

# Thermal Evaporator System (Solar cell)

## (Model : Solar – Subway)



### Application > Perovskite solar cell, DSSC, OPV, OTFT Process

- Au, Al, Ag, LiF, Cr & MoO<sub>3</sub>, TiO<sub>2</sub>, Etc Metal & Metal Oxide Process
- AlQ<sub>3</sub>, C60, TPD, Pentacene, Etc Organic & Inorganic Process
- **Perovskite** Process (MAI (CH<sub>3</sub>NH<sub>3</sub>I), PbCl<sub>x</sub>, PbI<sub>x</sub>, etc)

### Specification >

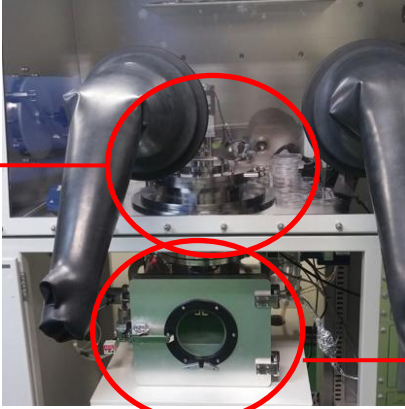
Substrate Size	Piece ~ Optional (Circular or Rectangular type)
Source Power Supply	A.C or D.C Power Supply
Thermal Source	Single ~ 4 ea (Optional) Metal & Organic Single layer or Multi layer or Co-evaporation
Thickness monitor	Rate monitoring or Rate control type
Loadlock chamber	Optional (With Integration Glove box)
Ultimate Pressure	< 3 x 10 <sup>-7</sup> Torr
Pumping Speed	< 5 x 10 <sup>-6</sup> Torr (Within 5 minute, after sample loading)
Film Uniformity	< ±5% (WIW, WTW, RTR)
System Operating Type	Semi-Auto or Fully auto Control (Using PLC Base Touch screen or P.C Monitor)

# Thermal Evaporator System (Solar cell)

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### Specification

#### Chamber >



Main Chamber : Rectangular Type  
Loading Chamber : Circular Type (Optional)

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Two Chamber Type (Optional : One Chamber)

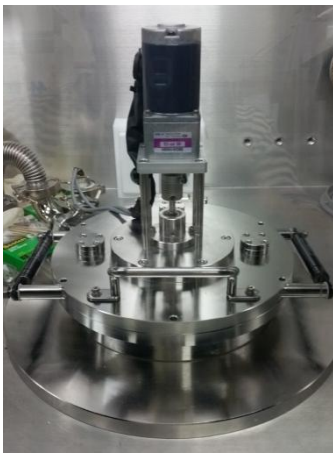
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Material : SUS 304

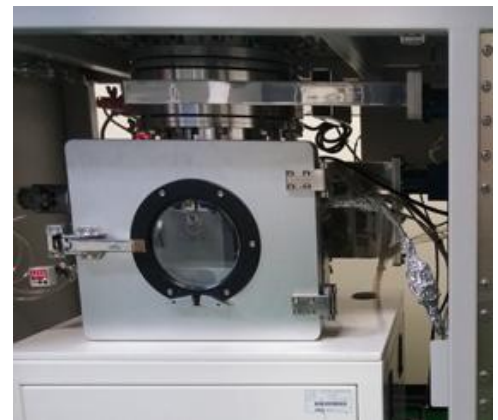
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Chamber internal shield cover  
(Easy exchange type)

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**Loading Chamber**  
(For sample loading/ Unloading)



**Main Chamber**  
(For source refill or boat replace)

#### Vacuum pump



Turbo pump (260 L/Sec(N<sub>2</sub>), Optional)  
Corrosive resistance Turbo pump (**For Perovskite**)

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Rotary pump (Optional : Dry scroll pump)

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Gate size : ISO 200 (Optional)

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High vacuum valve : ISO 100 (Optional)

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#### Substrate



Sample Size : 100mm x 100mm 1 sheet (Up to 8")

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Shadow Mask (Customer define)

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Rotation speed : 0 ~ 30 R.P.M

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Heating temperature : 250°C (Optional)  
Cooling temperature : 0°C (Optional)

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Substrate pneumatic shutter

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# Thermal Evaporator System (Solar cell)

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## Thermal Source



Power Supply : A.C or D.C Power

For Metal or Organic process

Thermal Source : 1 ~ 3 ea (Optional : Up to 4 ea)

Thermal Boat

For Al → PBN Boat (No broken , no reaction to Al)

For Organic → Crucible Heater & Crucible

Between Boat Isolation Shield Cover

Individual pneumatic source shutter

## Thickness Monitor



Thickness deposition monitor (Only rate display type)  
Optional : Deposition rate controller (Rate control type)

Rate Resolution (monitoring : 0.1Å/Sec)

Thickness sensor installation kit : 1 set

Co-deposition available (Optional)

(Metal + Metal, Metal + Organic, Organic + Organic)

## System Control

Manual type by control panel

Semi-auto type by touch screen

Auto type by P.C (By LCD Monitor)





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## Required Services

Main Power : 220V, 2 or 3 Phase, 30A

PCW (Water) : 2~3kgf/Cm<sub>2</sub>, ½" Swaglok fitting

Compressed Air : 5.5~6 Kgf/Cm<sub>2</sub>, ¼" Swaglok fitting

N2 Gas (Vent) : 1~2 Kgf/Cm<sub>2</sub>, ¼" Swaglok fitting

Exhaust : Ø40 Flexible Hose

## Remark

Chamber Ultimate Pressure : **Below than 3 x 10<sup>-7</sup>Torr**

Pumping speed : Below than 5 x 10<sup>-6</sup> Torr

**(Within 5 Minute, after sample loading)**

Film deposition Uniformity : Below than ±5%  
(Within 100mm x 100mm By α-step)

Provides operating & maintenance manual

Training

Warranty : 1 Year (Exclude consumables parts)

## Feature & Advantage



### High throughput time.

About take time **half-hour** for one batch process.  
(Include sample loading, pumping, deposition time)

### High speed vacuum pumping time.

(About 5 minute for reach 5 x 10<sup>-6</sup>Torr after sample loading)

### Small two chamber volume.

### Convenient to use

- Be very convenient for sample loading/ unloading.
- Be very convenient for source refill & boat replace.
- Be very convenient for chamber cleaning.
- Be very convenient for chamber inside shield replace.

# Thermal Evaporator System (Solar cell)

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### Feature & Advantage

#### Compact type (Small foot-print)

Glove box inside & outside

Control panel is glove box assembled type

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#### Continuously to use Al deposition without boat replace (PBN Boat, Optional)

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#### Safety

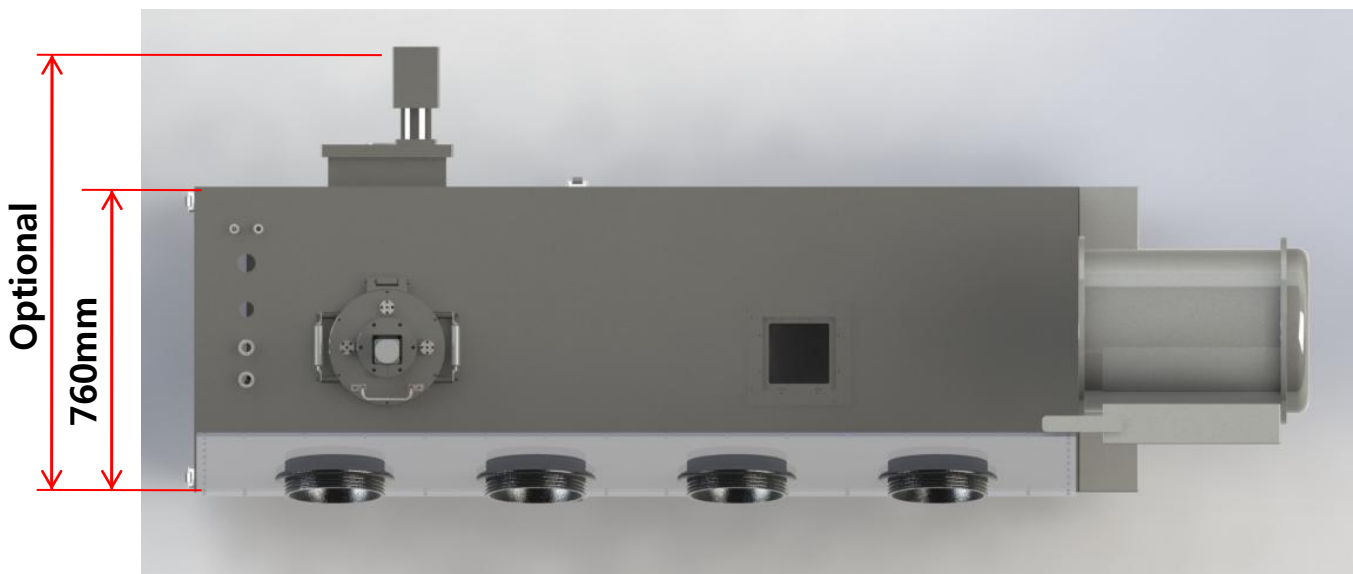
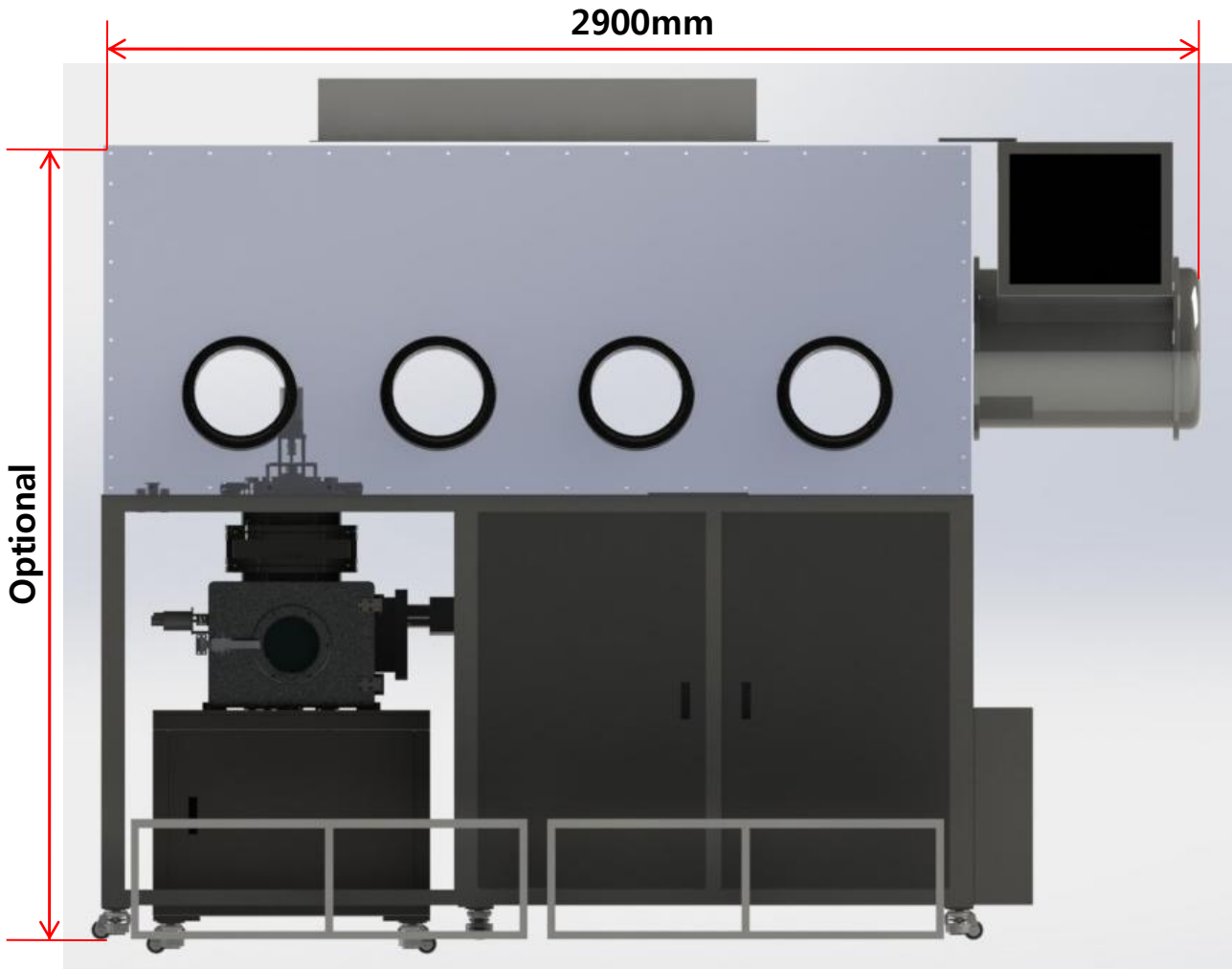
Electrical, vacuum, pumping, utility

Chamber lift, pump, valve, emergency, water, air, etc safety interlock

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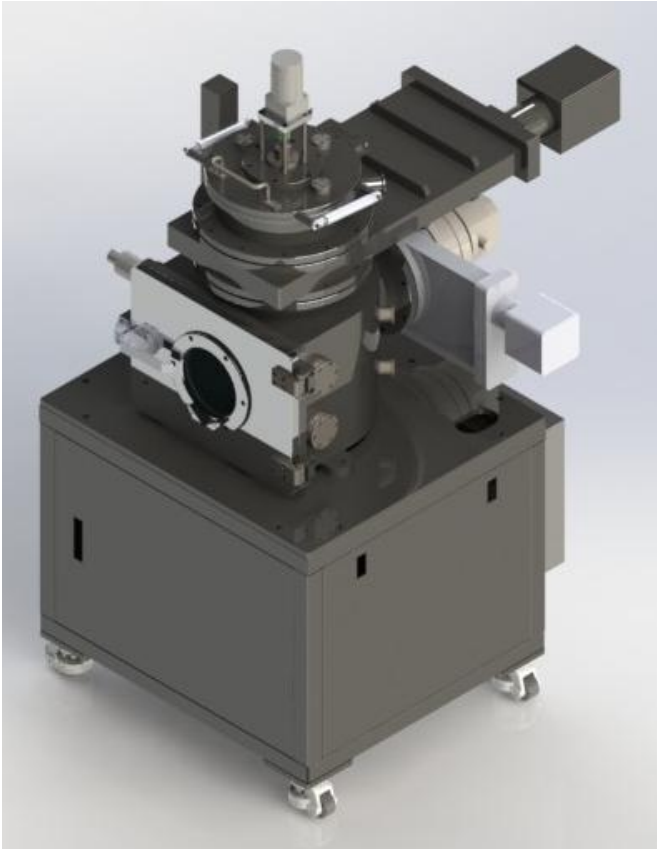
## System Layout



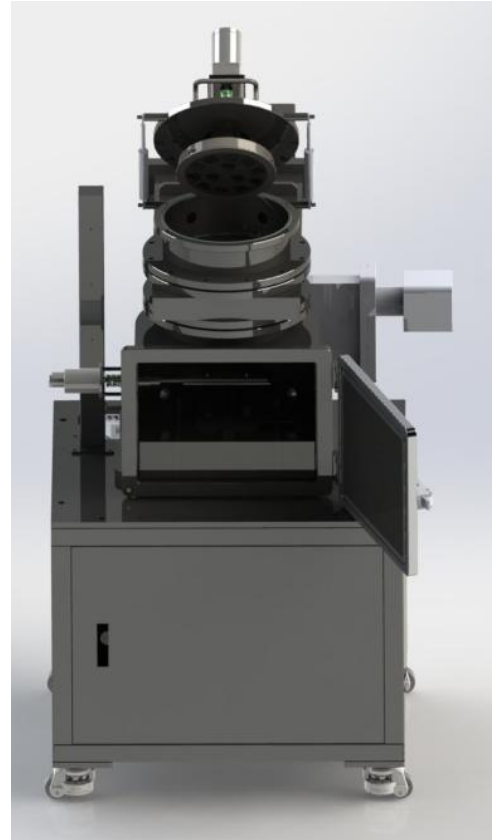
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## Chamber Detail



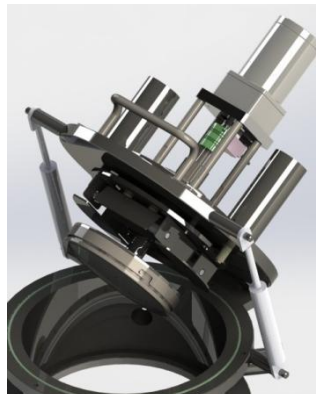
**Chamber Assembly**



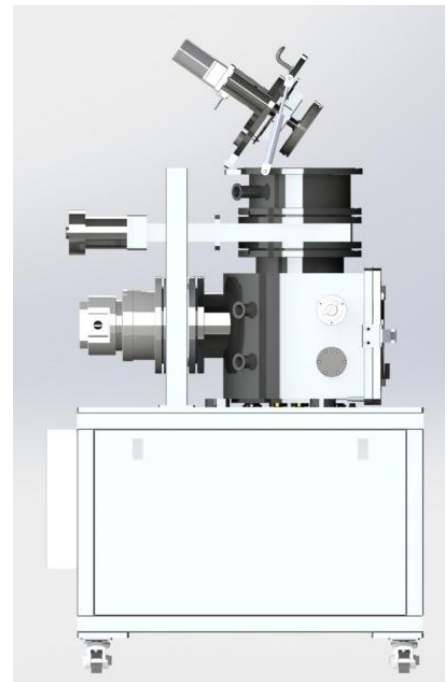
**Two door open**



**Substrate Heater**



**Substrate Rotator**



**Left side view**