

A Breath of Fresh Air

INDOCHEM DISCOVERS THE BEST WAY TO OPTIMIZE PRODUCTION RATES AND AIR CONSUMPTION IN SOLVENT MANUFACTURING IS BY USING THE INNOVATIVE PRO-FLO® SHIFT AODD PUMP FROM WILDEN®



Over its 30-plus years of operation, PT. Indochemical Citra Kimia, better known as "IndoChem," has grown into a recognized leader in solvent, glue and ink production for use in a number of industrial markets in Southeast Asia.

Founded in 1997, the Asia Pacific Petrochemical Co., Ltd., which is headquartered in Bangkok, Thailand, has rapidly grown into one of the leading importers, exporters and distributors of hydrocarbons, oxygenated solvents and monomers for use in industrial-manufacturing operations in the Asia-Pacific region. Helping Asia Pacific Petrochemical reach its lofty status has been a group of subsidiary companies that are strategically located in an area that includes the Southeast Asian island nations of Indonesia, Singapore, the Philippines and Malaysia.

Representing the group in Indonesia is PT. Indochemical Citra Kimia, widely known as "IndoChem." Based in Jakarta, Indonesia, IndoChem was founded in 1982 and is a recognized leader in solvent production for use in the Indonesian paint and coatings market, and also a significant producer of glues and inks for various industrial applications.

IndoChem's solvent-manufacturing business consists of three plants located in Indonesia. These plants have holding

tanks that can accommodate up to 45,000 liters (11,888 gallons), and are constantly being filled and emptied depending on the facility's manufacturing and delivery needs. In all, IndoChem produces and handles a total of 300

QUICK FACTS

Company: PT. Indochemical Citra Kimia

Location: Jakarta, Indonesia

Market: Solvent Manufacturing

Distributor: Winston Engineering Indonesia, Jakarta, Indonesia

Challenge: IndoChem needed to optimize the loading times, energy efficiency and product containment of its solvent-handling pumps

Solution: Pro-Flo® SHIFT AODD Pumps deliver enhanced loading times with leak-free operation and optimized air consumption

million liters (79.3 million gallons) of solvents per year at its three production facilities.

Growing Pains

As IndoChem's customer base has increased, several operational challenges have begun to hamper its ability to reliably and efficiently meet its production quotas:

- The time needed to fill one 45,000-liter holding tank has approached seven hours, which is unacceptable for IndoChem's clients
- The capacity of IndoChem's air-compressor unit has been maxed out and it is not possible to add another compressor from both an economic and available-space standpoint
- Perhaps most importantly, the solvents produced by IndoChem are highly flammable, and some of them self-spark, so it is important from a safety standpoint that they are contained adequately

"Our current transfer time is approximately three hours for transferring input and three hours for transferring output, plus 30 minutes for mixing and 30 minutes for preparation," said Erwin Juardi, General Manager of Operations for IndoChem. "Since we're planning on some improvements, we wanted to add more pumps, but we want to stay with the same air-compressor capacity. I'd love to see whether it's possible that I can save air even though I'm adding pumps and getting more pumping capacity."

To facilitate the transfer of solvents, Juardi utilizes a total of 60 pumps between his three manufacturing facilities. He had been strictly relying on a single brand of AODD pump, but over time he had come to find the pumps unreliable



Installing the revolutionary Pro-Flo® SHIFT ADS on a Wilden® Bolted Series AODD Pump gave IndoChem the flow rates, air consumption and product-containment capabilities that it requires in its solvent-handling operations.



An on-site, head-to-head test at the IndoChem facility unequivocally illustrated that a Wilden® Bolted Series AODD Pump outfitted with the Pro-Flo® SHIFT ADS shortened loading times while cutting air consumption (competitor pump shown).

and costly to operate.

"They have a high cost of replacement parts, and I have a hard time getting diaphragms; I'm fed up with these pumps," he said flatly. "The diaphragms don't hold up and it's hard to work on them. It takes two guys to simply change a diaphragm and I don't want manpower wasted on pump maintenance. We needed a simpler, more reliable, higher-performing alternative."

In the search for a better solution, Juardi turned to Winston Engineering Indonesia, Jakarta, Indonesia. Since 2005, Winston Engineering Jakarta, which is an operating company within Singapore-based Winston Engineering Company (PTE) Ltd., has been a pump distributor specializing in pump technology designed for use in general industrial-pumping applications, including the handling of solvents, glues and inks.

Seeing Is Believing

Juardi worked with Peter Koh, Regional Product Manager for Winston Engineering, who was quick to suggest the new Pro-Flo® SHIFT AODD Pump from Wilden®, Grand Terrace, CA, USA. Company founder Jim Wilden invented AODD pump technology in 1955. The Pro-Flo SHIFT is an AODD pump air distribution system (ADS) that can deliver as much as 60% savings in air consumption when compared to other brands (see Sidebar).

"Winston Engineering has a long relationship with Wilden and PSG, and we have been selling their products for more than 20 years," said Koh. "With the latest Pro-Flo SHIFT technology it is bringing Wilden to the next level. This

pump really, really has an edge when it comes to energy savings.”

But rather than simply have Juardi take his word for it, Koh arranged to have an on-site test and demonstration of the Pro-Flo SHIFT technology done at one of IndoChem’s facilities. The test involved three separate trials in which both a Wilden Pro-Flo SHIFT pump—specifically, a 51-mm (2-inch) PS800 Bolted Series aluminum AODD pump—and a competitive model would pump 200 liters (52.8 gallons) of water, with all pumping done at a pressure of 4 bar (58 psi). Measured would be the time it took to pump the water along with the amount of air that would be required to complete the pumping process.

Extrapolating the results for one of IndoChem’s standard 45,000-liter tanks, the test results showed that the Wilden pump would be able to fill the larger tank in 78 minutes less than the competitive model, while needing 2,164.08 fewer standard cubic feet per minute (SCFM) to complete the transfer process.

Juardi was easily convinced.

“I know that Wilden pumps are very reliable,” said Juardi. “We’ve had one here for more than 20 years and we haven’t found any problems with it. So, I’m thinking, let’s change the old pumps to Wilden. What we’re learning from the old Wilden pump is that it has been here forever, but with no problems. I was also looking for air savings because I cannot



Erwin Juardi, General Manager of Operations for IndoChem, is convinced he has found the solution to his solvent-handling needs with the Wilden® Pro-Flo® SHIFT AODD Pump.



The sheer volume of solvents that IndoChem handles annually made the need for a more efficient pump a critical consideration.

Optimizing Air Consumption In AODD Pumps

Throughout its history, air-operated double-diaphragm (AODD) pump manufacturers have been working to find a reliable solution to the technology’s one blind spot: the “overfilling” of the air chamber during the period from the end of each stroke to the completed shift of the valve without any corresponding displacement of fluid, which is nothing more than wasted air that is vented to the atmosphere.

To combat this overfilling, Wilden® Pump & Engineering Co., Grand Terrace, CA, USA, has long been an innovator in air distribution system (ADS) development,

and while its Turbo-Flo™, Pro-Flo™ and Pro-Flo SHIFT™ ADS models undeniably advanced the capabilities of the technology, the industry was still waiting for that ultimate “Eureka!” moment in ADS development.

That moment arrived in 2013 when Wilden completed the development of the Pro-Flo® SHIFT ADS. Described as a “true game-changer” and “significant breakthrough in energy efficiency” in AODD-pump operation, the mechanically actuated Pro-Flo SHIFT ADS restricts air flow into the air chamber near the end of each pump stroke through the incorporation of an air control spool that automatically meters the air to prevent overfilling with no corresponding reduction in product yield.

This means that an AODD pump outfitted with the Pro-Flo SHIFT ADS—which is available on Wilden’s Original™ (clamped) and Advanced™ (bolted) Series AODD Pumps—can achieve up to 60% savings in air consumption while costing 50% less to operate than pumps that feature an electronically actuated ADS. An additional benefit is that the Pro-Flo SHIFT is mechanically actuated, which is a critical consideration when the pump is handling hazardous or flammable liquids. Electronically actuated ADSs, on the other hand, cannot be used with flammable or explosive liquids since the electric charge can cause sparking which could ignite the liquid and result in a deadly explosion.

“Having this Pro-Flo SHIFT pump means I can save air and won’t need to add compressors, which means less electricity use, and that I can also increase my productivity,” said Edwin Juardi, General Manager of



afford to buy any more air compressors.”

In addition to the air-consumption improvements that the Pro-Flo SHIFT ADS can provide to the Advanced Series AODD Pumps, there are a number of operational benefits that IndoChem will be able to take advantage of. The bolted configuration of the pumps ensures total product containment, a key consideration with the hazardous materials that IndoChem creates and handles. Additionally, the Advanced pumps have a redesigned friction-reducing liquid path that contributes greatly to their ability to deliver maximized flow rates. In fact, the PS800 (51 mm) pump can achieve flow rates as high as 704 L/min (186 gpm), while the larger PS1500 (76 mm) model has flows to 1,045 L/min (276 gpm).

A variety of elastomer options, including PTFE, Wil-Flex® (Santoprene) and Neoprene, are available to meet abrasion, temperature and chemical-compatibility concerns. Wilden’s newest diaphragm option is the innovative Chem-Fuse Integral Piston Diaphragm (IPD). The design of the Chem-Fuse locates the piston within the diaphragm material, which eliminates a notorious leak point and further helps to guarantee leak-free product containment.

Conclusion

Too often, the easy suggestion when a manufacturing facility has reached the limits of its operational capacity is this one: Find a bigger facility. In the case of IndoChem, though, that was not a feasible solution. So, that meant the solvent manufacturer needed to find a way to optimize its productivity in terms of time, air consumption and energy usage while operating from the same footprint.

IndoChem found the answer in the new Bolted Series Pro-Flo SHIFT AODD Pump from Wilden, which will enable it to simultaneously improve both its fluid-transfer times and energy savings while working out of the same facility with the same air compressor.

“The unique features of Wilden pumps are very easy for maintenance, portable and with a very unique high-efficiency ADS, which is the heart of the pump,” said Koh. “Every part is replaceable, even for pumps that have been in the factory for more than 10 years. That’s part of why customers stay with the Wilden brand. Wilden is the unique market leader in diaphragm pumps.”

Knowing that a Wilden® Pro-Flo® SHIFT AODD Pump will fill a 45,000-liter tank in 78 less minutes and while consuming 2,164 fewer standard cubic feet per minute of compressed air than a competitive model has put a collective smile on the faces of the IndoChem engineering team. Pictured from left to right: Rob Cheng and Peter Koh of Winston Engineering. Bottom: Erwin Juardi of IndoChem.



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