Высокочистые материалы и комплексные услуги для полупроводниковой промышленности

HIGH-PURITY MATERIALS AND COMPREHENSIVE SERVICES FOR THE SEMICONDUCTOR INDUSTRY

Мировой лидер в области поставки газов, технологий и услуг для промышленности и здравоохранения – компания Air Liquide – представлена в 80 странах мира, где ее решения используют более 3 млн. клиентов. В штате компании работают около 68 тыс. сотрудников. В 2015 году оборот Air Liquide составил 16,4 млрд. евро. О решениях компании для полупроводниковой отрасли рассказал директор российского представительства Air Liquide Electronics Нобер Фанжа.

Господин Фанжа, каковы задачи Air Liquide при создании решений для промышленности и науки?

Во-первых, мы должны предвидеть потребности заказчиков. Наши инновационные материалы для электроники обеспечивают соответствие все более жестким требованиям к мобильности, простоте связи компонентов, вычислительной мощности и энергоэффективности. Мы предлагаем сверхчистые газы-носители, широкий спектр специальных газов и передовые молекулярные прекурсоры, а также оборудование для безопасного распределения, очистки и контроля чистоты в режиме реального времени.

Во-вторых, заказчики стремятся совершенствовать свое производство. При этом они полагаются на наш опыт в создании комплексных систем для обеспечения предприятий газами и другими химикатами, и с нашей помощью постоянно улучшают производственные процессы.

Благодаря акценту на инновации и быстрой реакции на новые тенденции нам удается предупреждать вызовы рынка.

Каковы основные направления развития вашего бизнеса?

Первым направлением являются специальные материалы для электроники. Производителям полупроводниковых приборов и фотovoltaики необходимы высокочистые технологические газы и химикаты – то, что принято обозначать термином "специальные материалы для электроники".

Формирование очень тонких слоев различных элементов (таких как кремний или металлы) требует точного контроля процессов осаждения и преобразования структур. Например, кремний, являющийся самым распространенным материалом электроники, получают с использованием летучего прекурсора – моносилана. Наши решения позволяют достичь точности на уровне всего лишь нескольких атомов. Мы создали девять специализированных центров (Electronics Materials Center, EMC), в которых производят и сертифицируют специальные материалы для электроники. Эти центры, расположенные в странах с наиболее развитой полупроводниковой промышленностью, включая Южную Корею, Японию, Китай, Тайвань, Сингапур, США, Францию и Германию, обеспечивали надежду для быстрого и надежного развития промышленности.
Mr. Fanjat, what are the challenges facing AIR LIQUIDE in the industrial market and science?

The first major challenge is anticipating consumer needs. Our innovative electronic materials respond to increasingly challenging customer demands for improved mobility, connectivity, computing power and energy consumption. We offer ultra-pure carrier gases, a wide range of specialty gases and advanced precursor molecules, including equipment for safe distribution, purification and on-line purity control.

The second significant challenge is constantly improving our client's procedures. On site, manufacturers rely on our expertise in providing full management of these gases, advanced molecules and equipment and in helping to continuously improve their production processes.

Thanks to our continuous innovation and our responsiveness, we anticipate the development of tomorrow's needs.

What are the main areas of technological development?

The first such area is electronics specialty materials. Manufacturers of semiconductors and photovoltaic cells require reliable supplies of high-purity process gases and chemicals, also called electronics specialty materials. Forming very thin layers of various elements (such as silicon or metals) require acute control over the depositing and structuring of these elements. Silicon, for example, the most common material found in electronics devices, is formed using monosilane as a volatile silicon precursor. Electronics specialty materials provided by Air Liquide can achieve this at the level of just a few atoms. Our capabilities include nine Electronics Materials Centers (EMCs) worldwide where Air Liquide produces, packages and certifies electronics specialty materials ensuring safety of supply and matching quality expectations of most demanding electronics customers.

Air Liquide is a leader in the electronics industry in key regions including South Korea, Japan, China, Taiwan, Singapore, the USA, France and Germany.

The second area of development is analytical services. The process for manufacturing of electronic components (e.g. semiconductor
chips, photovoltaic cells) includes anywhere from 20 to 250 steps. These process steps must be performed in a controlled environment using high quality materials.

From sampling and measuring to characterization and more, Air Liquide’s world-class analytical services are key in helping electronics manufacturers control, monitor and improve their Fab throughput, and assure the quality of electronic devices. We offer comprehensive analytical services through our Balazs NanoAnalysis and Toshiba Nanoanalysis subsidiaries.

These services ensure the purity of starting materials, consumables, process tool components, cleanroom environment and clean manufacturing procedures meet the requirement to manufacture high-technology products. Our expertise extends to contamination problem solving to trace back any detected contamination to the root source. Our goal is to help customers improve their yield and to develop and implement faster next generation technologies.

What would you highlight as significant innovations of AIR LIQUIDE?
Air Liquide invents and produces innovative molecules the world’s electronics technology leaders require. Custom designed, our wide range of services and equipment facilitate uninterrupted onsite management of gas in compliance with the highest standards of safety.

As already noted, today’s electronics industry demands materials that enable technologies which improve connectivity, computing power and energy consumption. We offer a complete range of electronics advanced materials (also called precursor molecules).

Air Liquide is the industry leader in advanced thin-film materials, offering the ALOHA and Voltaix product lines as part of our material portfolio. The 2013 acquisition of Voltaix, the recognized world leader in silicon, germanium and boron chemistries, has bolstered our position. We have extended our range of advanced precursors, strengthened our relations with key customers and partners, and created new synergies in the research and industrialization of electronics advanced materials.

Our materials offer covers a broad range of advanced deposition processes, ranging from low-k to high-k and metals to barrier films. These products come in a comprehensive package that includes dedicated OEM-qualified delivery systems, ultra-high purity canisters, and extremely tight specifications, backed by world-class Air Liquide affiliates in nano-scale analysis (Balazs NanoAnalysis and Toshiba Nanoanalysis).
Air Liquide’s global capabilities include eight Advanced Materials Centers (AMCs) where we produce, package and certify advanced electronics materials ensuring safety of supply and matching quality expectations of our most demanding customers.

What determines the success of your products and services? Safety, quality, stability & reliability. Safety is our first priority! It is at the very heart of our corporate culture and part of our responsibility commitment, with a formal objective of “zero accidents, on every site, in every region, in every unit” for all our stakeholders.

Air Liquide Electronics is also committed to offer the best quality, stability and reliability required by our customers. Our wide range of services and equipment facilitate uninterrupted onsite management of gas in compliance with the highest standards of safety. Our 3,500 specialists worldwide are dedicated to providing the agility and reliability our customers require.

Air Liquide Electronics is a long-term partner that provide innovative solutions for the markets of semiconductors, photovoltaics and flat panel displays. We contribute to the innovation of the world’s most advanced companies in the electronic industry. As a world reference in the design, manufacturing and delivery of molecules, we conceive for our clients the infinitely small and enable them to think amazingly big.

Which projects in Russia would you like to mention? Air Liquide Electronics Russia started his activities in 2007 and since has developed a competent team with a significant number of advanced technology customers providing services and solutions.

Building a long term partnership with our first semiconductor customer Mikron by providing complete solution for gases, installation and services, the electronics activity in Russia was firmly established and has extended with other semiconductor customers. Today, Air Liquide Russia has an enlarged portfolio of specialty materials and high purity carrier gases with solutions for gas distribution and service. Mikron trusted Air Liquide Russia for its first ground project (180 nm) and a few years later for the second production line installation (90 nm). It was followed by the start-up of dedicated air separation unit (APSA) and H2/O2 plant to supply nitrogen, hydrogen, oxygen and compressed dry air.

What are the plans of the business development in the Russian market? Our plans are continue to grow with a long term vision and with the trust and satisfaction of our customers.

Thanks for the interesting story.

Interview by Dmitry Gudilin