Nitrogen Applications

GENERON INNOVATIVE GAS SYSTEMS

Electronics: Wave Soldering

Wave soldering is a process by which electronic components are soldered to a printed circuit board (PCB) to form an electronic assembly. The board is conveyed over a flux station, then preheated and finally passed over a "wave of solder". The process uses a tank to hold a quantity of molten solder; the components are inserted into or placed on the PCB and the loaded PCB is passed across a pumped wave or waterfall of solder. Nitrogen is used to provide an inert atmosphere over the wave of molten solder excluding O_2 from the process.

The use of Nitrogen as a protective atmosphere in the wave soldering process has become a widely accepted practice by circuit board assemblers and packagers. Nitrogen has shown a significant improvement in results for the wave soldering process and its benefits have been proven many times over.

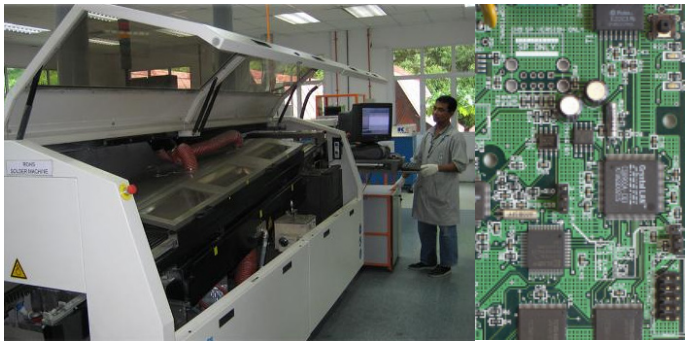
Circuit Board Assemblers must establish a process that reduces cost, increases productivity and improves product quality. The use of Nitrogen has proven to do just that.

Cost reduction is driven by the cost of Nitrogen, the cost of dross and the cost of defects.

The cost of nitrogen generated on-site verses the cost of a liquid nitrogen system has been proven time and time again to show a reduction in nitrogen cost on a per cubic foot basis.

What Nitrogen purity to Use?

Many Nitrogen wave soldering systems throughout the world have been using hot gas knives and soldering in 95% nitrogen with little adverse effects of the gas purity compared to the use of higher purity gas delivered from liquid nitrogen systems and gas cylinders.



Solderability differences between 97% and 99.999% nitrogen purity are marginal in wave soldering and therefore purity becomes a cost issue as weighted against the cost of dross and cost of defects.

Typical wave soldering applications are accomplished with purity requirements below 1000 PPM O_2 (nitrogen purities above 99.9%). These applications are perfectly suited for Nitrogen Membrane Generators.

For applications that require higher purity atmospheres ‹ 500 PPM O_2 (nitrogen purities greater than 99.95%) to 10 PPM (99.999%) PSA Nitrogen Generators are recommended.

Benefits of Using Nitrogen

- Decreases Solder Dross Formation.
- Decreases Solder Consumption.
- Decreased Operating Cost.
- Less equipment cleaning and maintenance.
- Reduced operator exposure to toxic volatiles.
- More flexibility in board design.
- Optimum, no-clean wave soldering process.
- Reduces defects, maintenance and process variability.
- Wider process window/increased uptime.

Generon IGS Nitrogen Generators

Generon IGS is in the unique position to be able to supply competing air separation processes utilizing either hollow fiber membrane or PSA (Pressure Swing Adsorption) technologies to provide our customers with the best technical solution for their application.

NITROSWING® Modular PSA Generators

- 8 Models to choose from ranging in size from 84 SCFH (2.2 Nm^3H) to 4,300 SCFH (112.8 Nm^3H) depending on desired purity and pressure.
- Nitrogen purities to 99.9995%.
- Product Dew Point to -70°F (-57°C).
- Delivery pressures to 120 psig (8.3 barG).

NITROSWING® Twin-Tower PSA Generators

- Generon IGS manufactures more than 30 models ranging in size from 324 SCFH to 262,300 SCFH (9.0 Nm^3H to 7,400 Nm^3H) depending on desired purity and pressure.
- Nitrogen purities to 99.999%.
- Product Dew Point to -70°F (-57°C).
- Delivery pressures to 130 psig (9 barG).

Nitrogen Membrane Generators

- Nitrogen purities adjustable from 95% to 99.9%.
- Product Dew Point to -70°F (-57°C).
- Extensive product range from the smallest module producing 25 scfh (.7 Nm^3/h) to large integrated systems producing 187,000 scfh (4,915 Nm^3/h).
- Modular design allows for various combinations with the flexibility and customization from a single membrane module to multiple Integrated Systems resulting in easy installation and fast start-up times.
- Product pressures available in two standards: 200 psig (14 barG) and 330 psig (23 barG)

A full installation is typically comprised of an air compressor, air dryer, filtration package, air receiver tank, nitrogen generator, and a nitrogen buffer tank.

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With a Generon IGS Nitrogen Generator you can:

- Eliminate high cost purchased gases.
- Eliminate delivery & fuel sur-charges.
- Eliminate rental and handling charges.
- Eliminate evaporation losses.
- Eliminate long term contacts.
- Eliminate truck and forklift traffic in your plant.
- Eliminate run outs.
- Lower your operating cost with a **Generon IGS** nitrogen generating system.