

Afrox invests in a new speciality gases plant

Afrox has recently completed a new made-to-order speciality gases plant in response to rising market demand for complex gas mixtures.

The complex gases produced at Afrox's new gravimetric filling plant will be main source of all made-to-order gas mixtures, supplying customers throughout South Africa and its neighbouring countries.

Designed for improved accuracy and efficiency, the new automated facility in Germiston allows for up to 16 fixed line input components, which can be increased by introducing premixed components on separate filling rigs for oxidant and flammable/toxic mixtures. The filling and component selection procedures are pre-programmed and digitally controlled in a process that also operates actuated control valves integrated into a scale.

The modern, mechanised facility allows for the blending of high accuracy multiple part gas mixtures, with a blending tolerance of 2% to 5% and an analytical uncertainty of 0.5% to 2%, depending on the concentrations of components required and the varying levels of certification needed.

Tony Flude, project manager at Afrox, says the need for an improved, automated facility arose as customer needs evolved and the demand for complex gas mixtures increased, which had previously been processed at Afrox's Special Gases manual gravimetric filling plant. The original plant's ability to produce complex mixtures within acceptable lead times and within acceptable tolerances had become a challenge and some gas mixtures had to be imported

to meet customer requirements. Safety was also a consideration and the total separation of oxidant and flammable mixtures is an additional benefit of the new facility.

"The new facility is capable of producing many of the multipart mixtures that were previously imported," says Flude, explaining that local complex gas production not only improves lead times but is also safer, because of the risks involved in importing hazardous and volatile gases.

"The semi-automated fill valves reduce material wastage, while a booster pump that increases the pressure of low pressure gases significantly reduces filling time," continues Flude.

He adds that Afrox's staff have been trained to operate the new equipment, and the specialist skills from the original plant have been transferred to the new facility.

Planning the design of the automated plant began two years ago. As a member of the global Linde group, Afrox was able to draw on the technical expertise gained from other members within the global gases group. Following in-depth investigation, it was identified that technology used at the new Special Gases gravimetric filling plant commissioned in Australia most closely matched Afrox's requirements, and was adapted to suit Afrox's requirements and meet local conditions.

"After thorough analysis, our engineering team concluded that Afrox could design and construct a filling plant utilising a

process description based on the facility at BOC Australia. While our process was 100% locally designed, being part of the Linde Group gave us access to the latest technology and international experience," says Flude.

He comments that the brownfields project was logistically challenging as the new facility had to be built without affecting the operation of the existing plant, and stringent safety measures were vital owing to the proximity of toxic and flammable gases.

The nationwide COVID-19 lockdown further complicated the project, halting the installation of new equipment for several months. Despite these delays and challenges, Flude says the new plant is now fully operational, with only a few minor works to complete.

Afrox's database of speciality gas mixtures contains over 4 000 individual product recipes, ensuring an end product that is fit for purpose. Customised blends are available to meet individual needs, with each mixture unique to application and industry requirements. Multipart gas blends range from simple two-component mixtures to more than twenty components, with concentrations ranging from parts per million to percent levels.

Afrox's experienced technical team formulates the mixtures, and is supported by the latest thermodynamic software to ensure safety, accuracy and stability. The new speciality gases facility will be certified to ISO 17034, ISO 17025 and ISO 9001 standards, which will enable Afrox to blend and analyse Certified Reference Standards, Primary Gravimetric Standards, Calibration Standards, and standard gas mixtures.

Afrox's extensive range of special gases is widely used in the automotive and petrochemicals industry, and plays an important role in mining and metallurgy. Afrox also has longstanding partnerships within the healthcare and pharmaceutical industries supplying precise, bespoke gas mixtures. The company is at the forefront of environmental management, providing products, services and expertise to help customers tackle environmental challenges.



Afrox's new gravimetric filling plant will be main source of made-to-order gas mixtures.

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