



electronicsupdate

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Air Products San Fu Company Ltd. Announces Two Major Contracts For Manufacturing Facilities in Taiwan

Air Products continues to grow market share in Asia as evidenced through its subsidiary Air Products San Fu Co. Ltd. in Taiwan, which recently signed two key contracts, including a SunSource™ Solutions one with a new PV manufacturing facility and another with one of the largest TFT-LCD makers.



The first contract is for providing nitrogen to NexPower Technology Corporation's (NexPower), new thin-film PV facility in the Central Taiwan Science Park (CTSP) in Houli in Taichung. Air Products is supplying nitrogen to NexPower's facility through its pipeline network in the CTSP.

The second contract is with Chi Mei Optoelectronics (CMO), the world's fourth largest TFT-LCD supplier, to provide nitrogen and bulk gases to their Fab 6 located in Tree Valley Science and Industry Park (TVSIP) in Tainan.

Last year, Air Products won more than 20 new contracts in Asia serving both the crystalline and thin-film PV markets and has since signed gas supply contracts not only with NexPower, CMO, and Green Energy Technology in Taiwan, but also with Best Solar and CHINT Solar in China and HHV Solar and Jupiter Solar in India.

NexPower, founded by the UMC Group in 2005, is a leading global semiconductor foundry and a world-class thin-film PV manufacturer in Taiwan with its own product development, R&D, and manufacturing. By ramping up to 100MW within only 18 months, NexPower is one of the first Taiwan companies to achieve successful thin-film mass production.

NexPower is the first Taiwan company to begin thin-film PV mass production, and the first to attain IEC 61646 and IEC 61730 certification and UL 1703 listing.

"Air Products is excited to be NexPower's gas supply partner. This new contract demonstrates our leading position in the thin-film PV market and is a testimony to our capabilities to enable a fast ramp up to meet customers' needs," said Corning Painter, Air Products' vice president and general manager, Global Electronics Division.

The CTSP, which includes Taichung, Houli, Huwei, and Erlin park stations, is one of the two new government-sponsored science parks in Taiwan to attract investments and the development of high-tech industries to the central Taiwan district.

For CMO Fab 6, Air Products San Fu has installed an air separation unit next to it to provide on-site nitrogen. Air Products also will supply bulk gases including oxygen, argon, helium, hydrogen, and carbon dioxide to CMO and other customers in the TVSIP.



Air Products India JV Signs Two Photovoltaic Contracts



Air Products has gained a foothold in the emerging PV market in India with its India joint venture—INOX Air Products Ltd.—signing new contracts with two leading PV

manufacturers there for the company's SunSource™ Solutions gases and materials.

INOX Air Products has signed a long-term gas supply contract to provide bulk and specialty gases to HHV Solar Technologies Pvt. Ltd (HHV Solar) at its new thin-film PV fab in Bangalore. The contract calls for the supply of hydrogen, nitrogen, oxygen, and argon, as well as specialty gases, including silane, methane, and dopant mixtures. In addition, INOX Air Products will provide total gas management at HHV Solar's research, development, and demonstration fab.

INOX Air Products is supplying Jupiter Solar Power Ltd, a subsidiary of Jupiter International, with specialty gases, including nitrogen, oxygen, silane, and ammonia, to its new PV facility at Baddi in Himachal Pradesh. Jupiter Solar Power Ltd is setting up PV solar cell manufacturing facilities in Himachal Pradesh and West Bengal at an aggregate investment of Rs 1,500 crore (~US\$300 million).

"India is an emerging PV market with strong support from the government. We are honored to be selected as the supplier for these two PV projects in India," said Corning Painter, Air Products' vice president and general manager, Global Electronics Division. "We are in a better position to support the fast-growing Indian solar energy market with these two contract wins."

India—thanks to its embracing of new technologies and strong demand for renewable energy—is rapidly emerging as an important PV market. In addition, many regions of the country experience significant sun irradiation, or prolonged exposure to strong levels of sunlight, which can help cheaply power remote areas that are without access to the power grid.

CONTACT Dave Taviani: taviand@airproducts.com

Air Products Extends XeCoveySM Xenon Recovery Service to MEMS Manufacturers

The use of xenon difluoride (XeF₂) in etching processes is gaining increased acceptance by manufacturers of MicroElectroMechanical Systems (MEMS). However, the relatively high cost of the material continues to be a barrier to more widespread adoption.

Now, Air Products has extended its XeCoveySM Xenon Recovery Service to recover xenon from XeF₂-based etching processes, which will help stabilize and even lower the price of XeF₂, reported Gene Karwacki, commercial development manager for XeCovey at Air Products.

Karwacki introduced this latest addition to the XeCovey Xenon Recovery Service at the SEMICON West 2009 Extreme Electronics TechXPOT.

"Pricing for XeF₂ is strongly influenced by the availability and pricing of xenon," said Karwacki.

"For users and those considering using XeF₂ for a MEMS process, XeCovey enables a more stable and lower cost structure for the material required for their process," he added.

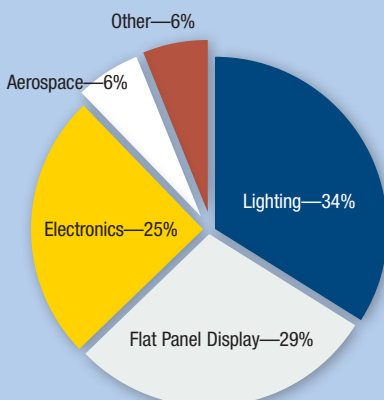
XeCovey Xenon Recovery is an on-site service that extracts xenon from process effluent streams. An enriched mixture of recovered xenon is compressed and stored. Full vessels are then transported offsite for distillation.

Air Products assumes responsibility for owning, operating, and maintaining the units placed at a site, which limits a customer's investment only to costs associated with installation and utilities to operate the equipment.

Links to Gene's podcasts: www.airproducts.com/podcasts

CONTACT Gene Karwacki: karwacej@airproducts.com

New Applications are Increasing the Worldwide Demand for Xenon



Air Products Has High K Dielectrics Market Covered

Fundamental chip design is dramatically evolving with the use of new dielectric precursors to build transistors and capacitors in advanced devices. Technological breakthroughs produce transistors with record-breaking performance, while consuming less power, and allow storage of huge amounts of data on ever smaller areas of silicon.

High K Dielectrics

Using alternative High K dielectric precursors rather than traditional silicon dioxide preserves the desirable high capacitance that is key to these devices' outstanding performance.

Air Products' Hf and Zr precursors have been fully tested with leading OEMs and IDMs, and are already in High Volume Manufacturing (HVM).

These precursors can be deposited as metal oxides or metal silicates; in the latter case a suitable silicon precursor is also employed.

- Hafnium precursors
- Zirconium precursors
- Silicate precursors

Ultra-High K Dielectrics

Further device miniaturization and performance enhancement requires the development of films with yet higher dielectric constants, lower leakage, and improved deposition properties.

Air Products is ready to support manufacturer's needs for:

- Titanium precursors
- Strontium precursors
- Yttrium and Lanthanide precursors

Electrodes and Conductors

Many of these High K dielectrics require the use of electrode materials containing Ti, Ta, Ru, and other metals. Contact us to find out what we can offer as electrode deposition precursors.

Phase Change Alloys

New technologies that store data through resistance changes are being developed and one of the most promising is PCRAM. This employs a special alloy such as GST and Air Products has developed precursors to enable deposition of these alloys by CVD or ALD.

- GST Precursors

Equipment

Air Products offers a complete line of gas and chemical delivery systems featuring our GASGUARD[®] and ChemGuard[®] delivery systems.

High K and Ultra-High K precursors are often air sensitive and have low volatility, making the ChemGuard CG500 system especially appropriate for their delivery.

For more details, visit: www.airproducts.com/Electronics/Technologies/High-K.htm

DuPont Apollo Signs SunSource[™] Solutions Turnkey Gas Contract

DuPont Apollo (Shenzhen) Limited has signed a turnkey gas supply contract for Air Products' SunSource[™] Solutions liquid bulk and specialty gases, related gas distribution equipment, and engineering services for its new amorphous silicon thin-film PV facility in GuangMing New District, Shenzhen, China.

The contract includes the long-term supply of nitrogen, hydrogen, argon, oxygen, and specialty gases, such as silane, as well as phosphine mixtures and other dopant gases. Air Products also has installed complete gas distribution systems from its source containers to the point of use within DuPont's Shenzhen facility.

DuPont has long been a leading supplier of PV materials, primarily serving the crystalline silicon cell and module markets, and is building a new research center in Hong Kong and a manufacturing facility in Shenzhen to support the emerging amorphous silicon, thin-film PV market. As a leading supplier to the TFT-LCD and other electronics industries, Air Products is ideally suited to supply large PV fabs like DuPont's new facility.

CONTACT Arifin Budihardjo: budihaa@airproducts.com

24th European Photovoltaic Solar Energy Conference and Exhibition Closes with New Record Figures

Many new trends and developments in photovoltaics were presented and up for discussion during five busy days at the 24th European Photovoltaic Solar Energy Conference and Exhibition held in Hamburg in September.

Nearly 950 international manufacturers, suppliers, and service providers covering every aspect of PV took part as exhibitors, attracting more than 40,000 visitors. The share of international visitors amounted to more than 50 percent. Air Products showcased its comprehensive portfolio of SunSource™ Solutions for global PV manufacturers.

PV General Manager Jeff Handelman was chief spokesman, including being featured in *Power & Energy Solutions* magazine, Europe Edition, Issue 12 for 2009. In the article, he described the company's SunSource Solutions portfolio for PV manufacturers.

"The plants we see being built are now in the 100MW range, up from single digits just a few years ago. In growing to that size, PV manufacturers will encounter difficulties Air Products has already helped solve in the semiconductor and TFT-LCD industries. We are the industry leader in large-volume supply chain solutions," said Handelman. "We bring that expertise to help drive down the cost of ownership for manufacturers.

"With the advent of thin film silicon manufacture, the need for bulk supply of silane and NF_3 has become a basic requirement...We have the largest BSGS fleet in the world and we are the largest NF_3 producer."

The company also presented a technical paper, "The Choice of Cleaning Gas for PECVD Chambers: Improving Cost of Ownership and Minimizing Environmental Impact" authored by Mark Sistern, Robert Ridgeway, and Dave Taviani.

The European PVSEC is the largest trade show in the PV industry, and also the one with the highest number of operational exhibits. The conference attracted nearly 4,300 delegates.

According to conference organizers, among the many topics covered, debate centered on new cell concepts for the future, increased automation in production, and standardization. New manufacturing processes and production machinery for silicon and thin-film technology were showcased on the 65,000 sqm (700,000 sq. ft.) exhibition area.



Air Products booth at the 24th PVSEC in Hamburg attracted many visitors.

Numerous exhibitors even displayed entire production lines, some of them operating. Cutting-edge measurement and control equipment for quality assurance in cell manufacturing was also unveiled. Production samples of large panels of glass with a PV finish illustrated the rapid advances being made in the field of thin-film solar technology.

All PV areas also were covered in more than 1,300 plenary and specialist presentations, as well as visual poster presentations. Papers on the new organic PV cells generated particular interest.

At the 6th European PV Industry Forum held on Sept. 23, the results of the European Photovoltaic Industry Association's and AT Kearney's study 'SET for 2020' were released. The study establishes a vision for the PV industry to achieve a market share of up to 12 percent in the electricity sector in Europe by 2020. Moving towards smart cities, designing smart grids, the role of energy storage and the breakthroughs in electric vehicles were all emphasized as areas where the PV industry should work together in close collaboration with the other relevant industries to achieve this 2020 goal.

Next year's 25th European Photovoltaic Solar Energy Conference and Exhibition will be a joint conference with the 5th World Conference on Photovoltaic Energy Conversion, which will unite the three most important scientific and strategic conferences for the global PV solar sector—the 25th European Photovoltaic Solar Energy Conference and Exhibition, the 36th US IEEE Photovoltaic Specialists Conference, and the 20th Asia/Pacific PV Science and Engineering Conference. The joint event will be held at the Feria Valencia in Valencia, Spain, from Sept. 6 through 10, 2010.

CONTACT Dave Taviani: taviand@airproducts.com



Air Products San Fu Co. Ltd. Announces Two Major Contracts For New PV Manufacturing Facilities in Taiwan (cont. from page 1)

TVSIP is located adjacent to Tainan Science Industry Park (TSIP), one of the largest technology parks in the world. Administered by the Tainan County Government, TVSIP is a TFT-LCD industrial park with a cluster of related producers including glass, backlight module, and television assembly manufacturers.

"CMO has been a long-standing customer for Air Products, and we are honored to be selected to support the needs of this leading TFT-LCD supplier," said Painter. "Our facilities in TVSIP and TSIP will further enhance our capabilities to

provide reliable, flexible and cost-competitive solutions to meet the requirements of our customers in the two parks."

Air Products San Fu has established a leading supply position in TSIP, and its customers in the park include CMO's Fab 3, Fab 4, Fab 5, and Fab 7; TSMC's Fab 6 and Fab 14 Phase One and Phase Two; and United Microelectronics Corporation's (UMC) Fab12A. Air Products San Fu serves its customers through large ultra-high purity (UHP) bulk gas facilities and a pipeline that is fed by the world's largest UHP nitrogen facility. This plant also produces UHP liquid nitrogen

and UHP liquid oxygen for other semiconductor customers.

Air Products San Fu is a leading producer of industrial gases in Taiwan, supplying atmospheric gases, electronics specialty gases, chemicals and related equipment for many industries. Air Products San Fu is one of "The Top 200 Companies" in Taiwan and is the first gas company in Taiwan awarded ISO9002 and ISO14000 certifications.

CONTACT Dave Taviani: taviand@airproducts.com

Air Products Playing Important Role in Evolving EPD Technology and E-books

Air Products is playing an important role in the evolution of the electronic or e-books that are dramatically changing the way we read. Mainstream acceptance is building, with the release of many new products, and e-books—part of Electronic Paper Display (EPD) technology—are here.

E-books, such as the Amazon® Kindle™, the Sony Reader™, and the Barnes and Noble nook™, allow readers to download books and other media via wireless modem onto a paperback size reader.

An EPD is a display that possesses a paper-like high contrast appearance, ultra-low power consumption, and a thin, light form. It gives the viewer the experience of reading from paper, while having the power of updatable information.

EPDs are a technology enabled by electronic ink—ink that carries a charge enabling it to be updated through electronics. Electronic ink is ideally suited for EPDs as it is a reflective technology that requires no front or backlight, is viewable under a wide range of lighting conditions, including direct sunlight, and requires no power to maintain an image.

John Ivankovits, Business Development manager for the Electronics Division, said Air Products made a strategic investment in 2001 in the start-up company E Ink® Corporation (www.eink.com), which had the beginnings of a new display technology, now the leading technology used in e-books, cell phones, and watches. Air Products brought to the relationship its capabilities in polymer science, electronics materials, and applications development.

Together, the two companies created the enabling materials E Ink needed, including inventing materials to solve unique integration requirements. “By 2006, we had completed both the technical development and scale-up manufacturing of the products and we went commercial,” said Ivankovits.

Today, E Ink manufactures its Vizplex™ imaging film for use as an optical component to make EPDs and is the leading developer of electronic ink display materials. E Ink’s success has led to its acquisition by Prime View International, the world’s highest volume supplier of ePaper display modules.

As with many new technologies, the market is always changing as products evolve. Originally a hard wired device for content delivery, today, the Barnes and Nobles, Amazon, and Sony e-readers all link to the Internet via wireless 3G technology to a broad range of books, magazines, and newspapers. They allow the reader fast connectivity and convenient delivery of new content.

Ivankovits said that for Air Products, the partnership with E Ink has brought real growth for its electronic polymers product line and its Electronic Materials portfolio.

“We expect the technology to continue to be successful as e-books evolve, with color versions targeted for release in 2010, and as new devices, with larger displays, are released. These large area devices, which create form factors similar to newspapers, will continue to make reading easier,” added Ivankovits.

A spokesperson for E Ink said that beyond today’s generation of technology that offers the visual look of paper (in terms of contrast, brightness, and viewing angle), future versions will integrate E Ink’s flex-ready products with plastic electronics being developed by several companies including a Philips spin-off called Polymer Vision, Epson, and UK-based Plastic Logic. The integration of these two technologies will allow something that not only has the look of paper, but is also much closer to its form—thin, light, flexible, rollable.

The vision of E Ink is to combine these attributes to create RadioPaper™, a lightweight, flexible display with the readability of ink on paper, but with the added benefit of digital technology to download newspaper headlines or a best-selling novel at the user’s command—providing information to anyone, anywhere.

In the future, according to the spokesperson, clothing, buildings, household objects, and information appliances all will have the ability to communicate. Ultimately electronic ink will permit most any surface to become a display, bringing information out of the confines of traditional devices and into the world around us.

CONTACT: John Ivankovits: ivankojc@airproducts.com



Air Products' Carlsbad, Calif. facility recently hosted a certification drill for fire and hazmat team members from the U.S. Marine Corps Base at Camp Pendleton in nearby Oceanside.

Carlsbad Facility Hosts Hazmat Drill with Marine Firefighters

Members of the fire and hazmat teams from the U.S. Marine base at Camp Pendleton, Oceanside, Calif., participated in a state certification hazmat drill at Air Products' Carlsbad, Calif., facility in September.

Twenty-eight firefighters, including others from the San Diego City and Barstow fire departments, participated in the event, part of a six-week, 240-hour training program for California Hazmat Response Certification.

As part of the scenario, the Camp Pendleton hazmat team members and firefighters responded to the staged chemical incident, and their challenge was to contain the situation and work with the individuals involved in the incident. They set up a command structure, rescued and treated the downed employee (in this case, a mannequin), and decontaminated the area.

Equally important—and standard procedure for responding to such an incident—was that the responders had to find out the nature of the chemical to assure that its release did not affect other employees, the surrounding community, and the environment.

Air Products' safety specialist Carol Maxwell reported that all those participating received their certification. “The safety of our employees, community and environment are of the utmost importance to Air Products. We have hosted many of these drills with our local community emergency responders and we look forward to holding many more.”

CONTACT: Carolyn Neilson: neilsoc@airproducts.com

Air Products' BPS Chemistries Improve Wafer Dicing

For dicing, Air Products' BPS (Better Process Solutions) chemistries effectively remove saw residues (swarf) through better wetting, while also removing metal oxides from bond pads and bumps, and mitigating their regrowth.

BPS products are aqueous solutions that are made for cleaning applications in electronics test, assembly, and packaging—specifically to improve yields at probe/test, as a dicing solution, allowing flux-less bump reflow, and reducing no-sticks at wirebond—all on a variety of substrates.

BPS solutions have extremely low etch rates on commonly used substrates in the industry, selectively removing metal oxides, fluorine, organic residues, and particulate contaminants

BPS products can be safely used on a variety of materials including PCBs, WLCSP, CSP and flip-chip to remove oxides from pads and bumps of Al, Cu and Sn/Pb—while causing no damage to base metals and substrates such as Si, GaAs, InP, and passivation layers.

The BPS-729 series products offer important advantages as dicing solutions.

They are surfactant-containing aqueous solutions that are injected into the DIW stream as you dice. Featuring low-foam, high conductivity, and a two-year shelf life, BPS-729 series products can help eliminate the need for CO₂ sparging.

Depending on your application, BPS-729 series products can work at dilutions as low as 1000:1 in DIW, reflecting in a lowered cost of ownership.

The BPS-729 series reduces kerf, chipping, and burring on various substrates including silicon, ceramics and BGA, with proven stability in closed-loop recirculation systems. BPS products contain no PFOS, mineral oils, silicones or dioxins, and are compatible with commonly used blades and materials of construction.

BPS-729-B is a super-low-resistivity dicing solution especially suitable for static-sensitive devices. Electrostatic discharge (ESD) can damage vital components on a product and also increase the accumulation of residues during dicing. BPS-729-B reduces the resistivity of the dicing solution by orders of magnitude and substantially lowers surface tension even at 1000:1, allowing



Air Products' Better Process Solutions (BPS) wet chemistries are an efficient and simple way of removing metal oxides, fluorine, particulate contamination, organic residues, and flux from wafers with out damaging the underlying metals.

more cooling water to enter deep cuts, cool the blade, and effectively carry away swarf. It can be used at dilutions between 200:1 and 1000:1.

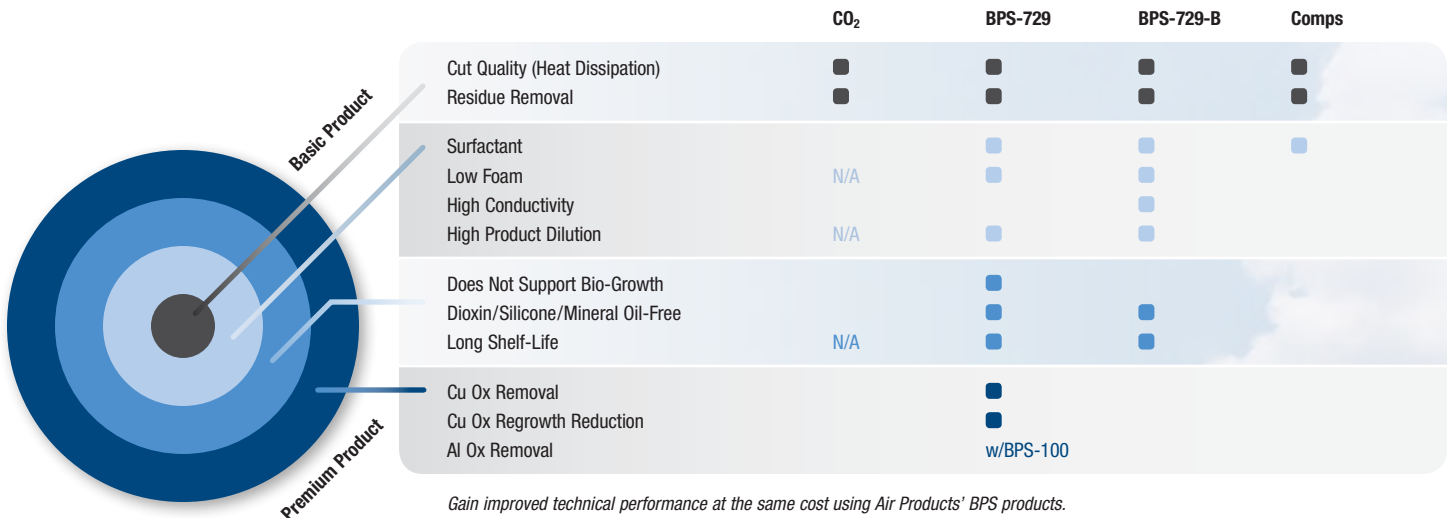
BPS-729 is our premium dicing solution that not only prevents adherence of silicon particles and saw residue (swarf), but also removes oxidation from bond pads or bumps and prevents their regrowth.

Due to its very low etch rate on various materials, BPS-729 does not affect base metals. It works through a combination of surfactant action and a unique micro under etch process that dislodges particles embedded in the surface without affecting the underlying substrate.

BPS-729 is specially engineered for ultra-low foam to prolong equipment life. BPS-729 is recommended for use between 200:1 and 1000:1 in DIW dilutions for most cleaning applications; ~100:1 for copper oxide removal; and ~100:1 for aluminum oxide removal in combination with a pre-treatment of BPS-100.

CONTACT: Raj Ramamurthi: ramamur@airproducts.com

The BPS Value Proposition for Dicing





Air Products Shows the Future of Solar Energy at SEMICON Taiwan 2009

The Asia Electronics team and Air Products San Fu, our subsidiary in Taiwan, participated in the SEMICON Taiwan 2009 (Sept. 30-Oct. 2) and showcased the company's extensive portfolio of electronics capabilities in each stage of device manufacturing under the global theme "Focused on What Matters Most."

As one of the largest electronics exhibitions in the region, the show drew more than 500 exhibitors and more than 18,000 visitors. Though the scale was smaller than last year reflecting the impact of the global economic downturn, visitors were enthusiastic and remained optimistic about the electronics market.

The emerging high-growth PV market was the focus of the Air Products Asia booth this year. Visitors were excited about our SunSource™ Solutions, the broad portfolio of products, services, and project management, as well as our leadership in the TFT-LCD solution that brings value to PV manufacturing operations to reach a faster ramp up and grid parity.

The XeCovary® Xenon Recovery System and the low-k solution also caught the attention of booth visitors. The XeCovary system provides a lower cost-of-ownership for using xenon in the manufacturing process, while the low-k solution gives a head start on integration, reducing development time, and lowering costs. Both addressed the great demand for cost- and time-efficient solutions for the semiconductor industry, especially during these challenging times.



Air Products Asia stressed its PV SunSource™ Solutions at SEMICON Taiwan.

SunSource™ Solutions Offering for Crystalline PV Manufacturing Drives Down Cost per Watt

For crystalline PV manufacturing, Air Products has developed an innovative SunSource™ Solutions offering for supplying POCl₃ (phosphorus oxychloride), which will help customers to reduce cost per watt.

POCl₃ is commonly used as an n-dopant in solar cell manufacturing. The molecule is very reactive and hygroscopic—exposure to moisture will generate phosphoric acid, so experience in safely handling this molecule is vital to your process.

We have more than 25 years of experience in supplying ultra-high purity POCl₃ to the solar and semiconductor industry. That includes a well-established fleet of bubblers—more than 50,000 currently in use worldwide. Air Products owns and manages this fleet, which allows us to maintain tight quality control over the product through an established worldwide supply chain covering Europe, Asia, North America, South America, and Australia.

Air Products' comprehensive POCl₃ Solution comprises molecules, bulk containers, related delivery equipment, and best-practice environmental, health, and safety. It is designed to help fabs increase tool productivity, reduce waste, lower the risk of contamination, and improve and maintain the safety and reliability of customer processes. Here's what we provide:

Variety of container offerings

Our POCl₃ offering relies on three different containers. Our 1500cc standard break seal bubbler comes equipped with Teflon valve connections, is PVC-coated for added safety and protection, and is UN/ DOT certified for shipping compliance.

The valves on our new purgeable bubbler offering allow for faster and easier purging during disconnect and reconnect. The purgeable bubbler is an exact drop-in fit for major OEM tools. Our VaporGuard® Temperature Control System is compatible with multiple temperature control systems and furnaces.

The new POCl₃ bulk container comes equipped with a proprietary lining, and is designed with no metal wetted surfaces, which ensures that there will be no contamination from corrosion, as well as better chemical utilization. Use of the bulk container reduces shipping and handling costs by over 90 percent.

State-of-the-art POCl₃ delivery

The recently introduced Air Products ChemGuard® CG1000 Chemical Delivery System is specifically for bulk POCl₃ delivery.

The CG1000 system enables high-volume delivery of the molecule to multiple tools. Its refill function eliminates tool downtime for bubbler changeouts, and it is the only system on the market that enables nearly 100% chemical usage and does not waste any POCl₃.

Key features of the CG1000 system are its integrated 10" color touch display, purge system to minimize risk of exposure, and 119 percent spill containment.

Lower cost-of-ownership

The Air Products POCl₃ solution for crystalline silicon PV manufacturing provides the lowest cost-of-ownership in the industry through four key advantages:

- 100 percent chemical usage.
- Reduced labor costs—the CG1000 cuts labor required to change containers by 93 percent.
- Increased tool uptime.
- Reduced liability costs and lower costs associated with developing on-site safety protocols.



The ChemGuard® CG1000 Chemical Delivery System delivers 100 percent POCl₃ usage.

TECHNICAL PAPERS:

The following technical papers were recently approved for publication and/or presentation:

Li, J., J. Wu, C. Z. Wu, B. Han, E. J. Karwacki, M. Xiao, X. Lei, and H. Cheng (2009).

“On the Dissociative Chemisorption of Tris(dimethylamino)silane on Hydroxylated $\text{SiO}_2(001)$ Surface.” *Journal of Physical Chemistry*, C 113(22): 9731-9736.

CONTACT: Barbara Schware: schwarba@airproducts.com

report from asia

(cont. from page 6)

“Despite the global economic downturn, trends show that the electronics market is gradually picking up. And, because Asia is a strategically important and growing market for Air Products, SEMICON Taiwan gave us an effective forum to show our electronics capabilities and discuss opportunities with our existing and prospective customers,” said John Tsai, president of Air Products San Fu.

CONTACT: Rebecca Tong: tongr@airproducts.com

Grace Semiconductor Honors China Electronics with Supplier Award

The GO (Global Operations) MEGASYS® team received recognition for providing excellent Total Gas Management services (MEGASYS) to Grace Semiconductor Manufacturing Corporation (GSMC) in Shanghai, China.

Francis Tsou, section manager of the GSMC facility, said in presenting the plaque to the MEGASYS team, “This award is in recognition of your professional support and cooperation to help us meet our goals in 2009.”

This is the fifth consecutive year that our MEGASYS team has received the performance award from GSMC.

Commenting on the award, Alex Lan, Asia Electronics operations manager, said, “This recognition could not be achieved without the hard



Grace Semiconductor recognized the GO MEGASYS® team for their professional support and co-operation.

work, safety/quality orientation, and attention-to-detail of all of our team members. This is under the direction, support and help from all levels of the management and departments of China Electronics. It is a true team effort and makes us all very proud.”

GSMC is one of China’s leading semiconductor foundries and one of China Electronics most important customers in the Shanghai region since it began fab operations in 2002. In addition to providing on-site MEGASYS services, we supply GSMC with electronics materials through our EM warehouse operations, EES equipment, and supply chain/customer service.

CONTACT: Jeff Bu: buj@airproducts.com

Air Products Korea Wins Supplier Appreciation Award from Samsung

Ok-Joon Kim, manager of Air Products plant in Giheung, Korea, received a “Supplier Appreciation Award” from Samsung on behalf of the company. The award recognizes Air Products for dedicated and professional support to the customer.

Samsung recently experienced some problems and upon their request, Air Products Korea responded promptly and sent technical experts to help Samsung resolve its issues by offering consultation on analyzer use and analysis results.

Samsung also recognized the constant cooperative support and reliable supply of gaseous nitrogen, NF_3 , silane, and hydrogen pipeline supply provided by Air Products Korea.

CONTACT: E.S. Yang: yanges@airproducts.com

TSMC Honors Taiwan MEGASYS® Team

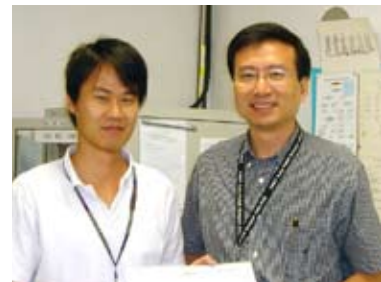
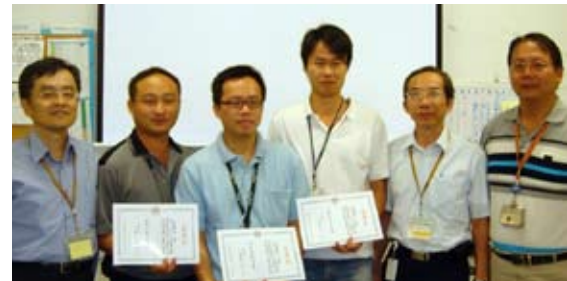
The Air Products Taiwan MEGASYS® team received a certificate of merit from Taiwan Semiconductor Manufacturing Company Limited (TSMC), one of our strategic electronics customers in Asia.

The team was recognized for the professional and prompt response to an emergency incident, as well as its focus on customers and safety.

“It is encouraging that customers have noticed and recognized our professional work attitude and outstanding performance. More importantly, we have proved that the value of ‘customer focus’ is rooted in our daily work,” said Alex Lan, Asia Electronics operations manager.

CONTACT: Kevin Chen: chenkc1@airproducts.com

Pictured from left: (from Air Products San Fu) are James Lee, TSMC focus account manager; George Chang, MEGASYS deputy engineer; Kuen Yi Wu, MEGASYS assistant engineer; Hsiao Yi Liang, MEGASYS assistant engineer; Steve Lin, general manager, Southern Taiwan; and from TSMC, Robert Huang, TSMC-6 principal engineer.



Pictured from left: Hsiao Yi Liang, MEGASYS assistant engineer of Air Products San Fu, received a certificate of merit from Vento Yu, TSMC Fab-6 Gas and Chemical section manager.

winter 2010

tell me more
www.airproducts.com/electronics

company information

Air Products serves customers in industrial, energy, technology and health-care markets worldwide with a unique portfolio of atmospheric gases, process and specialty gases, performance materials, and equipment and services. The company has annual revenues of \$9 billion, operations in over 40 countries, and over 20,000 employees around the globe.

Electronics Update is published for the global electronics industry customers of Air Products and Chemicals, Inc. For more information, please call 610-481-2601 or Email us at mckendej@airproducts.com.

Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, Pennsylvania, U.S.A. 18195-1501
Tel 610-481-4911
www.airproducts.com/electronics

Air Products PLC, Electronics Group
Hersham Place; Molesey Road
Walton-on-Thames, Surrey, England KT12 4RZ
Tel 44-0-1932-249959, Fax 44-0-1932-258063
Email euroelec@airproducts.com

Air Products Asia, Inc. (Jessica Cheng)
Suite 6504-7 Central Plaza
18 Harbour Road
Wanchai, Hong Kong
Tel 852-25271922

325-09-081-GLB

electronicsupdate

Air Products and Chemicals, Inc.
Attention: Ed McKendry
7201 Hamilton Boulevard
Allentown, Pennsylvania, U.S.A. 18195-1501

AIR PRODUCTS