

## CIRRUS<sup>®</sup> highlights at a glance

- For batch or continuous process
- Reliability – few moving parts
- Very low power consumption
- No secondary waste streams
- Potential to recycle recovered solvents
- Fast response – modular equipment
- Compact – small footprint
- Flexible commercial options
- Process modelling capability

## CIRRUS<sup>®</sup> VEC.

Aesica teams up with Linde to ensure the highest emission control standards.

### The customer

Aesica is a leading integrated supplier of contract development and manufacturing services for formulated products and active pharmaceutical ingredients (APIs). Founded in 2004 and with approximately 1300 employees, Aesica is a fast-growing UK company with a global footprint including operations spanning Europe, North America and Asia.

Committed to being a good corporate citizen and to the highest standards of environmental management, Aesica has been recognised with industry awards for its environmental performance. As it continues to expand its portfolio, Aesica makes every effort to maintain or raise its emission control standards.

### The challenge

State-of-the-art facilities in Cramlington (UK) deliver APIs and formulated products for a growing number of markets. These new products sometimes present new emission control challenges, particularly in relation to organic solvents. Organic solvents are required for many key manufacturing processes in the chemical and pharmaceutical industry. Due to their highly volatile nature, it is not possible to effectively reduce the concentration of these solvents in reactor off-gases using traditional condenser technology. However, emissions of solvent gas streams to atmosphere can be environmentally damaging and therefore have to be controlled.

## The solution

Aesica turned to its long-standing business partner BOC (UK member of The Linde Group) to help it control emissions from a new exhaust gas stream. Over the years, Aesica has built a relationship of trust with Linde as the local application team has clearly proven that it understands and can meet Aesica's specialised needs for industrial compressed gases, speciality gases and medical/pharmaceutical-grade gases. Already a buyer of liquid nitrogen from Linde, Aesica was keen to explore how Linde's VOC abatement solution, CIRRUS® VEC (Vapour Emission Control), could not only resolve its emission control challenge, but also enable it to get better value from its liquid nitrogen.

Like most chemical and pharmaceutical manufacturers, Aesica uses gaseous nitrogen as an inerting and purging agent to maintain product quality and purity. It can also be used to prevent explosions or fires if flammable solvents are present. Gaseous nitrogen is typically generated by evaporating liquid nitrogen, which is stored at cryogenic temperatures (-196°C). Usually supplied in cryogenic form for ease of transport and storage, liquid nitrogen possesses a lot of cooling potential. CIRRUS can harness this cooling power to abate solvent emissions. CIRRUS technology has been specially designed to give very accurate and controlled cooling performance, a key requirement for successful and reliable solvent emissions abatement. Once the solvent has been recovered as a liquid, it may be either recycled back into the manufacturing process or disposed of in a controlled way. Approximately 50% of Linde's CIRRUS installations recycle solvents, thus making a valuable contribution to resource conservation. The gaseous nitrogen generated in the CIRRUS process is entirely pure and clean and can easily be conditioned for standard purging and inerting applications.



## Benefits

CIRRUS® VEC is a simple, cost-effective, flexible and reliable way to meet Aesica's VOC abatement challenges. The benefits of CIRRUS extend beyond environmental protection to include low energy consumption, solvent recycling capabilities and a low carbon footprint, as "waste" cold can be used and clean nitrogen can be recycled. As Mike Battrum, Group Engineering Manager for Aesica commented: "We are committed to minimising the environmental impact of our production activities. We reviewed the options for solvent emissions control for one of our exhaust gas streams and Linde's CIRRUS cryo-condensation technology seemed ideally suited. One of the key advantages for our business is that by making use of the cold energy in the liquid nitrogen we already consumed, we achieve our environmental objectives with minimal additional running cost and energy consumption – so it is a very elegant and efficient solution."



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## Looking ahead

The modular, simple and compact design of CIRRUS gives Aesica the flexibility to add to its existing system and increase VOC abatement capabilities in future. As Battrum explains: "Aesica is rapidly expanding and diversifying its production capabilities with new products for a growing number of customers. The ability to cut the emissions of a wide range of very volatile solvents will enable Aesica to meet market needs and be competitive well into the future."

**"Contract manufacturers such as Aesica require fast turnarounds and this meant a challenging programme for installation and commissioning. We were pleased that close cooperation between Aesica and BOC meant the system could be installed and commissioned successfully and to the required timescale and budget."**

Mike Battrum  
Group Engineering Manager for Aesica