

## Production of Silicon Wafers for Semi-Conductors

**Focus:**

For over 50 years, this company has been manufacturing semi-conductors and integrated power solutions for systems that demand high performance and reliability. Customers in aerospace, defense, and space rely on its innovative products to develop smaller, lighter weight, higher efficiency solutions.

**Problem:**

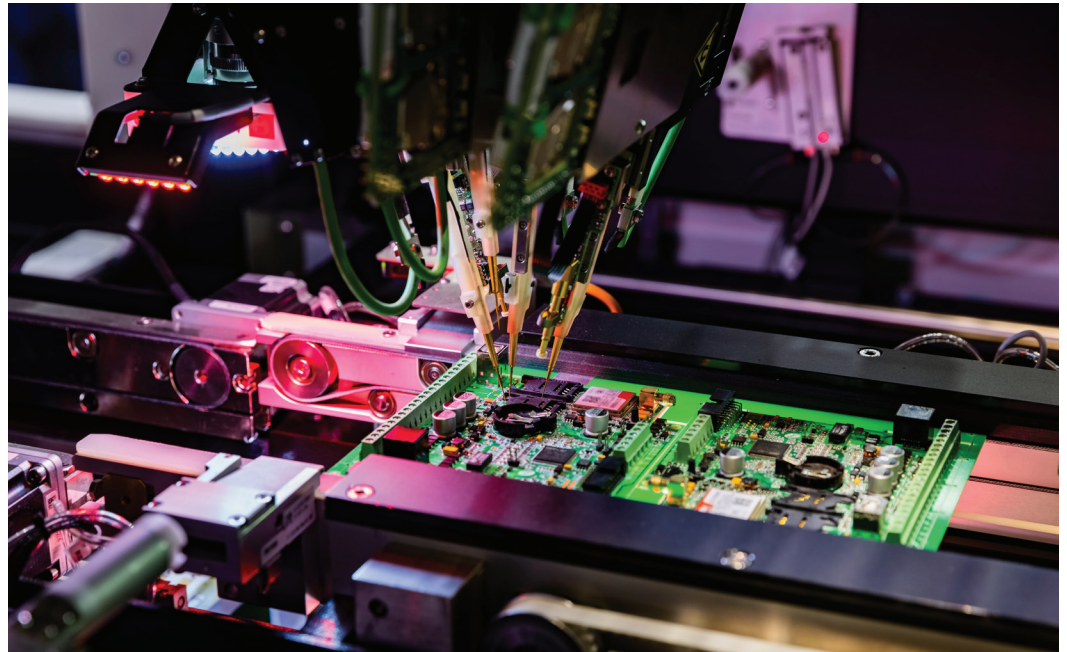
The customer was in the process of expanding to a larger facility and required additional nitrogen for their process.

**Solution:**

A system was installed at the manufacturer's facility that included a Parker nitrogen gas generator, air storage tank, and refrigerated air dryer with filtration was sized to meet the needs of the plant expansion.

**Impact:**

After completing their plant expansion and upgrading their facility with an on-site nitrogen generator, the customer was able to meet its nitrogen needs without relying on a 3rd party gas supplier. As a result of their nitrogen generator purchase, the company has reduced their annual nitrogen costs and protected the environment with reduced emissions from on-site generation.



**Project Name:** Production of Silicon Wafers for Semi-Conductors  
**Location:** West Palm Beach, Florida

**Summary**

In 2021, the manufacturer began looking into an on-site nitrogen generation system for their plant expansion. In addition to moving away from bulk nitrogen, the plant expansion would require additional consumption of nitrogen compared to their previous design.

**Challenge**

For many years, the customer turned to a gas supplier to provide nitrogen for their production of silicon wafers. Nitrogen can be more expensive when delivered because gas companies typically charge higher fees than what it would cost to generate nitrogen on-site. They were interested in switching to a nitrogen generator, but needed assistance selecting the proper generator for their process.

**Solution**

Working with Parker distributor, a complete nitrogen generation system was designed and sized to match the demand this plant expansion would require. After the review of a complete cost analysis on payback and value, a package including a nitrogen generator, air storage tank, and refrigerated air dryer with filtration was chosen. Generating nitrogen on-site can increase profitability by only paying for what is used, increase reliability by having nitrogen available on demand, and increases sustainability with short payback and long service life. The customer ultimately realized energy savings and significantly reduced its carbon footprint with the installation of the Parker nitrogen generator that was equipped with standby-mode energy savings technology.

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### Dual-Bed (DB) Series Twin Tower PSA Nitrogen Gas Generation Systems

Parker's DB Series is a range of industrial twin tower PSA nitrogen generators that take a supply of compressed air and deliver nitrogen with purities up to 99.999% at dewpoints down to -58°F (-50°C). These full-feature generators are the ideal choice for applications that require medium to high nitrogen purity at high flow rates.

#### Advantages

- Robust, skid mounted twin tower design for high-flow industrial applications.
- Continuous, on-demand supply of nitrogen with purities ranging from 95 to 99.999%.
- High efficiency pre-filtration removes inlet air particles down to 0.1 micron.
- SS sterile air final filter provides outlet filtration efficiency of 99.9999+% at 0.01um and has full compliance with FDA and USDA requirements.
- Allen Bradley® PLC controls with 4-line LCD display.



- Includes nitrogen flow meter, outlet pressure regulator, nitrogen buffer tank and an ox and requires no calibration.
- Purity can be easily adjusted and set on-site.
- Stand-by mode saves energy during periods of low demand.
- Improves safety, reliability, and lowers operating costs versus traditional cylinder or liquid nitrogen gas supplies.

### StarlettePlus-E Refrigeration Dryers SPS 10 - 250

Designed with environmentally friendly, low Global Warming Potential (GWP) refrigerant gas, R513A, Parker's SPS Series Refrigeration Dryers are the best choice for quality, performance and the environment.

#### Advantages

- Developed around a state-of-the-art aluminum heat exchanger (E-Pack) with a patent pending all-in-one design.
- The E-Pack design utilizes low pressure drop, cross-flow heat exchangers to reduce operational costs.
- All models are ETL listed.
- The E-Pack heat exchanger is designed with a large air/air heat exchanger to pre-cool the incoming hot, saturated compressed air and therefore reduce energy consumption.
- The E-Pack design yields a refrigeration circuit that uses a smaller volume of refrigerant than other comparable dryers and offers one of the lowest absorbed powers in the industry.
- All models are equipped as standard with a digital controller that includes an indication of compressed air temperature, volt free alarm contact, service reminder and integral timed drain control.

