Nitrogen Applications

GENERON INNOVATIVE GAS SYSTEMS

Electronics: Reflow Soldering

Reflow soldering is the most common method of attaching surface mounted components to a printed circuit board (PCB). The PCB moves through the reflow-oven on a conveyor belt, and is subjected to a controlled atmosphere and a time-temperature profile.

In the conventional reflow soldering process, there are usually four stages, called "zones", each having a distinct thermal profile: preheat, thermal soak, reflow (peak), and cooling.

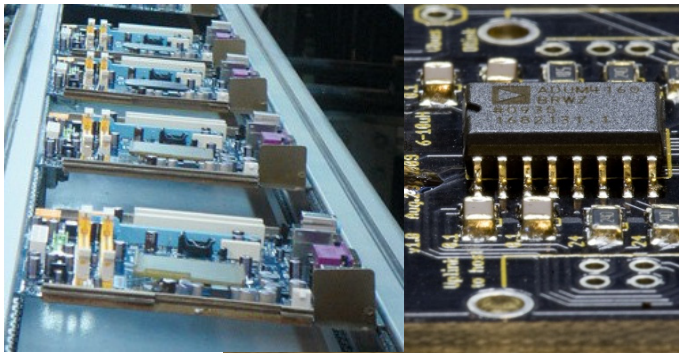
The goal of the reflow process is to heat the solder paste, which melts the solder, permanently connecting the joint. Heating may also be achieved under an infrared lamp or by soldering individual joints with a hot air pencil.

Circuit Board Assemblers must establish a process that reduces cost, increases productivity and improves product quality. In considering the use of nitrogen in the reflow soldering process, some of the most important factors are defect levels and reliability of the joint. It has been proven many times over that, both of these factors are positively affected by the use of nitrogen.

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?

The oxygen level of the atmosphere in the reflow oven varies according to zone with the hottest (reflow/peak) zone requiring the lowest level of oxygen. The purity of nitrogen required varies from equipment manufacturer to manufacturer and by the thermal profile for any particular assembly.



Since most nitrogen reflow ovens today are designed for lower residual oxygen levels (ROL) at consumption rates of less than 1500 schf (40 m^3/h) it is common to operate the peak zone with oxygen levels from 100-200 ppm.

For Reflow applications with purity requirements below 1000 PPM O2 (nitrogen purities above 99.9%), Nitrogen Membrane Generators are perfectly acceptable.

For applications that require higher purity atmospheres ‹ 500 PPM O2 (nitrogen purities greater than 99.95%) to 10 PPM (99.999%) PSA Nitrogen Generators are recommended.

Benefits of Using Nitrogen

- Greatly reduces defect levels as compared to soldering in air.
- Reduce board discoloration
- Improve joint integrity and strength .
- Decreased Operating Cost.
- Improve wettability of surface mount component leads.
- Improve first pass soldering yields.
- Reduce formation of white haze from tin/rosin flux oxidation.
- 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.