

Offshore

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Packing Innovation

Delivering Industrial Gases



As in any branch of industry, only a small number of suppliers of industrial gases operate internationally. Linde AG, which has now been in existence for 125 years, is one of them. It was Linde AG that purchased its fellow multinational AGA AB in 2000. That same year, Linde AG also purchased the Dutch market leader, a listed company called Hoek Loos, with which Linde had had a know how agreement since the 1980s. For the Dutch market, the acquisition of the Swedish company AGA AB in effect meant that Linde would transfer a portion of AGA Gas Nederland's activities to Hoek Loos. In 2007, one hundred years after it was originally founded, this Schiedam-based company changed its name to Linde Gas Benelux. Linde AG and the British company BOC (British Oxygen Company) had also flirted with the idea of merging on a number of occasions. They worked together in 2000, for example, to build the largest nitrogen plant in the world in Mexico, and two years later they set up a joint engineering venture in Ohio. In 2006, BOC was absorbed by its German competitor Linde AG. From that moment 'The Linde Group', employed more than 50,000 people in over seventy countries.

Tempting Prospect

Of the core requirements of the offshore industry, flexibility is most important. Suppliers must be willing to deliver 24/7 and deliveries must be on time and complete. Additionally, the packaging must be of sufficient quality for the intended use at the intended location, and at the same time be user-friendly as well. Whilst the products and services themselves must be safe, they must be safely delivered. It all started in 1948 when the Dutch company Heerema began its first assignment on Lake Maracaibo in Venezuela. At that time, the entire industry had acquired considerable experience in drilling for gas and oil from offshore platforms, with the Gulf of Mexico quickly becoming the main focus area. For American companies such as Brown and Root, McDermott, and Santa Fé – as well as a whole range of

The problem solving capacity in the supply chain is of paramount importance. Gas suppliers cannot afford to compromise when it comes to meeting the core requirements of the offshore industry.

other players in the industry who rapidly built up experience at the same time as Heerema – the North Sea soon became a tempting prospect. In the early 1960s, this was reason enough for the Dutch contractor, together with a number of oil companies, to leap at the opportunity and commission a study into potential for oil and gas fields in the North Sea.

Improving Packaging

In the 1970s, NAPM (Nederlands/Amerikaanse Pijpleiding Maatschappij) was the main Dutch customer for welding and cutting gases from the originally Swedish AGA. NAPM later went bankrupt and relaunched under the name THC. At this point, it struggled to meet its financial obligations to AGA. Once Heerema had taken over the THC yard (which is now the Heerema Vlissingen yard), AGA Gas Nederland was asked to help consider how a variety of processes and packaging might be improved. The gas supplier's efforts were focused primarily on increasing quality by switching from electrode welding to MIG welding, which eventually greatly increased the demand for mixed gases. However, working with multiple gas cylinders was considered extremely inconvenient. To keep operations running efficiently, the cylinders had to be changed too often and they would frequently 'disappear over the side' once they were empty. This led not only to discussions with gas suppliers regarding the number of cylinders on loan/in use, but obviously also to unnecessary pollution. A hoisting frame with a small door was developed specially for NAM – this frame has since become standard in the industry.

Round the Clock

Before long, AGA Gas had become the market leader for offshore gases – certainly in the Netherlands at that time – and the company came up with a new concept: they developed large containers which could hold four gas cylinder bundles.

In Rotterdam and Den Helder, AGA Gas Nederland opened special branches that could supply gases to the offshore





industry 24 hours a day, seven days a week. The special bundle of coupled gas cylinders that is still being used today to supply offshore companies was developed at the request of Heerema in 1991, which still plays a key role in the offshore industry. In 1996, a special oxygen cylinder appeared, in response to a number of accidents with the old cylinders when sea water had entered the cylinder. As it is, sea water is already extremely corrosive when it comes into contact with steel, but it is all the more so when the steel jacket contains pure oxygen. To keep sea water out of the oxygen cylinders, a new cylinder was invented with a residual gas shut-off valve.

Certified Safety

The importance of the offshore market for the Linde Group continues to increase. The Group's position is strong in Norway, Denmark and other countries, such as Scotland (Aberdeen). In the Netherlands, the Group now operates under the name Linde Gas Benelux, which has therefore taken over the AGA baton as far as Heerema is concerned. The company supplies, amongst others, cylinder bundles containing acetylene, nitrogen, oxygen, argon and carbon dioxide. All of them are especially designed for the offshore market. Thanks to worldwide presence of Linde, the company is a global supplier.

Linde's credentials state that safety is its number one priority, wherever and whenever, and with no compromises. While more and more emphasis was gradually placed on certification and inspections in the 1990s, today, all of Linde's offshore DNV-approved packaging is certified in accordance with NOGEPA and ISO 12079 regulations. Safety also features prominently in the development of new products.

A number of more recently developed products also have everything to do with safety. For example, Linde already supplies large amounts of Odorox in cylinder bundles to the Norwegian market. This odourised oxygen is used somewhat less frequently in the Benelux offshore industry, which is odd, because using 'scented' oxygen is a smart way to prevent unintended oxygen enrichment, particularly in small working areas that are poorly ventilated.

This oxygen additive helps protect users by warning them

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about the risk of a fire or an explosion caused by oxygen enrichment.

Limited Commodity

In general, space is a limited commodity in the offshore industry. Therefore, Linde has supplied a great many refillable Ecocyl cylinders, which are ideal for monitoring atmospheric gases, thanks to their one litre capacity and pressure regulator with integrated flow meter. Incidentally, these small cylinders are suited to a wide variety of applications including maintenance work, leak detection, equipment calibration or measuring emissions, even in areas that can be difficult to access. In practice, Ecocyl cylinders are also frequently used to inspect personal protective equipment. Linde has also developed the Vivantos concept for smaller-scale welding and cutting operations. By filling the cylinders to a pressure of 300 bars, each cylinder can hold more gas. The most striking feature is the integrated, and most notably,



Gesellschaft für Linde's Eismaschinen

At a sometimes staggering pace and with a great love of experimentation, Carl von Linde created a new industry within just a few decades. His engineering company, the "Gesellschaft für Linde's Eismaschinen", was characterized from the very beginning by its ability to innovate and its close attention to customer relations. With air liquefaction, Carl von Linde created the conditions needed to produce pure gases using low-temperature processes. These gases include not only oxygen and nitrogen, but also hydrogen and inert gases – a technology for which the future has only just begun.

freely variable pressure regulator, which is equipped with a universal automatic hitch. The fact that the pressure regulator is freely variable makes these cylinders especially user friendly, in addition to the availability of very compact models.

To prevent malfunctioning, it is vital that all offshore equipment undergo certified maintenance. The work of globally engaged Linde Nitrogen Services is characterised by strict procedures and risk analyses. This special unit comes complete with flying purgers, purge skids, a high-pressure pump unit that can also operate in zone two, a high-temperature pump unit, pressure and flow meters, cryogenic pipe-freezing equipment and helium leak testing equipment. This not only makes it possible to carry out purge and blanketing assignments, but also pressure tests, pipeline displacements, sparging, drying and pigging.

i. www.linde.com