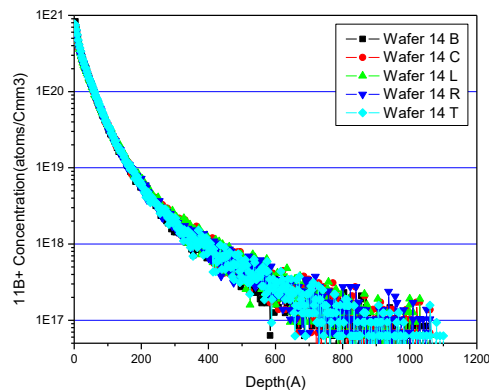
## LPCVD/Furnace System

- Low stress / Stoichiometric silicon nitride
- Poly / Doped-poly silicon
- Silicon oxide
- Wet / Dry oxidation, Annealing
- LTO
- SiC epi.
- Diffusion



## Plasma Doping System

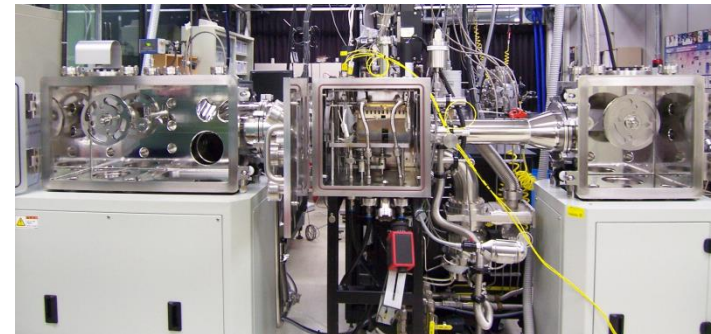
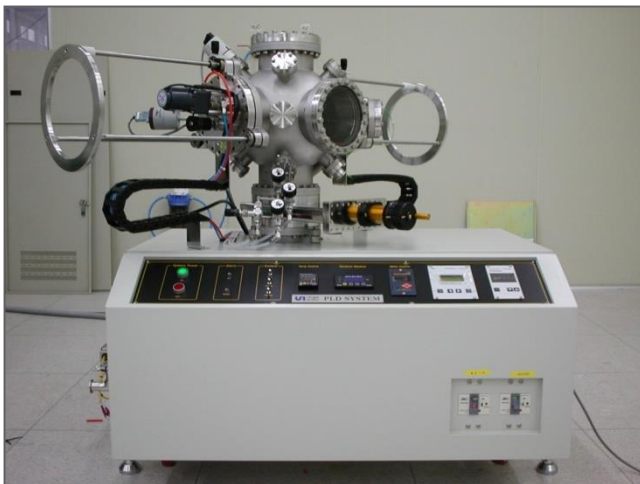
- Ultra-shallow junction doping for sub-100nm CMOS
- Conformal doping of non-planar CMOS and other electronic devices
- Poly-silicon gate & trench sidewall doping
- Active matrix doping (LCD,PDP,AMOLED)





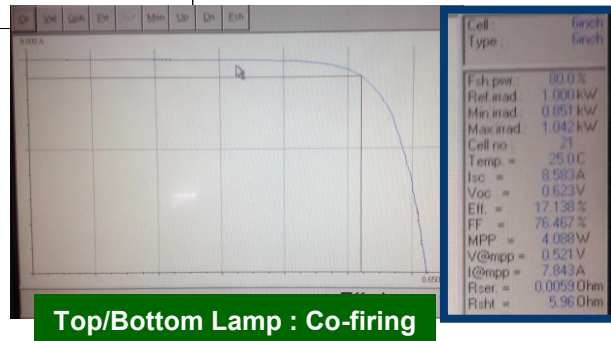
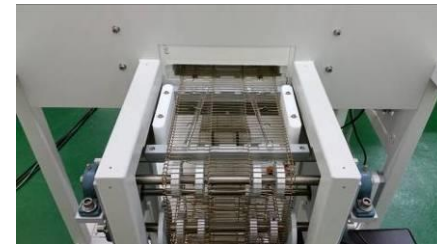
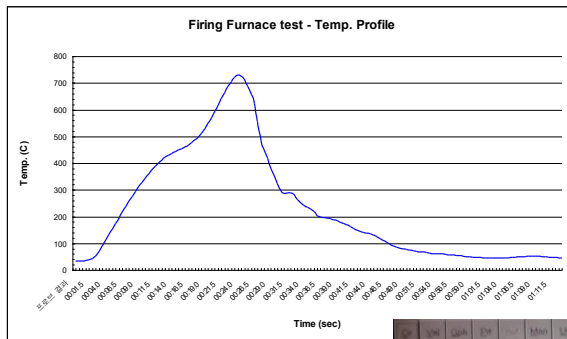
## PLD System

- Super conductor material
- Compound semiconductor
- Oxide
- Metal



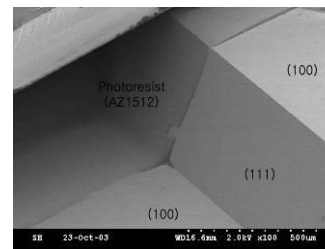
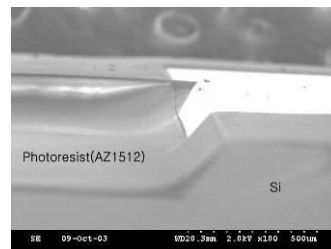
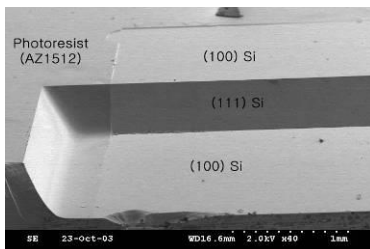
## Dryer & Firing

- Removal of Solvent & Volatiles & Resin
- Dissolution of SiN:H
- Metal Sintering
- Contact formation through fusing and alloying
- Recrystallization solidification

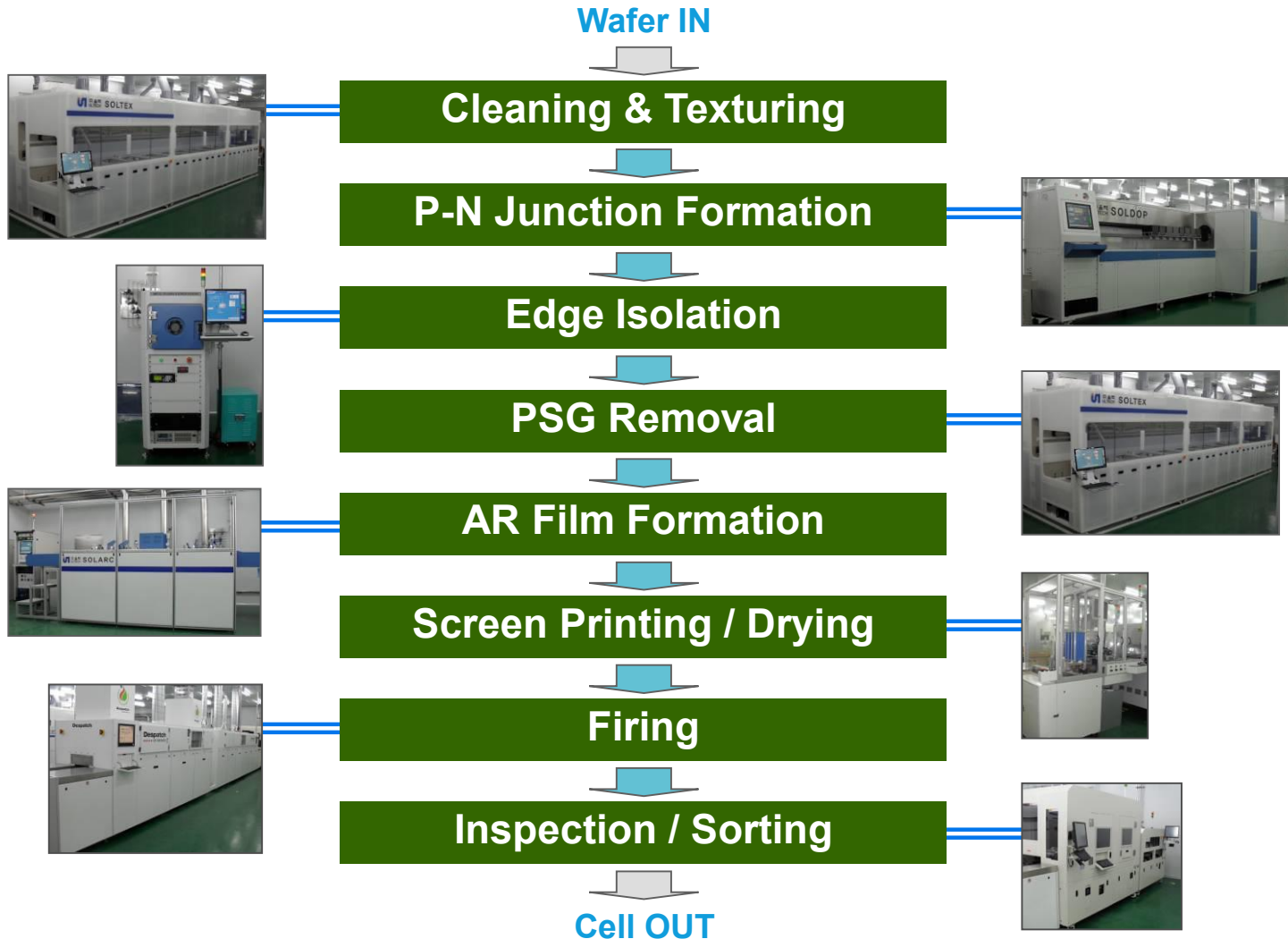


## Spray/Spin Coater

- Photoresist(PR) coating for defining patterns in microcircuit fabrication
- Dielectric/insulating layers coating for microcircuit fabrication (polymers, SOG, Silk, etc.)
- Magnetic disk coating (magnetic particle suspensions, head lubricants, etc.)
- Flat screen display coating (anti-reflection, conductive oxide, etc.)

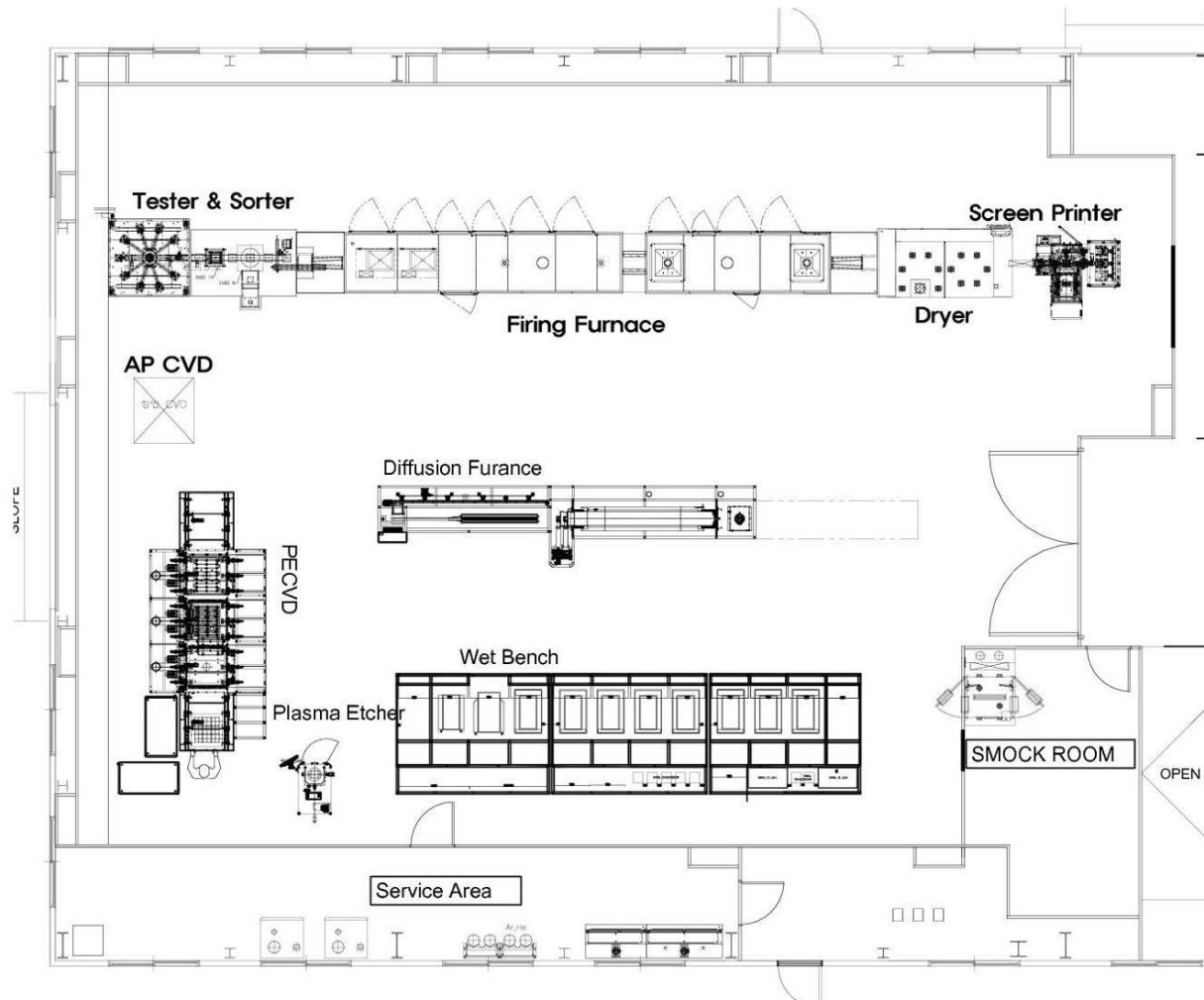


# Solar Cell Turnkey Line





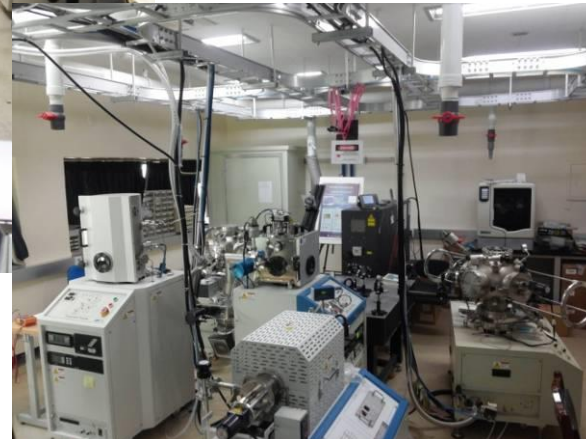
# Solar Cell Turnkey Line



# “S” University Research Lab.



- 2003년 \_ PLD #1
- 2006년 \_ PLD #2
- 2009년 \_ PLD #3
- 2011년 \_ PLD #4
- 2012년 \_ Thermal Evaporator
- 2013년 \_ Sputter





# “K” University Research Lab.



- 2006년 \_ RIE
- 2007년 \_ Furnace
- 2008년 \_ SPUTTER #1
- 2009년 \_ SPUTTER #2  
Vertical LPCVD
- 2010년 \_ SPUTTER #3  
Furnace & RTA
- 2011년 \_ SPUTTER #4  
RTA #1
- 2012년 \_ RTA #2
- 2013년 \_ UV 세정기
- 2014년 \_ Box Furnace



# "Y" University Solar Cell Fab.



<PECVD>



<POCl3 FURNACE>



<OVEN>



<WET BENCH>



<WET SCRUBBER>

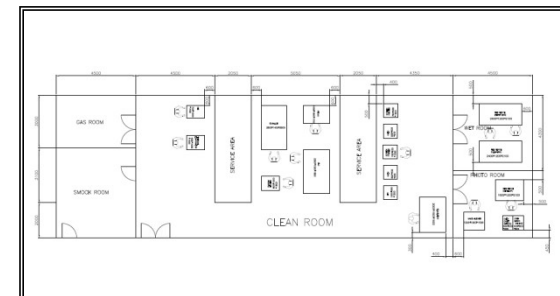


<HEAT & WET SCRUBBER>



<GAS CABINET>

# "U" University Solar Cell & NMOS Fab.



# “U” University Solar Cell & NMOS Fab. Equipment list

No.	System	Q'ty	PROCESS	REMARK
1	WET BENCH	1	Pre-cleaning, Metal etching, Si etching	N-MOS & Solar cell
2	WET BENCH	1	PR removal	N-MOS
3	FURNACE (4-tubes)	1	Wet oxidation, Dry oxidation, Diffusion, Metal alloy	N-MOS & Solar cell
4	RIE	1	Oxide etching	N-MOS
5	THERMAL EVAPORATOR	1	Metal deposition	N-MOS
6	SPIN COATER	1	PR coating	N-MOS
7	OVEN	2	Soft / Hard baking	N-MOS
8	MASK ALIGNER	1	Mask alingment & UV exposure	N-MOS
9	PECVD	1	AR layer coating	Solar cell
10	PLASMA ETCHER	1	Edge isolation	Solar cell
11	PRINTER	1	Metal paste printing	Solar cell
12	OVEN	1	Metal paste drying	Solar cell
13	RTP	1	Firing	Solar cell
14	I-V INSPECTION	1	Cell efficiency measurement	Solar cell
15	ALD	1	Al <sub>2</sub> O <sub>3</sub> deposition	Solar cell