
Mergers & Acquisitions in the US Industrial Gas Business

PART II – THE MAJOR INDUSTRY SHAPERS

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The Industrial Gas (IG) industry has seen tremendous growth over the past 100 years, fueled by rapidly expanding technology in market leading countries that required more mixes of gases (including the exotics), purer gases for high-tech applications, as well as new applications of traditional gases. With the development of industry in emerging economies, demand for industrial gases continues to grow worldwide. This is Part II of this series that examines mergers and acquisitions activity in the industrial gas business. In this feature we look at some of the “majors” and how they have grown over the years through acquisitions. In compiling this article, we researched the websites of many of the companies mentioned herein, had access to the archives of JR Campbell Associates, Inc., along with discussions with Buzz Campbell, and used *The History of Industrial Gases*, by Ebbe Almquist as our primary reference for historical facts.

AIRCO

A major industry shaper in the US, albeit no longer a stand alone, is Air Reduction Company or Airco. In Europe, the economic potential of the oxyacetylene process captured the attention of several prominent investors, including Percy Rockefeller — nephew of John D Rockefeller. In 1908, after years of research and discussion, Rockefeller and Air Liquide investors formed the American Oxygen Company. In 1914, Air Liquide (the company formed in 1902 to manufacture high-purity oxygen from air) began talks with American Oxygen Company to use its liquefaction process for the production of oxygen in America.

American Oxygen bought liquefaction, distillation and oxygen compression equipment from Air Liquide and built its first plant in Philadelphia in 1915. Production sold out in two months. The success of the Philadelphia plant convinced the investors to build five additional oxygen plants in major industrial cities, Brooklyn, Newark, Pittsburgh, St Louis and Chicago, with Air Liquide providing the equipment.

On November 16, 1916, the Air Reduction Company was officially chartered from American Oxygen and Air Liquide, and began producing and marketing high-purity oxygen. This company, later to become Airco, was to have a big influence on another major, BOC, many years later.

BOC

As noted in Part I of this series, (see “Decades of Deals”, *Cryogas International*, August/September 2006), BOC was one of the first major industrial gas companies in the world. Arthur and Leon Brin formed the Brin’s Oxygen Company Ltd. after taking out patents for

a process to separate oxygen in 1880. In 1886 the brothers Brin started commercially developing the use of oxygen.

Interestingly, one of BOC’s first mergers — and now its last — was with Linde. In 1906, Linde joined with Brin Oxygen by contributing its British Linde patents. These patents represented a new method for producing oxygen by cryogenic distillation of air. The resulting merged entity was renamed British Oxygen Company or BOC. In the 1920s, a process for the large-scale production of liquid oxygen allowed the oxygen to be delivered in liquid form by road tanker and greatly expanded its market applications.

BOC’s growth in the first half of the 20th century was achieved largely by developing or acquiring rights to new technology and processes, including further improvements in liquefaction and cryogenic cooling in the 1930s. In the US, joint ventures with Airco and Big Three for various applications further fueled growth in the 1960s and 1970s. Geographic expansion through acquisitions was also extensive for BOC at this time, most significantly BOC’s hostile takeover of Airco in the US in the late 1970s. In the late 1990s, BOC has made some very strategic acquisitions and divestitures, including the sale of their \$240 million US packaged gas business to Airgas in 2004. But by September of 2006

BOC has ended its M & A activities with the merger of its global operations into Linde AG — its merger partner of 100 years ago.

LINDE

In 1879, Carl Von Linde founded the “Gesellschaft fur Linde’s Eismaschinen” or the “Company for Linde’s Ice Machines.” However, it was not until 1907, after years of being embroiled in a dispute for American patent rights for his cryogenic air liquefaction plant design and later for other patent rights, that Linde was able to establish the Linde Air Products Company in the US in 1907.

In 1916, when it was apparent the US was entering World War I, the German Linde company was required to divest its shares of Linde Air products. At that time, Union Carbide and Carbon Corporation (UCC) took over Linde Air Products and the German company lost the rights to the Linde name. The rights to that name were reacquired in 1999 when it repurchased these rights from UCC’s spin-off, Praxair. Subsequent to losing the Linde name in the US, Linde operated under the name Dominion Oxygen Company in Canada beginning around 1918.

Between the 1970s and 2000, Linde expanded in many markets such as industrial lift trucks and material handling equipment, technical gases, and commercial refrigeration. Linde did this through acquisitions. One such acquisition in the US was the take over of Sunox,

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Inc. of Charlotte, NC, by Linde's Dutch subsidiary Hoek Loos through its Atlanta-based subsidiary, Holox, Inc. Another was the acquisition of medical gas provider, Life Gas in Texas.

In 1996 Linde purchased ProQuip Corp. of Tulsa, OK, which, through its ownership of HydroChem, was a world leader in small hydrogen plants. The Tulsa location became the center of US activity when Linde moved its subsidiary Lotepro, Inc., there from New York and merged the two in 2001 to form Linde Process Plants. In 2002, BOC merged its Cryo Plants division into Linde process plants for a 30 percent interest in the new Linde BOC Process Plants LLC.

In the 1990s, Linde acquired the Swedish industrial gas company AGA, AB. This acquisition made Linde the fourth largest gas supplier in the world. AGA was already a major regional player in the US having purchased Burdiox of Cleveland, OH in the late 1970s.

In December 2005, after several acquisitions of independent distributors, Linde announced the acquisition of the specialty gas company Spectra Gases of Branchburg, NJ. In September of 2006, Linde AG closed on the purchase of the entire ownership capital of The BOC Group, including all of its assets in the US.

PRAXAIR

The first company in North America to commercialize cryogenically separated oxygen became today's Praxair. Praxair emerged as a major industrial gas player from a series of mergers and acquisitions that began in 1907 when the Linde Air Products Company was bought by Carl von Linde and American partners, as discussed above. In 1917, the Union Carbide and Carbon Corporation (UCC) formed and absorbed Linde Air Products. UCC grew the Linde business through technology advances and through acquisitions such as Purox in 1929. In 1957 the Air Products part of the name was dropped and in 1963 it became known simply as the Linde Division of the Union Carbide Corporation.

After the Bopal incident in India, UCC's Linde division was spun off to UCC shareholders as Praxair. Shortly after that, Praxair stated it would buy back some of its packaged gas operations which had been sold as part of the UCC restructuring after Bopal. In 1995 Praxair purchased CBI, for the merchant gas and CO₂ value of its Liquid Carbonic Inc, subsidiary.

Praxair acquired the packaged gas business and facilities of Constar LLC in December of 2005, for a purchase price of \$31 million. The Constar business included ten facilities in Georgia, Tennessee and South Carolina, which fill and distribute high-pressure industrial, medical and specialty-gas cylinders and other gas containers. This acquisition facilitated Praxair's expansion into a new geography.

In June of 2004, Praxair acquired 100 percent of the outstanding common shares of Home Care Supply, Inc. (HCS) for a purchase price of \$245 million. Headquartered in Beaumont, Texas, HCS was one of the largest privately held homecare respiratory services and medical-equipment providers in the US. The acquisition expanded Praxair's home-healthcare presence from the mid-Atlantic to Texas.

AIR LIQUIDE

Georges Claude and Paul Delorme founded Air Liquide in France in 1902, with their invention that successfully liquefied air. Air Liq-

uide (AL) now has 130 subsidiaries in over 70 countries, reaching the centennial mark in 2002. The AL history is peppered with alliances and contracts with now well known names such as, Louis Renault, Werner von Siemens, Daimler-Benz, and Austria's Ferdinand Porsche with his 'peoples' car, the Volkswagen. Rapid expansion occurred in Europe under the philosophy it was more cost-effective to install plants close to where the oxygen was needed and used. Air Liquide formed its first joint venture in America with Airco in 1914.

In 1930, AL had strong growth from the invention of the oxyacetylene torch, and other cutting and welding tools. SAF was an early company in this field, which grew to be a world leader, becoming the second largest of its type in Europe. AL acquired SAF in 1995. In 1947, AL was involved with Jacques Cousteau in the development of the Self Contained Breathing Apparatus or SCUBA gear, later to be sold under the Aqua Lung brand.

The 1960s saw worldwide growth through increased plant technology developments and installations. In the US, Air Liquide acquired a number of gas companies including American Cryogenics. AL acquired Big Three in the 1970s. In 2004, Air Liquide finished its acquisition of Messer Greishiem's industrial gas divisions in Germany, the UK and the US. AL immediately divested the US distribution businesses of Messer. The first divestiture was the Messer Gas Technology & Services Group, now GT&S, which was sold to a management buy-out group (see "The Management Buyout — Anatomy of a Deal", *Cryogas International*, October 2005) in a \$80 million transaction where Leaders LLC advised the management team. AL later sold the Constar distribution business in the South-eastern US to Praxair.

AIR PRODUCTS

Leonard P. Pool founded Air Products in 1940 in Detroit, Michigan to design and build small oxygen plants to replace large volume cylinder oxygen supply. The company grew over the years organically as well as through acquisitions to become a global presence with operations in over 30 countries and with current annual revenues of over \$8 billion.

Innovative from the start, AP was one of the first to introduce the "on-site" concept of producing and selling industrial gases, primarily oxygen. The company grew over the years seeing expansion during the war and then post war growth in commercial business, including the emerging missile and space programs. AP built oxygen plants adjacent to large volume gas users such as steel mills and shipyards and supplied the gas "over-the-fence" under long-term take/pay contracts.

In the 1960s AP acquired the Houdry Process Company and its subsidiary, the Catalytic Construction Company. Houdry had an international reputation in process licensing and production and sale of certain organic chemicals and catalysts. They further expanded their position in both chemicals and industrial gases and acquired the chemical and plastics business of Airco in the 1970s.

During this time major investments were made in industrial gases in Western Europe, Brazil, Asia and in the US. Additionally, cryogenic equipment, process, engineering related services were all advanced through acquisitions. Their resulting notable technical achievements have made their process design and heat exchangers for LNG preeminent around the world.

In the 1980s, AP acquired Separax Corp, a manufacturer of membrane gas separation systems, and the J. C. Schumacher Co., a supplier of high purity chemicals for the semiconductor industry. In the 1990s AP continued expansion globally, often through joint ventures or by acquiring partial interests in other companies. With Air Liquide, AP tried to acquire BOC's assets in 1999 but failed to get regulatory approval in the US or Europe and the deal fell through.

In 2002, AP acquired American Homecare Supply (ASHS) one of the ten largest homecare providers in the US. AP has also made several additional acquisitions in the home health arena through ASHS. This is an area they believe will be a strong growth for the industry.

NIPPON SANSO

Founded by Takehiko Yamaguchi in 1910 as the Nippon Sanso Limited Partnership the company began producing oxygen in 1911. By 1934 they had established a plant to manufacture air separation plants. Further growth occurred in the production of liquid oxygen in 1954, establishment of the first on-site air separation plant in Japan in 1964, and the world's first ASU using LNG front end refrigeration in 1971 (Tokyo Liquefied Oxygen Co., Ltd.). It was not until 1980 that the company ventured overseas to have a physical presence through a subsidiary, Japan Oxygen, Inc., in Long Beach, CA. The first US acquisition was made in 1983 to expand their specialty gas business by purchasing a 50 percent interest in Matheson Gas Products, Inc., which was very strong in core specialty bases and specialized in semiconductor gases and gas systems. Later in 1989 Nippon Sanso acquired 100 percent ownership of Matheson, however, the company did not start a

comprehensive merchant gas business unit in the US until after the purchase of Tri-Gas Inc. in 1992. To facilitate their efforts in expanding their comprehensive industrial gas business Matheson Gas Products, Inc. and Tri-Gas Inc were merged to form Matheson Tri-Gas Inc. (MTG)

In 2004 Nippon Sanso and Taiyo Toyo Sanso merged to form Taiyo Nippon Sanso Corporation (TNSC) with their sights focused on becoming a global leader in the industrial gas industry. (Taiyo Sanso and Toyo Sanso were Mitsubishi owned gas companies that merged into Taiyo Toyo in 2000.) To that end, they continue to acquire or merge with entities such as Hitachi Oxygen, Nippoku Sanso K.K. and companies in the medical gases and equipment fields. In 2004 MTG acquired the six ASUs that Air Liquide was required to spin-off in its acquisition of the Messer Greishiem's US assets.

In our next article, we will take a look at the acquisition activity of regional players and large gas distributors, including Airgas.

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