



# Company Introduction and Main Products

## ALLWIN21 CORP.

### Allwin21 Overview

**Allwin21 Corp.** is the exclusive licensed manufacturer of **AG Associates Heatpulse 610** Rapid Thermal Process tool. We are manufacturing the new AccuThermo AW Series Atmospheric and Vacuum Rapid Thermal Processors. Compared with traditional RTP systems, Allwin21's AccuThermo AW RTPs have innovative software and more advanced real time temperature control technologies to achieve the BEST rapid thermal processing performance (repeatability, uniformity, and stability) with decades of research directly applicable to ours.

We focus on extending product lifecycle, providing solutions, and engineering enhancements to many production proven semiconductor process equipment most directly related to III-V processing. These semiconductor equipment have been used in production and R&D since the 1990's. They have proven processes and research. Allwin21 Corp. can customize these systems with Allwin21's comparable integrated process control system with PC, solid robotic wafer transfer system, and new critical components. This is to achieve the goal of giving our customers a production edge, with right cost, and without having to worry about obsolete parts.

Allwin21 Corp. was formed in 2000 with a focus on professionally providing **Rapid Thermal Process, Plasma Asher Strip / Descum, Plasma Etch/RIE, Sputter Deposition** and **Metal Film Metrology** high-tech semiconductor equipment, services and technical support in Semiconductor III-V, MEMS, Biomedical, Nanotechnology, Solar, Battery & LED industries. We endeavor to be a leader in our product lines. To achieve this, we have been providing unique innovative and cost-effective technical solutions, high quality equipment, and on time spare parts delivery worldwide. We have maintained a global presence that has grown and expanded into the major high-tech manufacturing areas of the world. We pride ourselves on developing and continuing lasting customer relationships.

We understand that a timely responsive support and service are critical elements in semiconductor industries. Allwin21's experienced engineer team is the best guarantee for high quality service and support. We provide on-site installation, training, maintenance, system optimization, retrofits, and/or customized upgrades

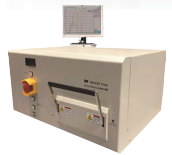
### What sets us apart from the competition...

- 1) Exclusive licensed manufacturer of Heatpulse 610 of AG Associates.
- 2) Advanced Allwin21 Real Time PC Control Technology.
- 3) Focus on Production-Proven process technology.
- 4) Integrated 3-axis solid robotic wafer transfer technology.
- 5) Experienced local engineer support.
- 6) Products made in U.S.A



#### 1) Rapid Thermal Process

- **AccuThermo AW 610M**
- AccuThermo AW 820M
- AccuThermo AW 820V
- **AccuThermo AW820R**



#### 2) Sputter Deposition

- **AccuSputter AW 4450**



#### 3) Plasma Asher Descum

- **AW-105R**
- AW-1008
- AW-B3000



#### 4) Plasma Etch/RIE

- AW-901eR
- AW-903eR
- AW-2001R

#### 5) Upgraded Kit for:

- Heatpulse® 210,310,410,610
- Matrix® X0X
- Tegal® 90Xe
- Gasonics® Aura 1000/2000LL/3000/3010
- Gasonics® AE 2001/2000LL
- Gasonics® L3510/L3500
- Perkin-Elmer 24XX,4XXX Sputter
- MRC 6XX, 9XX Sputter
- TES 6XX,9XX Sputter
- Branson/IPC® 3000/2000/4000
- Lam AutoEtch® 490/590/69
- Lam Rainbow® 4XXX Series



#### 6) Sheet Resistance Measurement

- AWgage-150
- AWgage-200



# W Rapid Thermal Process ALLWIN21 CORP.

## Introduction

The AccuThermo AW Series RTPs were derived from the AG Associates 610 production-proven design. Allwin21 Corp. is the *exclusive* manufacturer of the AG Associates Heatpulse 610 desktop atmospheric RTP (Rapid Thermal Processing) system. The system uses high intensity visible radiation to heat single wafer for short process periods of time at precisely controlled temperatures. The process periods are typically 1-600 seconds in duration, although periods of up to 9999 seconds can be selected. These capabilities, combined with the heating chamber's cold-wall design and superior heating uniformity, provide significant advantages over conventional furnace processing.

## AccuThermo AW Series RTPs Key Features

- ⊕ 40 years' production-proven Real RTP/RTA/RTO/RTN system.
- ⊕ Scattered IR light by special gold plated Al chamber surface.
- ⊕ Allwin21 advanced Software package with real time control technologies and many useful functions.
- ⊕ Precise and Rapid Control technology. 0.1millisecond Control.
- ⊕ 0.02" Diameter "K" Type Thermocouple(Bare, Beaded) for 150-840 °C temperature with 0.25 second response time.
- ⊕ Patented Non-contact ERP Pyrometer for >400°C temperature with much better performance and convenience. This is optional.
- ⊕ Easy Allwin21 Pyrometer Calibration method.
- ⊕ Consistent wafer-to-wafer process cycle repeatability.
- ⊕ Advanced PID Control Technology with Fuzzy Logic Learn capability and Chamber Thermal Data.
- ⊕ Top and bottom High-intensity visible radiation Tungsten halogen lamp heating for fast heating rates with good repeatability, performance and long lamp lifetime (up to 2400 power on hours).
- ⊕ Cooling N2 (Or CDA) flows around the lamps and quartz isolation tube for fast cooling rates.
- ⊕ Isolated quartz tube, thickness 0.125" only for low thermal budget.
- ⊕ PowerSum function to save valuable compound material wafers.
- ⊕ Up to six gas lines with MFCs and shut-off valves
- ⊕ Energy efficient.
- ⊕ Made in U.S.A.
- ⊕ Small footprint.

## Typical Application Areas:

- Chip manufacture
- Compound industry: GaAs, GaN, GaP, GaInP, InP, SiC, III-V, II-VI
- Optronics, Planar optical waveguides, Lasers
- Nanotechnology
- Biomedical
- Battery
- MEMS
- Solar
- LED

## Models

- ◆ AccuThermo AW 610M
- ◆ AccuThermo AW 820M
- ◆ AccuThermo AW 820V

## AccuThermo AW RTPs Software Key Features

- Integrated process control system
- Real time graphics display
- Real time process data acquisition, display, and analysis
- Programmed comprehensive calibration and diagnostic functions
- Closed-loop temperature control with temperature sensing.
- Precise time-temperature profiles tailored to suit specific process requirements.
- Faster, easier Programmable comprehensive calibration of all subsystems, leading to enhanced process results.
- A recipe editor to create and edit recipes to fully automate the processing of wafers inside the AccuThermo RTP
- Validation of the recipe so improper control sequences will be revealed.
- Storage of multiple recipes, process data and calibration files so that process and calibration results can be maintained and compared over time.
- Passwords provide security for the system, recipe editing, diagnostics, calibration and setup functions.
- Simple and easy to use menu screen which allow a process cycle to be easily defined and executed.
- Troubleshooting feature which allows engineers and service personnel to activate individual subassemblies and functions. More I/O, AD/DA "exposure".
- Use PowerSum technology to detect the process and increase Yield.
- Watchdog function: If this board loses communication with the control software, it will shut down all processes and halt the system until communication is restored.
- GEM/SECS II function (Optional).

## Typical Applications

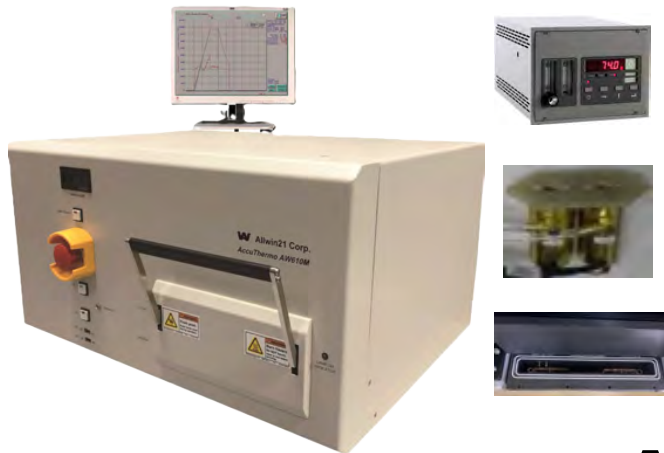
- Contact alloying
- Nitridation of metals
- Oxygen-donor annihilation
- Other heat treatment process
- Silicon-dielectric growth
- Implant annealing
- Glass reflow
- Silicides formation and annealing





# Rapid Thermal Process

## ALLWIN21 CORP.



# AccuThermo AW 610M

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### AccuThermo AW 610M Specifications

- ❖ Wafer sizes: Small pieces, 2", 3", 4", 5", 6" wafer capability
- ❖ Recommended ramp up rate: Programmable, 10°C to 120°C per second. Maximum Rate: 200°C (NOT RECOMMENDED)
- ❖ Recommended steady state duration: 0-300 seconds per step.
- ❖ Ramp down rate: Non-programmable, 10°C to 200°C per second.
- ❖ Recommended steady state temperature range: 150°C - 1150°C. Maximum 1250°C (NOT RECOMMENDED)
- ❖ **ERP Pyrometer** 400-1250°C with ±1°C accuracy when calibrated against an instrumented thermocouple wafer.
- ❖ Thermocouple 150-840°C with ±0.5°C accuracy & rapid response.
- ❖ Temperature repeatability: ±0.5°C or better at 1150°C wafer-to-wafer. (Repetition specifications are based on a 100-wafer set.)
- ❖ Temperature uniformity: ±5°C across a 6" (150 mm) wafer at 1150°C. (This is a one sigma deviation 100 angstrom oxide.) For a titanium silicide process, no more than 4% increase in non-uniformity during the first anneal at 650°C to 700°C.
- ❖ Process/Purge gas inputs: Any inert and/or non-toxic gas regulated to 30 PSIG and pre-filtered to 1 micron. Typically, N<sub>2</sub>, O<sub>2</sub>, Ar, He, forming gas, NH<sub>3</sub>, N<sub>2</sub>O<sub>2</sub> are used.

### Options

- ◆ Multiple Process Gases (Up to 6) and MFCs with shut-off valve for each line.
- ◆ Carrier or Susceptor for small sample, transparent substrate and substrate with metal thin film on top.
- ◆ Patented ERP Pyrometer (400-1250°C) as non-contact high temperature sensor.
- ◆ Chiller for ERP Pyrometer
- ◆ 2-inch, 4-inch, 6-inch TC Wafer, Single Point for Pyrometer calibration

### AccuThermo AW 610M Configuration

- AccuThermo AW 610M Main Frame with wires.
- Power Type: Three Phase, worldwide power (50/60 Hz) .
- **Cooling Air Control. SSR Lamp Control.CE Mark** if Necessary
- Pentium® class computer with a 17-inch LCD monitor and Allwin21 Corp proprietary software package.
- **New type water sensor** which is more reliable.
- Aluminum oven chamber with water cooling passages and gold plating plates. **24V valves** for cooling air and water.
- Door plate with 2 of TC connection ports.
- **Isolated Quartz Tube** W/O Pyrometer window or with Pyrometer Window.
- Oven control board and one main control board.
- Bottom and top heating with 21 (1.2KW ea) Radiation heating lamp module with **6 bank zones**(Top:3/4/3, Bottom:4/3/4) for sensitive applications.
- Quartz Tray for 4 to 6 inch round wafer or customized.
- **6 Gas lines** with up to 1 of MFC with shut-off valve.
- T-Shape Quartz with qualified **K-Type TC** and one set holder for 150-840°C temperature measurement.
- Package of 5 pieces of thermocouple wires as spare TC
- USB with original Software backup.
- ◆ Temperature Meter for Pyrometer and Thermocouple calibration
- ◆ Shut-off valve for Quartz Tube & Lamps cooling control
- ◆ Spare Parts
- ◆ Quartz Liner and quartz Tube with Liner Support
- ◆ SST chamber instead of Al chamber
- ◆ Special TC assembly with SiC cap for up to 1100 °C, low cost.
- ◆ **Double O Ring, O2 Sensor/Analyzer** for production.

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# W Rapid Thermal Process

## ALLWIN21 CORP.



## AccuThermo AW 820M

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### AccuThermo AW 820M Specifications

- ❖ Wafer sizes: Small pieces, 2", 3", 4", 5", 6", 8" wafer capability
- ❖ Recommended ramp up rate: Programmable, 10°C to 120°C per second. Maximum Rate: 200°C (NOT RECOMMENDED)
- ❖ Recommended steady state duration: 0-600 seconds per step.
- ❖ Ramp down rate: Non-programmable, 10°C to 200°C per second.
- ❖ Recommended steady state temperature range: 150°C - 1150°C. Maximum 1250°C, 1500°C (Not recommended) is optional.
- ❖ **ERP Pyrometer** 400-1250°C with  $\pm 1^\circ\text{C}$  accuracy when calibrated against an instrumented thermocouple wafer. 1500°C is optional.
- ❖ Thermocouple 150-840°C with  $\pm 0.5^\circ\text{C}$  accuracy & rapid response.
- ❖ Temperature repeatability:  $\pm 0.5^\circ\text{C}$  or better at 1150°C wafer-to-wafer. (Repetition specifications are based on a 100-wafer set.)
- ❖ Temperature uniformity:  $\pm 8^\circ\text{C}$  across an 8" (200 mm) wafer at 1150°C. (This is a one sigma deviation 100 angstrom oxide.) For a titanium silicide process, no more than 6% increase in non-uniformity during the first anneal at 650°C to 700°C.
- ❖ Process/Purge gas inputs: Any inert and/or non-toxic gas regulated to 30 PSIG and pre-filtered to 1 micron. Typically, N<sub>2</sub>, O<sub>2</sub>, Ar, He, forming gas,

### Options

- ◆ Multiple Process Gases (Up to 6) and MFCs with shut-off valve for each line.
- ◆ Carrier or Susceptor for small sample, transparent substrate and substrate with metal thin film on top.
- ◆ Patented ERP Pyrometer (400-1250°C) as non-contact high temperature sensor. 1500°C (NOT RECOMMENDED) is optional.
- ◆ Chiller for ERP Pyrometer

### AccuThermo AW 820M Configuration

- AccuThermo AW 820 Main Frame with wires.
- Power Type: Three Phase, worldwide power (50/60 Hz).
- **Cooling Air Control. SSR Lamp Control. CE Mark** if Necessary
- Pentium® class computer with a 15-inch touch screen monitor and Allwin21 Corp proprietary software package.
- **New type water sensor** which is more reliable.
- Aluminum oven chamber with water cooling passages and gold plating plates.
- Door plate with one TC connection port.
- **Isolated Quartz Tube** W/O Pyrometer window or with Pyrometer Window.
- Oven control board and one main control board.
- Bottom and top heating with 27 (1.2KW ea) Radiation heating lamp module with **10 bank zones** (Top:2/3/4/3/2, Bottom:2/3/3/3/2).
- Quartz Tray for 5 to 8 inch round wafer or customized.
- **6 Gas lines** with one Gas MFC with shut-off valve.
- T-Shape Quartz with qualified K-Type TC and one set holder for 150-840°C temperature measurement.
- Package of 5 pieces of thermocouple wires as spare TC.
- USB with original Software backup.
- ◆ 2-inch, 4-inch, 6-inch, 8-inch (Not recommended) TC Wafer, Single Point for Pyrometer calibration
- ◆ Temperature Meter for Pyrometer and Thermocouple calibration
- ◆ Shut-off valve for Quartz Tube&Lamps cooling control
- ◆ Spare Parts
- ◆ **Double O Ring, O<sub>2</sub> Sensor/Analyzer** for production.

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# Rapid Thermal Process

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# AccuThermo AW 820V (Not Recommended)

### AccuThermo AW 820V Specifications

- ❖ Wafer sizes: Small pieces, 2", 3", 4", 5", 6", 8" wafer capability
- ❖ Vacuum Pressure: 50mTorr to 13 Torr or 13 Torr to 760 Torr
- ❖ Recommended ramp up rate: Programmable, 10°C to 120°C per second. Maximum Rate: 200°C (NOT RECOMMENDED)
- ❖ Recommended steady state duration: 0-600 seconds per step.
- ❖ Ramp down rate: Non-programmable, 10°C to 200°C per second.
- ❖ Recommended steady state temperature range: 150°C - 1150°C. Maxim 1250°C ,1500°C (Not recommended) is optional.
- ❖ Special quick response K-Type TC temperature accuracy: ±1°C, when calibrated against an instrumented thermocouple wafer.
- ❖ Thermocouple temperature accuracy: ±0.5°C with rapid response.
- ❖ Temperature repeatability: ±0.5°C or better at 1150°C wafer-to-wafer. (Repetition specifications are based on a 100-wafer set.)
- ❖ Temperature uniformity: ±8°C across a 8" (200 mm) wafer at 1150°C. (This is a one sigma deviation 100 angstrom oxide.) For a titanium silicide process, no more than 6% increase in non-uniformity during the first anneal at 650°C to 700°C.
- ❖ Process/Purge gas inputs: Any inert and/or non-toxic gas regulated to 30 PSIG and pre-filtered to 1 micron. Typically, N<sub>2</sub>, O<sub>2</sub>, Ar, He, forming gas, NH<sub>3</sub>, N<sub>2</sub>O<sub>2</sub> are used.

### Options

- ◆ Atmospheric process function.
- ◆ Vacuum pressure measurement and control function
- ◆ Turbo pump for up to 10-6 Torr (NOT RECOMMENDED)
- ◆ Mechanical vacuum pump\*
- ◆ Dry vacuum pump\*
- ◆ Multiple Process Gases and MFCs (Up to 5) with Gas Control Board if necessary.

### AccuThermo AW 820V Configuration

- AccuThermo AW 820V Main Frame with wires.
- Power Type: Three Phase, worldwide power (50/60 Hz)
- CE Mark if Necessary
- Pentium® class computer with a 15-inch touch screen monitor and Allwin21 Corp proprietary software package.
- Mouse and standard keyboard.
- Aluminum oven chamber with water cooling passages.
- Door plate with one TC connection port.
- Top and bottom quartz windows and heating module with 27 (1.2KW ea) Radiation lamps with 10 bank zones (Top:2/3/4/3/2, Bottom:2/3/3/3/2 ).
- Oven control board and one main control board.
- Quartz Tray for 5 to 8 inch round wafer or customized.
- Two gas lines with one Gas MFC with shut-off valve.
- USB with original Software backup.
- Main Vacuum Valve

- ◆ Special quick response K-Type TC assembly for high temperature
- ◆ Carrier or Susceptor for small sample, transparent substrate and substrate with metal thin film on top.
- ◆ Maximum 1500 °C (Not recommended) with special TC assembly.
- ◆ Shutt-off valve for Quartz Tube&Lamps cooling control
- ◆ Temperature Meter Thermocouple calibration
- ◆ Spare Parts

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