THE MONTY: HEAT TREAT NEWS

The Latest Heat Treat News From Around The Globe Since 1999

January 2, 2020

Scott Bodemann and Paul Cairney, South-Tek Systems Interview

We are pleased to be able to offer you this interview with both Mr. Scott Bodemann, President and Mr. Paul Cairney, Heat Treat market manager, of Nitrogen Generation Technology company South-Tek Systems of Wilmington, NC, USA.

I always like to start off our interviews with a bit of background. For instance, what is your background and how did you get involved with nitrogen generating systems?

***Scott**: "Thanks Gord and great to chat with you. I have been with South-Tek for over 15 years and have enjoyed being a part of the Company's expansion over the years. We were established in 1997 and our sole focus is on the design and manufacturing of nitrogen (N_2) generators. Our USA based engineering/manufacturing headquarters is located in Wilmington, NC. Our systems range in size from the dimensions of a small briefcase (1 LPM) on up to flow rates exceeding 30,000+ SCFH. In addition, nitrogen purities range from 95% on up to 99.999% (10 ppm) and pressures can exceed 6,000 PSI.*

We supply nitrogen generators into a multitude of markets; Fire Protection Systems (FPS), Food Packaging, Food Storage, Medical, Automotive, Heat Treating, Laser, Electronics, 3D Printing, University, Military, Corrosion Control (Power Plant and FPS), Laboratory, Food Service, Pharmaceutical, Chemical, R&D & Materials. Customers include those as large as Fortune 100 Companies to small privately-run business, all of which realize significant savings over purchasing nitrogen from gas companies. Our technology allows them to control their costs long into the future."

The focus of "The Monty" is very narrow; heat treating only so we will frame all of our questions around the field of heat treatment. First off why? Why buy a nitrogen generating system when it is so simple to go out and lease a bulk nitrogen storage tank?

Paul: *"There are a multitude of compelling reasons to invest in a nitrogen generation system with STS. 2 main reasons are:*

COST
CONTROL

COST - The cost of buying bulk gas and the added expense of delivery, tank rental, hazmat fees etc. are essentially eliminated with your own nitrogen generation system. The average cost of buying liquid bulk is around $1.00 per CCF and the cost of generating your own with a South-Tek Systems generator is around 10 cents per CCF. And, with the gas company, you are paying for nitrogen that you do not fully get to use due to daily/weekly vent off. This vent off can be up to 2% waste daily.

CONTROL - When a company uses liquid bulk nitrogen, they are tied to a gas company and, very often, a long-term contract. With our system, we have fully automated N_2 on demand. No missed deliveries, escalating costs or contracts to sign. Moreover, liquid bulk costs continue to increase and the end user has no control over these costs."

What do you see at South-Tek as the best heat treating applications for your systems?

Paul: *"We can apply our N_2Gen nitrogen generators to a wide variety of heat treating applications, but some are certainly more suited than others. Probably the best fit for us and where we focus the most attention would be a continuous flow atmosphere with N_2 as an atmosphere component or N_2 itself. These would include N_2/H_2, N_2/CH_4, or just N_2 for cover gas in N_2 tempering, stress relieving, normalizing, annealing, hardening, CAAB (continuous atmosphere aluminum brazing), etc. Another continuous flow application would be N_2/methanol atmospheres for carburizing and neutral hardening. Chamber purging prior to FNC or nitriding or any other atmosphere process is another popular usage. We have also supplied systems to feed N_2 into vacuum degreasers that require a N_2 flow."*

What are the more challenging applications in heat treating?

Paul*: "Emergency purging becomes challenging in some plants because of the infrequency of outages in combination with the volume of gas required to have on hand to purge all atmosphere furnaces simultaneously (enough to flow at e-purge rates*

for as long as it takes to cool the load). However, we do have alternative technology that does not generate N_2 on demand but tops off HPC (High Pressure Cylinders) over a determined amount of time so our customer is ready for the next emergency purge. Gas quenching in vacuum furnaces is a good application for our systems (we can achieve the high purity required) so long as the quench pressure is not significantly high."

How much nitrogen does a company need to use before it makes economic sense to install a nitrogen generating system?

Paul: *"Our systems are sized and specified for a wide range of flow capacity and purity. Because of that, we can make a good economic case for about any capacity situation, especially when the users demand is steady. With nitrogen generation technology, machine capacity (i.e. flow) and purity are inversely related, so the payback will always be better with lower purity applications since the size of the system is reduced. Many times, we find a customer does not need the 99.998% purity that they initially believe they do. A lower, but suitable purity improves the economic payback of the N_2 generation process."*

What would a typical payback period for a system be? Even better do you have any case studies you can point to with lots of figures to show investment and payback?

Paul*: "Typically, a South-Tek N_2GEN system can reduce costs by up to 90% compared to the cost being charged by the gas company. The Return On Investment (ROI) is oftentimes very quick when the equipment is capitalized. However, should the customer finance the equipment, operational spend is reduced providing an immediate ROI. One great example to share is HONDA USA in Anna, OH. This particular customer reduced their spend on liquid bulk by 70%. Moreover, there was a larger reduction in manpower associated with managing the bulk supply and handling deliveries."*

How many systems do you estimate are installed and in use in North America?

Paul: *"We would estimate there are hundreds of nitrogen generators installed for Heat Treat applications in North America. This is not a new technology and as more users realize that there is an alternative to working with gas companies, the popularity of these systems continues to become more widespread."*

I have to ask this question. If this technology is so great, why are there so few systems in use in the heat treat industry?

Paul: *"This is a fallacy as many systems are currently installed in the heat treat industry and their popularity continues to increase. We are hearing more and more, "Why pay a premium for a gas that I can generate myself?" However, as with any technology, and with a different way of operating, change takes time.*
Additionally, many customers cannot make the transition as quickly as they would like due to being held captive by a 5-7-year gas contract. As customers face this, they oftentimes make it a key strategic planning objective to time their exits accordingly and make the switch as quickly as possible. Furthermore, early versions of nitrogen generation technology utilized membrane technology which is not nearly as robust as South-Tek's current Pressure Swing Adsorption (PSA) technology. PSA systems require less demand from the air compressors and are significantly more energy efficient. This leads to much better reliability and significantly reduced operating costs."

In reviewing these questions I see that every single one refers to nitrogen. I have been missing an obvious question. What about other gases? Heat treaters use lots of different gases. Have you ever looked at producing other gases? Could your technology be used for other types of gas generation?

Scott*: "*Nitrogen makes up 79% of the air we breath, meaning that it is the most abundant gas in our atmosphere. Therefore, it is the most cost effective to generate on site. Other gases simply are not as cost effective to generate (or feasible to generate) on site in the volumes that are needed for Heat Treating applications."

How is business for you these days and could you share with us about future plans for South-Tek?

Scott*: "Business is very good. South-Tek continues to grow year over year and our company is moving onward and upward every day. We have recently transitioned operations only a few miles from our previous facility into a custom designed, newly upfitted 66,000 sq. ft building. This comes at the right time as we were close to full capacity and were outgrowing our previous production space. We have also added over 20 new employees in the last 12 months. This exciting move is part of a strategic investment to boost production and overall operational excellence. Furthermore, this facility will allow for easier access to major highways. South-Tek continues to be the*

nation's leader in nitrogen generation systems. As part of our expansion, we are committed to developing the highest quality technology for Heat-Treating applications."

I appreciate the time today Scott and Paul. *"Thank you Gord."*