

Configuration: Diffusion furnace, 8"
Process: PAD / Liner / ISO
Gases: N₂, NH₃, SiH₂Cl₂

Specifications:
Wafer size: 8", flat

Heater chamber:
Flat zone length: 850mm ± 0.5°C
Temperature uniformity: 500°C to 650°C, no gas BEC
Maximum power consumption: 29.1kW
Normal specified temperature range: 500 to 1050°C
Temperature control zone: 5 zone
Effective inner diameter: 370mm
Outer diameter: 511mm
Heater length: 1300mm
Heater element diameter: ø 3.5
Process application: PAD / Liner / ISO

Scavenger
Cooling water piping
Process vacuum line
Base plate
Clean unit:
Class 1: 0.1µm
Flow velocity and direction:
Carrier I/O port: 0.3m/sec down
Carrier stage: 0.25 m/sec sideways
Loading area: 0.25 m/sec sideways
Automation
Carrier I/O port
Boat elevator, boat rotation
Auto shutter
T-BAWL (wafer/carrier transfer):
Wafer transfer:
1 Wafer Fork + 4 Wafer Forks (Material - High Purity Al₂O₃ (99.5%))
Transfer Mechanism - Variable (5.2mm- 15mm Variable Pitch)
Fork Thickness (1.85mm)
Buffer stage: 21
Wafer counter: 2

Utilities:
Power: 208V, 3-phase, 67kW, heater chamber
UPS: 120V AC, 1-phase, 4kW, main controller
Gases: utility box
NH₃: 3 kg/cm³, 2 L/min, 1/4" UJR
N₂: 3 kg/cm³, 30 L/min, 1/4" UJR
SiH₂Cl₂: 2 kg/cm³, 0.2 L/min, 1/4" UJR
Air: 5 to 7 kg/cm³, 1/4" SWG

MFCs in utility box:
N₂: 20 L/min, process application, STEC
N₂: 0.2 L/min, process application, STEC
N₂: 10 L/min, process application, STEC
NH₃: 2 L/min, process application, STEC
SiH₂Cl₂: 0.2 L/min, process application, STEC

MFMs in utility box:
NH₃: 0.2 L/min, process application, STEC
SiH₂Cl₂: 0.2 L/min, process application, STEC

Exhaust:
Main body unit:
Scavenger exhaust: 3 m³/min, 4" lap joint, for thermal exhaust
Process exhaust: 0.1 m³/min, 3/8" VCR, for gas exhaust
Utility box:
Gas room exhaust: 1 m³/min, 2" lap joint, for general exhaust
Vacuum exhaust: JIS 100A flange, for pump exhaust

Cooling water:
Furnace unit: 5 Kg/cm²
Flow rate: 8 L/min
Connection method: 3/4" SWF
Used for: heater, flange, etc

Controller system:
Process controller: TEL waves front and back side
Wafer transfer mechanism controller
Model 570 temperature controller
Over temperature detector
Gas flow chart: front and back side
Pressure controller
Pump remote controller

Gas system:

Filter: MOTT Pou-20S-SV2, Ni
Air valve: FUJIKIN: diaphragm type, mega-mini and block
MFC: STEC SEC-74 series
Check valve: FUJIKIN O-ring seal type
Hand valve: FUJIKIN: diaphragm type
Regulator: VERIFLO SQ series
Pressure transducer: NAGANO ZT 17
Others:
Joint: gasket type: pure nickel type
Piping material: SUS316L up tube
Piping working method: welding
Welding methods: automatic welding

Gas exhaust system:
Dry pump: EBARA A150W-M
Main valve: MKS 172-1080P
Vacuum gauge: MKS baratron sensor, hot type
Joint: gasket and JIS method
Piping material: SUS316BA, stainless steel
APC: MKS 253B-3-80-2, butterfly valve
VG1: capacitance diaphragm gauge CMOH-01-150S06, 0 to 10 Torr, 150°C heating type
VG2: 0 to 1000 Torr, 150°C heating type
VG3: ULVAC GP-2A, Pirani gauge
P.SW: Pueron, over pressure detect

Manifold:
Structure:
Sealing method: end point sealing
Material: SUS316L stainless steel
Port:
Gas port: 3/8" ultra torr
Inner T/C port: 20DAI ultra torr
Exhaust port: 3: DIA
Cooling method: water cooling

Temperature measurement:
Spike TIC (dual one point)
Paddle TIC (5-zone, set-up in inside of out tube)
Over temp. detector TIC (single one point)

Safety interlock:
Gas flow low MFC: too low gas flow, alarm: > 5%, abort: $\pm 10\%$
Gas flow high MFC: too high gas flow, alarm: > 5%, abort: $\pm 10\%$
Low PCW flow: no PCW supply, alarm: > 3min, abort: > 5min, heater break down > 7min
PCW leak: PCW leak detection, alarm: yes
Process heater over temperature: chamber over heat, heater break down: > 3 sec
Furnace area over temperature: alarm: yes, heater break down > 3 sec
SCR area over temperature: alarm: yes, heater break down > 3 sec
Interruption of electric power: alarm: yes, abort < 3 sec, heater break down > 3 sec
Gas flow sequence: alarm: yes, abort: yes
Pump off: alarm: yes, abort: yes
Pump trouble: alarm: yes
Pressure low (reactor tube pressure): alarm: yes, abort: yes
Pressure high (reactor tube pressure): alarm: yes, abort: yes
Leak check (reactor tube pressure): main valve off delay 10min, abort > 20mTorr

Optional parts:
Signal tower (4 colors): SIF-V402 type
Error occurring:
Red: blinking
Orange: extinction
Green: extinction
Blue: extinction
Maintenance:
Red: light
Orange: extinction
Green: extinction
Blue: extinction
Power off:
Red: extinction
Orange: extinction
Green: extinction
Blue: extinction
Usually:
Red:
Orange: light: operator call, blinking: load / unload
Green: light: processing, blinking: idle
Blue: light: full-auto, blinking, semi-auto, extinction: manual

Step down transformer: 120V to 100V transition
Wafer leakage detector
Wafer detector on fork
Toxic gas detector
Cassette stage wafer protrude sensor
Dummy wafer pusher.