



P7000 ALLOY TRACK SYSTEM

Low Cost and High Throughput Alloying

Benefits

- Closed chamber inert atmosphere capability – eliminating need for Rapid Thermal Annealing (RTA)
- Capable of using multiple gases with pump out capability
- Proximity pins for uniform heating and reduced backside contamination
- Gentle wafer cooling and handling
- High throughput at a fraction of the cost of a Rapid Thermal Annealer (RTA)
- Up to 500°C thermal process capability

Features

- Process 50 mm – 200 mm wafers
- PC Windows-based operating system with smartPro GUI or card cage
- Dual-size bridging without hardware changeover
- CE Mark

Options

- SECS/GEM compliance
- Contact C&D for more options
- Barcode and recipe download

Description

Metal ohmic alloying is unique to the compound semiconductor industry and is therefore often ignored by major equipment manufacturers. The process is carried out on platforms that were not originally designed for alloying. There are two equipment choices for metal alloy – a relatively expensive Rapid Thermal Annealing (RTA) or a C&D P7000 Alloy Track System that meets the specific needs of metal ohmic alloying. The P7000 is primarily designed for the processing of 50 mm - 200 mm GaAs and InP wafers but it can also be used for high temperature silicon processing. It features engineering simplicity and ease of use. It is a cost-effective alternative to the expensive RTA, offering roughly twice as much throughput.



Model P7000



Controlled environment - gentle cooling

RTAs offer a controlled environment through the use of gases and uniform temperature ramping. C&D's smartPro P7000 Alloy System was designed to imitate these features. A lid is lowered over the hotplate during processing which prevents airflow from affecting the alloy and allows for process gases to enter the system. A choice of gases and two methods of entry into the chamber are available.

Temperature ramping is achieved by varying the wafer up-down moving speed, which controls the wafer-to-hotplate distance. The wafer is placed on three pins that can be programmed to raise and lower at a specified rate. This helps to reduce wafers from warping.

For controlled wafer cooling, an adjustable flow of nitrogen is applied for a variable amount of time. This ensures that the wafer is cool enough before being transferred to the chill plate and then to the receive cassette.

The approximate cooling time from process temperature to when the arm is able to retrieve the wafer from the process chamber is less than 60 seconds.

High throughput -parallel processing

The P7000 Alloy System offers increased throughput over the RTA making it an attractive option.

A typical RTA has a throughput of 10 wafers per hour while the P7000 Alloy System can process 19 wafers per hour in serial mode and 23 wafers per hour in a parallel mode on one track.

P7000 Technical Data

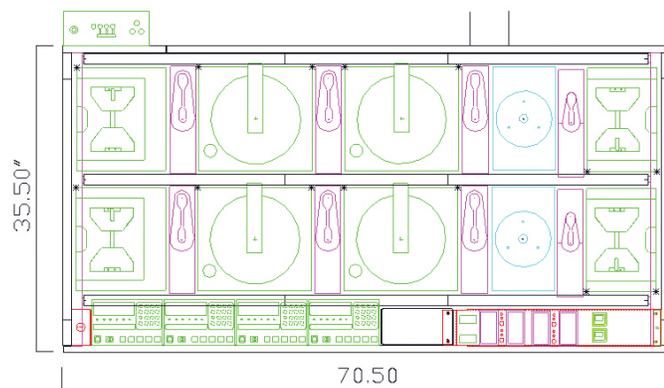
Available modules	Alloy and chill plate
Wafer size	50 mm - 200 mm wafers
Transfer Method	Automatic transfer arm with improved design maintaining end-point placement to within ± 0.1 mm over 300,000 wafers.
User Interface	Windows-based operating system with smartPro GUI or cardcage
Transfer Mode	Serial transport
Indexer	SEMI standard H configuration



Gentle Handling

The P7000 Alloy System has a simple and reliable design that has been used for many years in the industry

- Wafers can be processed in an ambient or an open-air environment which allows for a wide range of applications.
- The wafer never contacts the surface of the hotplate to prevent backside contamination.



System depicts a two-track P7000 Alloy Track. System dimensions vary depending upon configuration.

Conclusion

The basis for good alloy uniformity is the hotplate heating characteristics. A center to edge surface temperature gradient of 3% and 1.24% for an open air and controlled ambient alloying respectively ensures that the contact resistance across the wafer will be uniform. The within wafer non-uniformity value is confirmed by the sheet resistance variance of 1.4% which is accounted for by the alloy process and is well within acceptable limits. The P7000 Alloy System is easy to use and offers a simplistic means of obtaining high quality, uniform ohmic contacts.

Furthermore, the improved throughput and lower cost make this a very attractive alternative to the high-end RTAs normally employed for the ohmic alloy process.