

A MULTI-FLUID,
MULTI-SERVICE OFFER

- > supply of ultra-pure fluids, particularly chemical liquids and gases plus implementation systems for the fabrication and assembly of semiconductors
- > complete fluid management within an electronics site, with on-site teams
- > research into advanced technologies in close partnership with major customers
- > environmentally-friendly effluent treatment solutions



electronics

— Over 600 Air Liquide employees work at electronics customer sites worldwide, ensuring full management of ultra-pure chemical liquids and gases.

MORE AND MORE CHIPS!

Almost non-existent just a few decades ago, chips are now part of every aspect of our daily life. Electronic chips can be found in computers, cell phones, DVD readers, game consoles, digital cameras, automobiles, and many other well-known products. The semiconductor market has seen annual growth in excess of 15% for the last 30 years, and is still strong despite periods of adjustment (2001/2002, for example). Technologies are developing at great speed: 30 years ago, a microprocessor contained only 3,000 transistors - today it contains over 55 million.

Air Liquide's partners in this technological adventure include fifteen major players in the electronics industry, such as Texas Instruments, STMicroelectronics, Toshiba, Micron, Sony, etc. These customers are provided with ultra-pure chemical liquids and gases requiring very high-tech processes. This is why the Group's offer goes beyond the supply of fluids to include equipment and facilities for distribution up to the point of use. Increasingly included is full management of these fluids, with Group teams based at the customer's site. This is the TGM* (Total Gas Management) or TGCM* (Total Gas and Chemical Management) concept.

ALWAYS AT YOUR SERVICE

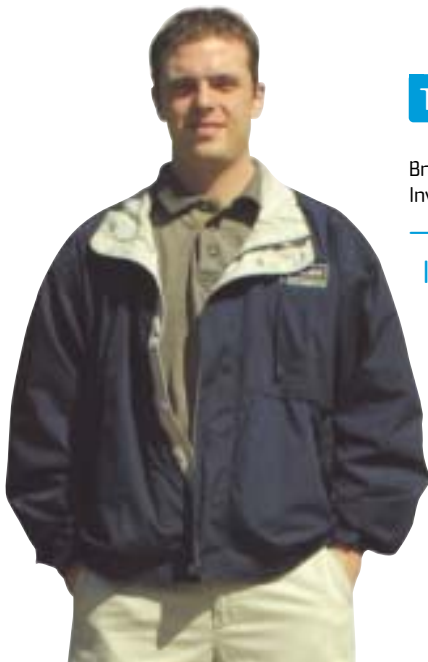
The TGCM* (Total Gas and Chemical Management) agreement signed in 2002 between Air Liquide and STMicroelectronics for its Carrollton (Texas) plant demonstrates two key points of the Group's electronics strategy: ongoing enlargement of its service offer in partnership with a key customer in international projects. Air Liquide is already STM's partner in France,

Morocco, China, Italy, and Singapore. This is the first time that this customer has entrusted complete management of chemical liquids and gases to a single company.

TESTIMONY

Brent Morgan
 Inventory Specialist at STMicroelectronics Carrollton

— "I was chosen as part of the Total Gas and Chemical Management Implementation Team for a new Air Liquide customer in the Dallas area - STMicroelectronics. The greatest challenge was supply chain continuity. Our team focused on establishing relationships with STM's core suppliers, managing logistics, and working toward a goal of lower on-site inventory. I feel proud to be a part of the successful Air Liquide team at STMicroelectronics."





> 300 mm FABs*
— The two 300 mm fabs* located in Europe chose Air Liquide as their partner. In 2001 it was Infineon (Dresden – Germany), and in 2002 the Crolles 2 project (near Grenoble – France) launched by STMicroelectronics in association with Phillips and Motorola. Air Liquide will supply this unit with all carrier gases and ultra-pure fluid distribution systems.



AN ONGOING REVOLUTION

Size matters, and one of the most recent developments in this constantly evolving market concerns “300 mm” - the size of the new-generation silicon wafers*. Significantly larger than their predecessors (200 mm), they are also much more efficient. A 300 mm wafer can support twice as many chips as a 200 mm wafer. 300 mm plants are being built everywhere, and in 2002 Air Liquide achieved a number of successes with new units in Europe and Asia.

Another technological development linked to the increasing miniaturization of microprocessors is the use of new materials allowing ever-higher performance chips to be manufactured. Air Liquide supplies new molecules, “advanced precursors”, and relevant distribution equipment.

Flat screen technology is developing quickly in consumer applications (computers, cell phones, TVs and many others). Manufacturing is concentrated in Japan, Korea and Taiwan, and uses technologies similar to those for chips, with the same need for extreme purity. In 2002, Air Liquide signed two major contracts in Taiwan with Toppoly and QDI, who are significant players in this market.

THE “GREEN FAB*” BECOMES A REALITY

Semiconductor manufacturing plants use and emit toxic gases, acids, solvents, etc. Respect for the environment involves treatment of such effluents and to respond to this requirement, Air Liquide has developed its “green fab” offer. This includes solutions for identifying and measuring waste gases, and for recovering, destroying or recycling them. These waste gases include the infamous PFCs (perfluorinated gases), which have a serious impact on the greenhouse effect*. In 2002, Air Liquide initiated the UPAS (Universal Plasma Abatement System) system for destroying PFCs using plasma*, which acts at their emission source, when chips

emerge from the fabrication process. UPAS destroys over 99.5% of PFCs emitted. It does so at a more competitive price and by using “clean” plasma technology rather than high-temperature methane combustion. This solution is available at a lower cost than current market technologies.



> Ricoh has already adopted the Air Liquide UPAS system for destroying PFCs at its Yashiro (Japan) plant



> FOCUSED ON CHINA

— The electronics business is rapidly expanding in China, particularly since the recent easing of Chinese legislation on imported technologies. A number of fabs* are under development, particularly around Shanghai, often in the form of joint ventures (Chinese and foreign investment). Air Liquide's presence in China consists of dedicated electronics teams. The Group signed a number of contracts in 2002, particularly with ASMC (a Philips subsidiary) and Belling.





healthcare



FROM HOSPITALS TO HOMECARE

Air Liquide's team of 5,600 people worldwide provides a number of services in the healthcare sector:

- In hospitals:
 - > medical gases, which are often classified as medicines
 - > hospital hygiene products and services
 - > cryopreservation fluids
 - > anesthesia, resuscitation and aerosoltherapy equipment
 - > related services
- In patients' homes:
 - > full range of homecare services, including devices/equipment and ongoing monitoring of patients, particularly for the treatment of respiratory insufficiency, sleep apnea syndrome and diabetes

— In hospitals and at patient’s homes, Air Liquide, with more than 250,000 patients, is the medical gases and respiratory care specialist.

HOSPITALS MEDICAL GASES AND HYGIENE

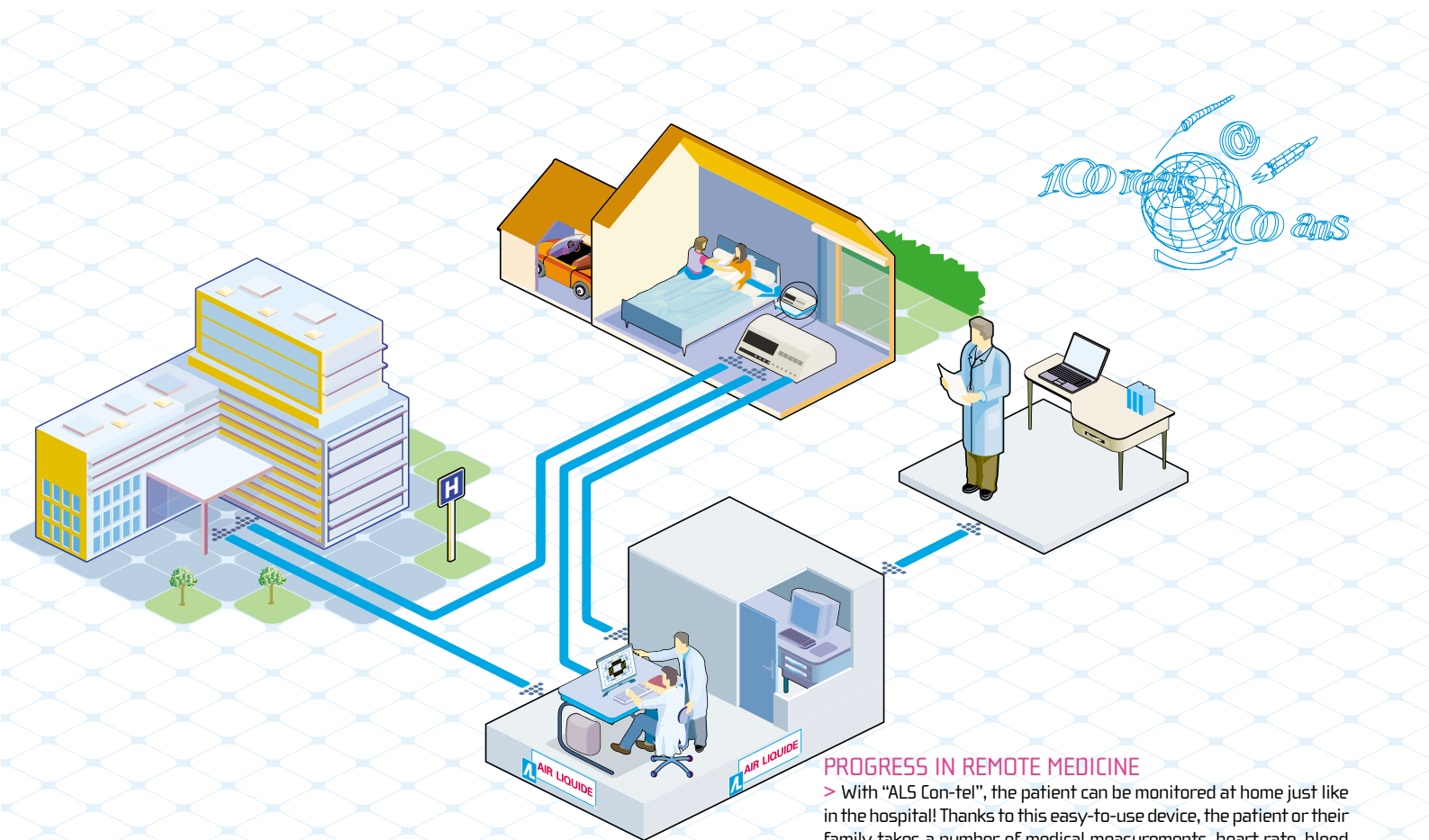
In 2002, Air Liquide continued to follow its pharmaceutical strategy for medical gases, which are classified as medicine in a growing number of countries, while also researching new therapeutic applications for gases and marketing new products. For example, marketing licenses were obtained in late 2001, early 2002 in France for Kalinox (management of pain caused by brief medical procedures) and Kinox (treatment of pulmonary arterial hypertension). Air Liquide is also developing a number of services to ensure that gases are continuously available to patients, either at the bedside or operating table. As always, the Group is seeking to do so under optimum conditions of safety and quality. These services include maintenance of installations and cylinder stock management. Training is also provided for caregivers.

Hygiene is the second critical area of Air Liquide’s offer to hospitals. The objective? To combat nosocomial infections, which are contracted during a stay in the hospital. This is currently a major concern for hospitals. They are demanding new solutions to guarantee hygiene for hands, surfaces, instruments and the air. Air Liquide is Europe’s market leader in hospital disinfection, supported by its specialized subsidiaries Anios, Schülke & Mayr, Seppic, and Omasa.

INSTRUMENT STERILIZATION

The sterilization of instruments used in a hospital environment is key to combating nosocomial infections. One of the latest products to be launched by Air Liquide, Anioxide 1000 is an endoscope disinfection product developed by its Anios subsidiary, to great acclaim in France in 2002. It is currently being marketed in other European countries. Another key point is the growing trend for hospitals to outsource sterilization of their instruments. This is a market in which Omasa, Air Liquide’s Italian subsidiary, can excel. Just one year after it joined the Group, Omasa’s sales are up 30%.





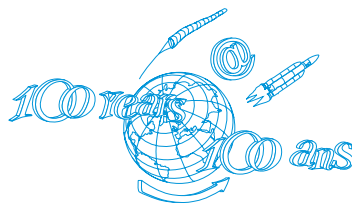
PROGRESS IN REMOTE MEDICINE

> With "ALS Con-tel", the patient can be monitored at home just like in the hospital! Thanks to this easy-to-use device, the patient or their family takes a number of medical measurements, heart rate, blood oxygen saturation, ventilation, arterial blood pressure, and so on, depending on the patient's specific requirements. The data is transmitted electronically to the hospital team monitoring the patient and, depending on results, doctors adjust treatment and, if necessary, call the patient in order to obtain further information. This service, which was developed by Air Liquide Sanita in Italy, won the Grand Prize at the special Innovation Contest held in conjunction with Air Liquide's 100-Year celebrations.



TESTIMONY

Victor Díaz
 Air Liquide Spain – 100-Year Innovation Trophy
 "Services" category



Cryobiology: a complete service

— "The National Cancer Research Center in Madrid works on a wide variety of cryogenically preserved biological tissue. For this customer we designed a customized solution combining equipment and services: liquid nitrogen storage, optimization of preservation unit filling, safe specimen handling, continuous remote monitoring and a complete, updated database of tens of thousands of specimens."



HOMECARE

In 2002, Air Liquide treated more than 250,000 patients worldwide in their own homes for respiratory insufficiency, sleep apnea syndrome, diabetes, and other medical disorders. Due to several factors, there is an increasing demand for homecare services in many countries. Examples include: continuous medical advances, pressure to reduce healthcare costs and increased life expectancy.

Principally through VitalAire and Orkyn, Air Liquide's homecare business is growing by approximately 8% per year. It consists mostly of respiratory assistance services (oxygen therapy, treatment for sleep apnea syndrome, ventilation, or aerosoltherapy). The Group's offer covers not only the supply of oxygen and specialized equipment, but also a number of other services: flexible and

rapid emergency service available 24/7, administration management, patient and family training - all in close collaboration with medical teams and reimbursement institutions.

Increasingly, the Group's offer is extending to incorporate new services, such as perfusion, enteral nutrition (via the esophagus or abdominal wall) or parenteral nutrition (intravenous), and also providing insulin pumps for treating diabetes. The driving objective is to provide patients with quality services.

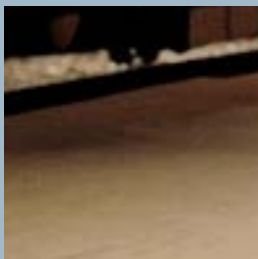
EXCELLENCE AWARD FOR OCTENISEPT

Octenisept is an antiseptic spray for wounds and minor injuries sold over-the-counter in German pharmacies. This new product from Schülke & Mayr, an Air Liquide Santé subsidiary specializing in disinfection solutions, has been ranked number one in its category on two occasions. It has been described as "excellent" in tests conducted by the environmental consumer magazine Ökotest. Sales are also strong, exceeding 9 million euros in 2002, the fifth year that the OCTENISEPT range of products has been on the market.





related activities



INNOVATION IN COMPLEMENTARY DOMAINS

Air Liquide's core expertise in gases includes:

- > welding-cutting
- > engineering and construction
- > space
- > specialty chemicals
- > diving

WELDING-CUTTING >

This field of Air Liquide's expertise includes the sale of welding/cutting equipment, consumables (electrodes, wires, and flux), and related services and is primarily concentrated in Europe at Air Liquide Welding. The railroad construction sector is a particularly strong growth market thanks to new investment in intercity or intracity public transportation in emerging countries.

Air Liquide Welding's global offer includes solutions facilitating significant gains in productivity, such as the topmag (two-wire, gas-shielded) welding process, which allows welding speed to be doubled.

ENGINEERING AND CONSTRUCTION >

Through its network of 1,400 employees working at five different platforms worldwide (North America, Japan, India, China and France), Air Liquide Engineering designs and constructs gas-production plants for both the Group and external customers. Current projects include the development of a new design for air-gas separation-unit distillation columns in order to increase their capacity.

The Advanced Technology Division, which specializes in applications at very low temperatures, develops high-tech cryogenic equipment for research institutes and the aeronautics industry. In 2002, it signed a contract with the US Air Force for the supply of 400 mobile oxygen generators.

SPACE >

The Group is the principal supplier of industrial gases and related services for the European space program, with a subsidiary providing services at the Ariane launch site in Kourou (French Guiana). Through its Cryospace subsidiary, Air Liquide manufactures the hydrogen and oxygen tanks for Ariane 5. The Advanced Technology Division provides additional equipment for the rocket, and is developing various satellite systems (helium tanks in particular).

SPECIALTY CHEMICALS >

This side of Air Liquide's business is covered essentially by Seppic, and is centered around the production of surface-active agents*. These products are used primarily in cosmetics, pharmaceuticals, and for special industrial purposes. Cosmetic applications (primary market) recorded strong growth in 2002.

DIVING >

Through its Aqualung subsidiary, Air Liquide offers a wide range of equipment and products for professional and recreational diving. Growth continued in 2002, despite a difficult period. It also developed a new line of aquatic equipment, an area in which its market share is growing rapidly.