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Linde LienHwa making new gas production investments in Taiwan

Joseph Tsai, DIGITIMES, Taipei [Tuesday 17 October 2017]

Linde LienHwa, a joint venture between the Germany-based Linde Group and Taiwan-based LienHwa Industrial, is a manufacturer of bulk and electronic specialty gases used during the manufacturing of semiconductors, displays, solar panels, LEDs and others.

The company has been operating in Taiwan's gas manufacturing and supply industry for over 30 years and has already grown to become a major gas supplier for many electronics players in both Taiwan and China.

In September 2017, Linde LienHwa announced investments in production of electronic special gases at two Taiwan facilities - octafluorobutane (C₄F₈) purification and filling facility in Taichung, and hexachlorodisilane (HCDS) transfill facility in Taoyuan - to enhance its portfolio to meet growing demand from its Taiwan-based and international clients.

Linde LienHwa currently has capacity of over 100 tons of C₄F₈ per year for use in advanced semiconductor etching processes as well as cleaning production chambers in predominantly older-sized semiconductor tools.

Since the transfill process involves repackaging material into specialized stainless steel vessels while improving the purity and validating the quality, Linde LienHwa's investment in transfilling facility for HCDS is sized to serve both Taiwan and customers throughout Asia. HCDS is used for depositing silicon compounds at very low process temperatures, which is important for making nanoscale electrical insulators in memory and logic processor chips.

During an interview by Digitimes, Linde Electronics' head of Global Electronics Andreas Weisheit and head of Market Development Paul Stockman pointed out that the company is currently operating in many different value channels. It makes many of the materials in-house. For some materials, the company purchases them from outside suppliers and purifies them for its clients. It also sources some materials from third-party players and conducts analysis and repackaging-into-container services for semiconductor and electronics clients.

The company has three modes of delivery. Most of its products are produced, purified, and packaged off-site into various sized containers. These range from small-sized gas lecture bottles, to larger gas cylinders, to tube and ISO containers the length of a shipping container. The materials for the containers are primarily

made from stainless steel or aluminum, but can use specialized materials like nickel and alloys to contain more reactive chemicals.

Some of its products are used in such high volumes that its customers use bulk storage tanks located on their sites instead. Linde LienHwa produces these materials - for example oxygen, argon, and carbon dioxide - in ultra-high purity plants off-site, and transports them in bulk trucks to keep customer tanks topped-up. Remote monitoring allows the company to optimize deliveries to ensure customers always have adequate supply.

Lastly, nitrogen is used in such high volumes at modern electronic manufacturing plants that it is most economical to produce it on-site, either as a dedicated plant or as part of the network of plants in a science park connected by a common pipeline. Here, production of gaseous nitrogen is continuous, and supply is backed-up by storing reserve amounts as liquid. Linde LienHwa and its customers monitor the purity jointly in real time.

These on-site nitrogen plants are another way in which Linde LienHwa invests with its customers. Because of the size, cost, and complexity of the plants, planning and construction occur at the same time its customers build their facilities. This early investment allows customers to have ultra-high purity nitrogen available as soon as the extensive pipework for their plants are put in place.

The company has been increasing its investments in Taiwan. Linde LienHwa moved its global electronics R&D center from the US to Taiwan in 2016. The company expects the R&D center to further enhance the company's development and to provide better quality support to clients.

Earlier in 2017, the company also moved its headquarters of Global Electronics from Singapore to Taiwan and re-assigned executives to Taiwan to provide better services for their clients in Taiwan and China.

Linde LienHwa said it is not looking to be only a gas material supplier to its clients, but also a trusted partner. With many of its semiconductor clients aggressively advancing into 10nm, 7nm, 5nm, and even 3nm manufacturing processes, and clients from other industries planning to develop new applications, the company has been working closely with all its clients to assist them to achieve their goals.