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NITROSource NEWS

JUNE 2020

Welcome to issue #7 of NITROSource News

I hope you are all keeping safe and well during this strange and concerning, but hopefully brief period of time in our lives. How things have changed since just a few months ago at the distributor conference held in Edinburgh!

Thankfully many of you are still finding ways to operate whilst practicing safe social distancing to protect both yourselves and customers. Crucially you are servicing key industries to ensure a continued supply of critical goods and services. We all still need to eat and take medicines while components for medical and non-medical equipment are laser cut, heat treated, soldered and blanketed using nitrogen gas.

Not having to rely on outsourced N2 supplies where personnel and production shortages may mean disruption to gas deliveries, as well as limiting site traffic and person to person interaction, is probably more critical than ever?

In this edition we take a look at applications in **Ireland, Turkey and Czech Republic.**

Old timer eventually retires in Irish water factory!

One point that is raised regularly with welcome approval, is the very long-life span of Parker's nitrogen generators. Generally, the design life for a Parker PSA generator is a minimum of 10 years, and the critical components are rapid life cycle tested during the product development stage to ensure suitability for the service life expected.

Often though we come across systems that have been operating far in excess of this design life, still producing the correct flow, purity and pressure as the day they were originally commissioned.

This really stands as testament to the design, build quality and materials of construction employed during the development of Parker nitrogen generators, as being truly best in class.

John Daly, Managing Director of Dalco Nitrogen Systems Ltd. based in Ireland explains about a recent success for mineral water production -

"The Classic Mineral Water Company Ltd., based in Lurgan, N. Ireland, was founded in 1948 by the late James McKee.

The source of their mineral water is found 150 metres below ground in Ulster white limestone chalk, which runs between Lough Neagh and the Lagan Valley. The water, which has been collecting in this chalk aquifer is extremely palatable and of high beneficial mineral content".



Existing N2MAX110 skid - 20 years old!



Bottling machinery



NITROSOURCE NEWS

JUNE 2020 ISSUE #07

Its composition and quality have remained unchanged for centuries because of the geological structure of the surrounding area. The unique location of Ireland in the western edge of Europe has resulted in an environment that is unspoilt and high in natural resources, for more than 60 million years basalt lava overlaying chalk has been subject to weathering and erosion which has resulted in the formation of a multi-layered mass of rock – an excellent filter 150 meters deep which permits only slow percolation of ground water. It is this long, slow filtration that gives Classic Irish Water its exceptional purity and unique mineral composition.”

Over 20 years ago, Dalco Nitrogen Systems installed an N2 MAX110 producing 17m³/h @ 0.5% MROC at Classic Water. The nitrogen is used during the bottling process for counter pressure filling, product transfer and bottle head space blanketing.

Having worked faultlessly for 20 years, when an upgrade was required to cope with a doubling in production capacity, Dalco proposed a new NITROSource PSA package.

An N2-25PBMM was duly ordered and installed along with an OFAS-55, buffer and a 1000 litre nitrogen storage vessel. This increased the nitrogen capacity to 32m³h @ 0.5% MROC.

What is the oldest nitrogen generator still operating in your local region? Please send me details and we will feature the installation and distributor in a future edition.



Turkish cheese producer ditches pre-mix for self-mix.

Kebir Dairy – Turkey

Metin Çelik, Food and Pharmaceutical Industrial Engineer from Parker's long standing distributor DHE, based in Turkey, shares an application for cheese packing, where previous good experience with MIDIGAS has led to a successful capacity upgrade using the new NITROSource Compact.

Kebir Dairy is based in Trabazon on the Black Sea coast in the North of Turkey.

They were using pre-mixed cylinders of nitrogen and carbon dioxide for the MAP of curd cheese @ 70N₂:30CO₂ on a vertical form fill and seal machine, along with a 60N₂:40CO₂ mix on a thermoformer for sliced cheddar.

Pre-mixed cylinders although convenient, are probably one of the most expensive methods of buying modified atmosphere packing gases.

Realising this, Metin made contact with Kebir in January 2017 to explain to them about the cost savings that could be achieved by using a nitrogen generator with CO₂ cylinders and a gas mixing panel.

After exhaustive analysis of their gas usage and costs, Metin proposed a suitable gas generation system and won the order in the following September for a MIDIGAS 6 along with DAS7 pre-treatment package.

In addition, Metin states – *“Because of the need to mix nitrogen and carbon dioxide, we installed a gas mixing panel manufactured by BSL Gas Technologies, based in the UK, and a 50-litre mixed gas buffer vessel. This configuration provides the equivalent mixed gas output of one of the pre-mixed cylinders per hour at a fraction of the cost!”*

To ensure that the CO₂ cylinders are always able to provide gas to the mixing panel as reliably as the MIDIGAS 6 generator, DHE's engineering team also designed a PLC based cylinder change-over system.

It is critical that the mixed gas ratio is always maintained within the pack, so running out of CO₂ had to be avoided at all costs and was considered a critical control point.

The cylinder change over panel has a very loud alarm that only stops when both the on-line and spare cylinder contain enough gas to trip the pressure switch.”

Kebir's production manager, Nihat Özderya, states – “We have been really happy with the nitrogen system and it produces gas at a much lower cost than the expensive pre-mixed cylinders. We achieved pay-back on investment in just 6 months! Now we have decided to produce our own nitrogen for the second production facility, I have just ordered the new NITROSource Compact 6 version from Metin.”



Metin (left) and a happy Mr. Nihat Özderya standing in front of the current MIDIGAS installation.



NITROSOURCE NEWS

JUNE 2020 ISSUE #07



NITROSource PSA defends high quality legumes, pulses and rice from insect attack!

Podravka-Lagris is a well-established food brand within the Czech Republic that has been synonymous with quality products for over 85 years

Podravka-Lagris procures legumes, pulses and rice from suppliers locally in the Czech Republic and from abroad, then packs and distributes them for the retail market.

As much as humans enjoy eating these products, tiny insects do too!

These pests get into the plants whilst in the field growing and post harvest during processing and storage. They reproduce continually as long as the conditions are suitable.

This can be a big problem, because Podravka-Lagris guarantees its partners and customers that there will be no insects in the products. Although Czech legislation allows 3 insects per 1 kilogram of raw material, some customers from large chains do not tolerate even that. The absence of all traces of these microscopic creatures is therefore crucial to Podravka-Lagris's continued success.

Currently, insect infestation is controlled by fumigation using an extremely toxic gas, typically hydrogen phosphate. However this has associated safety risks, including the possibility of residues in the product.

Insects can also become resistant over time and the doses needed to kill them must be increased. If insects encounter a toxin (hydrogen phosphate) in insufficient concentration and they survive, they acquire resistance. This immunity is then passed on to their offspring.

To overcome this problem, Podravka-Lagris, took a fresh approach and in cooperation with the Plant Production Research Institute, started working on a project to control insects using oxygen exclusion with non-toxic nitrogen gas.

The nitrogen is injected at a precisely determined concentration into the storage silos, over a period of 10 to 20 days. This period of time is necessary for the nitrogen created hypoxic atmosphere to work effectively against the insects, larvae and eggs.

The larvae and eggs can tolerate a lower oxygen level whilst the adult insects are eradicated relatively quickly.

An exposure period in the nitrogen atmosphere of just less than three weeks has been determined as optimum to completely destroy every single pest.



To produce the required volumes of nitrogen gas by the most efficient, cost effective and reliable method possible a Parker NITROSource PSA system was duly proposed and installed by Jiří Gerych from Parker's distributor - Parker Servis.

Ambient temperature is another factor that needs to be considered in ensuring nitrogen works most effectively in eradicating the insects.

At lower temperatures in the silos, the insect's metabolism slows and therefore they require less oxygen for respiration, increasing the necessary exposure time required to the hypoxic atmosphere.

In a really smart move by Jiří, Parker Servis suggested installing all the equipment including the compressors within the silo storage area. The waste heat from the nitrogen generation system helps to keep the silos and their contents

at warmer ambient temperatures and creates the ideal environment for the hypoxic atmosphere to be at its most effective.

Not only does the waste heat, warm the silos but it also saves Podravka-Lagris energy costs for heating the warehouse as well as reducing humidity, helping to keep the produce dry.

Podravka-Lagris has subsequently installed two Parker nitrogen systems for two separate silo applications and storage warehouses.

The first system comprises an N2-65P with EST producing up to 67m³/h @ 0.5%. The pre-treatment used is an MXLE because there is an additional food grade compressed air demand for an optical sorter machine that removes substandard product as it is processed for packing using jets of air.

The second system is also an N2-65P with EST producing up to 67m³/h @ 0.5% purity but with a dedicated OFAS compressed air pre-treatment package.

Current analysis of the total cost of Parker's gas generation solution including energy and maintenance demonstrates a 50% saving compared to toxic hydrogen phosphate fumigation without considering the environmental and personnel risk that this process entails.



Improving chances of sales success

I am sure most will agree, that selling a Parker nitrogen gas generation system is a "project" type sale that involves assembling, installing and piping individual machines, typically compressors, dryers as well as the generator, to create a fully functioning generated gas supply.

As you know, there are many other considerations too such as where to site it, remote communication, control integration, accessibility and future expansion, to name a few.

When faced with an enquiry for a nitrogen gas supply, often against a preconceived specification based around a bulk vessel or competitor's product, it can take a lot of time and effort to persuade the customer to accept your recommendations and win the business.

Considering larger projects that may involve a nitrogen gas supply as part of a much bigger overall scheme, such as building a new factory or a chemistry facility at a university, for example, these often have many different companies involved in the procurement chain.

The client may engage architects and an overall project management company. In turn many individual speciality suppliers and sub-suppliers are asked to quote against a specification for their appropriate products and services to ensure best value.

Generally, the compressed air and nitrogen gas system is quite a way down this chain and usually under the control of what is known as an M+E contractor, (Mechanical & Electrical). The M+E contractors are often themselves competing to be selected, making the whole process very price driven.

Still, even now, we find in practice, many project management design and build companies are not fully aware of gas generation, and a liquid or cylinder supply is initially specified, making the task even more difficult.

Wouldn't it be great to be able to reach out to the initial project consultants and get your solution accepted, "designed-in" and specified right from the start?

I am sure this is something you all strive to do but it is often quite difficult to action.

In the UK we have just begun with gas generation to follow in a very successful process initiated by the Transair team where we educate these design consultants and building services contractors through their CPD program - Continual Personal Development.

The persons we really want to reach are often members of Chartered Institutes and similar associations.

We are starting with The Chartered Institute of Building Services Engineers - CIBSE and have produced a non-commercial presentation that is approximately 30 minutes duration, that explains the differences between traditional methods of nitrogen supply and gas generation.

We will deliver the presentation via a webinar type platform where attendees register and after viewing the content can ask questions and will receive a certificate to assist with their CPD targets.

The aim is to get project initiators and specifiers considering gas generation for appropriate applications and to remember where they received the information from to investigate further.

Are there associations and institutes such as this in your local region? Would you like to have the tools to try this approach?

We have flyers, the presentation and a script we can share with you so that you can be ready quite quickly to apply this in your region. Please contact me if you would like further details.

The flyer features the Parker logo and the slogan "ENGINEERING YOUR SUCCESS." It includes a photograph of industrial gas equipment. The main heading is "Learn more about the alternatives to traditional methods of industrial gas supply". Below this, it states: "During these unprecedented and challenging times, you may be considering taking the time to boost your professional development?" and "Parker is pleased to bring learning opportunities direct to you, through our live webinars focusing on improving your knowledge relating to on-site nitrogen generation as an alternative to traditional". An agenda list is provided: "Learning points", "What is Nitrogen and why is it used?", "Traditional methods of nitrogen supply", "Technologies to make nitrogen on site", "CO2 footprint", "Advantages and disadvantages", "Case studies", and "Questions?". The CIBSE logo is also present.



Some interesting facts about Nitrogen!

While Earth's atmosphere is made up of approx. 78% nitrogen gas, the atmosphere on Mars is only 2.6%. In contrast the atmosphere of Saturn's largest moon, Titan, is composed of 95% nitrogen.

Nitrogen is present in every living organism and makes up 3% of our bodies. It is present in our DNA and RNA.

The US Declaration of Independence and the hand-written Constitution of India are preserved in hermetically sealed containers filled with nitrogen to preserve them for eternity.

The name "Nitrogen" was created in 1790 by a French chemist, Jean-Antoine-Claude Chaptal. It is derived from two Greek words - Nitron and Genes.

This is because it was already known that nitrogen was present in nitrates and nitric acid. In Greek, Nitron means Niter and Genes means forming. So Nitron Genes (shortened to Nitrogen), means Niter Forming.

Later another French chemist, Antoine Lavoisier derived a different name for it - "Azote", a Greek word meaning Asphyxiation, because breathing nitrogen causes death by oxygen starvation.

Thanks for reading

and thanks to those that have contributed article details for this edition

If you have an application to share, please let me know and I will help develop an article. I just need the basic information and I can then work with you to expand upon the detail.

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