

Solutions To Leakage Problems In Polyester Resin Industry

BLACKMER® NP SERIES SLIDING VANE PUMPS EQUIPPED WITH FLUIDOL® LIP-SEAL TECHNOLOGY
HAVE COMPLETELY ERADICATED LEAKAGE CONCERNS IN ALIANCYS' NANJING MANUFACTURING FACILITY

By Ricky Li



Aliancys is a leading global company active in the sales of quality resins for composite applications. Together with its customers, Aliancys is pushing the limits of both composite part manufacturing and performance.

“Green” production is a critical buzzword in the Made in China 2025 manufacturing program, which was unveiled by the State Council in 2015. The concept of “green,” or environmentally sensitive, production penetrates the whole plan and is the Chinese government’s authoritative definition of what it terms an “intelligent manufacturing” strategy.

Companies all over the world have reached a consensus on green production. For the chemical industry, the benefits created by green production not only reduce environmental pollution, but also effectively guarantee specific output quotas and control operating costs.

Yao Ke is after the Technical Manager for Jinling Aliancys Resins Co., Ltd. in Najing, China, and he has a deep understanding of this issue. As such, he is responsible for ensuring that all operations at the company’s Nanjing manufacturing facility meet strict regulations regarding project maintenance and operation of the factory.

QUICK FACTS

Company: Jinling Aliancys Resins Co., Ltd.

Location: Nanjing, China

Market: Resin Production

Distributor: Winston Engineering Corp., Ltd., Shanghai, China

Challenge: Identify and employ a pump technology that would not leak during the production of industrial resins

Solution: Blackmer® NP Series Sliding Vane Pumps with Fluidol® Lip Seals

A Bump In The Production Road

Jinling Aliancys Resins Co., Ltd. manufactures and processes unsaturated polyester resins. According to data provided by Yao Ke, Aliancys’ products are used in diverse fields, ranging from real estate, tube construction, water craft, high-speed rail, and so on.



However, as a high-quality resins provider, Aliancys began encountering an intractable problem during the process of resin production. Basically, the problem centered on the performance of the gear pumps that were being used to transfer the resins. During the various resin-transfer operations, the gear pumps would inevitably leak, which would lead to lost product, the need for costly cleanup time and creation of potential safety issues. For a resin manufacturer, leakage at any point in the production chain is a major technical problem.

As a solutions expert in resin production, Aliancys had built a reputation in optimizing the production process, but the leakage problems forced the company to search for and identify an external solution to the problems it was facing.

The Bane Of Resin Manufacturing

Roy Yang is the Regional Sales Manager of Winston Engineering Corp., Ltd., Shanghai, China, which has been a longtime channel partner with Aliancys. Winston Engineering is a leading distributor of Blackmer® Sliding Vane Pumps in China. Founded in 1903, Blackmer, Grand Rapids, MI, USA, is a product brand of PSG®, a Dover company, Oakbrook Terrace, IL, USA., and a manufacturer of positive-displacement pump and compressor technologies for gas-liquid product transport. Pumps manufactured by Blackmer are frequently used in the fields of LPG, chemical, refined fuels, petroleum, military, marine exploration and transportation.

In 2012, when Aliancys set up its factory in the Nanjing Chemical Industry Park in Jiangsu Province, China, as a specialized manufacture of polyunsaturated polyester resin, it chose to use gear pumps for product transfer. However, as mentioned, serious leakage problems began to occur shortly after the new facility began operations.



The shortcomings of gear pumps were very serious during production, as leakage would occur every one to two months.

“In the process of unsaturated polyester resin manufacturing, we can hardly do without the pumps for transfer, transportation, supercharging and metering,” said Yao Ke. “In the beginning, we used the gear pumps to complete the tasks, but three or four months later problems were revealed.”

Specifically, the problems caused by leakage in the gear pumps included:

● Gear Pumps Are Susceptible To Wear And Tear

“The wear of the gear pump is far worse than we could imagine,” said Yao Ke. “In other words, the leakage would happen every one or two months and we’d have to install a brand-new set of lip seals every three or four months!”

● No Guarantee Of Hygienic Operation

“Hygienic operation in the factory could not be guaranteed because of the leakage of water and oil,” said Yao Ke. “Capitalize in general, if resin leakage occurs in the pipeline, toxic gases like styrene may be released, which creates a safety risk for site personnel and technicians.”

● High Maintenance Cost

Every time serious pump leakage would occur or pump maintenance would be required, production would be halted, which would affect production schedules. Even if the production was able to continue, the leakage would hinder the production process.

Faced with these untenable problems, Yao Ke turned to Yang for a solution and he immediately suggested that Aliancys replace the problematic gear pumps with Blackmer NP Series Sliding Vane Pumps. After educating themselves on the benefits that sliding vane pumps could offer their operation, Yao Ke and the Aliancys factory managers accepted the proposal and changed out two of the ill-performing gear pumps with Blackmer vane pumps.

The NP Series pumps hit the sweet spot in Aliancys’ resin-handling operations because they feature a metallized carbon sleeve bearing that delivers continuous-duty operation and zero maintenance because it features no greased or lubricated bearings, which can be difficult to maintain. Also, the NP’s non-metallic vanes offer dry-run, self-priming and line-stripping capabilities, while the gear pumps featured metal-to-metal contact that prevents dry-run operation.

A Solution For Zero Leakage

According to Yang, what made the Blackmer sliding vane pumps an ideal replacement for the gear pumps was their use of Fluidol® triple lip seals, which helps turn leakage problems into history. Fluidol is a Columbus, OH, USA-based company that specializes in the manufacture of

rotary seals for use in industrial, military and aerospace fluid-sealing applications.

The triple-seal design of Fluidol's lip seals make them ideal for resin-handling applications because resins are generally too thick for single-type end-face mechanical seals, while double seals that require pressurized seal pots are too expensive and too complicated to operate. The Fluidol seals are also dry-run capable, while a solid, highly polished silicon carbide sleeve creates a reliable and consistent sealing surface, even when used with crystalizing liquids. The seal's carbon-modified TFM lip material is rated for use in temperatures in excess of 200°C (392°F) and with liquid viscosities from 0.5 to 25,000 cSt.

After some installation tests, the Blackmer NP Series vane pumps reached Aliancys' required level of seal performance. After their installation, Yao Ke has kept detailed records of the performance of the Blackmer vane pumps and listed the following advantages that have been created by their performance:

- **Durable Zero Leakage**

Compared with the leakage that would occur every two months with the gear pumps, there has been no leakage at all after one year of using one of the Blackmer pumps and three months with the second pump. "The Blackmer

pumps have reached a high level of performance that the gear pumps could hardly match," said Yao Ke. "We are very satisfied with this result."

- **Load Balance Reduces Wear And Tear**

The outstanding bearing-support system in the Blackmer pumps ensures even load balance and low abrasion. The gear pumps were prone to abrasion wear that would create the need for maintenance, which added to the factory's maintenance bill.

- **Adjustable And Easy-To-Maintain Safety Valve**

The adjustable safety valve on the Blackmer pumps makes them easy to maintain. "In the past, we had to suspend production to maintain and replace the gear pumps," said Yao Ke. "With the Blackmer pumps, we don't have to, which is extremely important for Aliancys since we don't want to halt the production line and have to guarantee a specific rate of resin output."

The excellent performance of Blackmer NP Series pumps has thrilled Yao Ke and the other Aliancys managers, and has enabled the factory to reach all of its production goals for a full year. As a result, Aliancys has decided to replace the remaining gear pumps with Blackmer NP pumps.



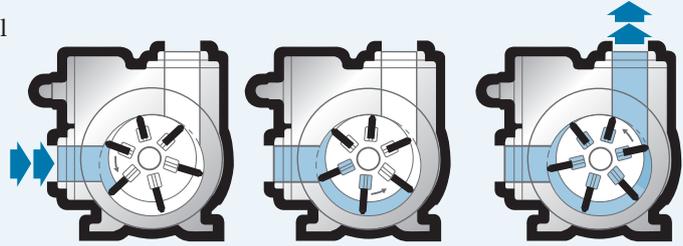
Yao Ke is the Technical Manager of Jinling Aliancys Resins Co., Ltd., and his job has been made easier with the incorporation of Blackmer® NP Series Sliding Vane Pumps into the resin-production process. "The outstanding performance and zero leakage of the Blackmer sliding vane pumps has exceeded our expectations, and based on our successful experience of using the Blackmer pumps, we will recommend this technology to our affiliates around the world," he said.



Blackmer Technology — The Principle of Sliding Vane Pumps

Blackmer sliding vane pumps have a number of vanes that are free to slide into or out of slots in the pump rotor. When the pump driver turns the rotor, centrifugal force, rods, and/or pressurized fluid causes the vanes to move outward in their slots and bear against the inner bore of the pump casing forming pumping chambers. As the rotor revolves, fluid flows into the area between the vanes (pumping chambers) when they pass the suction port.

This fluid is transported around the pump casing until the discharge port is reached. At this point the fluid is squeezed out into the discharge piping. Each revolution displaces a constant volume of fluid. Variances in pressure have minimal effect. Energy-wasting turbulence and slippage are minimized and high volumetric efficiency and low energy consumption are maintained.



Conclusion

After the introduction of the Blackmer NP Series Sliding Vane Pumps, the whole factory has taken on a new look. The previous equipment that caused leakage can no longer be found in the factory and, therefore, the tidiness and orderliness of the resin-production operation has been optimized. The Blackmer pumps have turned Aliancys' dream of upgrading its resin-production operations into reality while simultaneously promoting green operations that improve efficiency and safety.

"Based on our own successful experience, we will recommend Blackmer pumps to the full spectrum of Aliancys manufacturing facilities in China, Europe and all over the world," said Yao Ke. "We feel that the performance of the Blackmer pumps can make them a critical best-practices choice in any resin-handling application."

About The Author:

Ricky Li is a Product Manager for PSG® and can be reached at ricky.li@psgdover.com. Blackmer®, Grand Rapids, MI, USA, is a product brand of PSG®, a Dover company, Oakbrook Terrace, IL, USA, which is comprised of several leading pump companies, including Abaque™, Almatec®, Blackmer®, Ebsray®, EnviroGear®, Griswold™, Mouvex®, Neptune™, Quattroflow™, RedScrew® and Wilden®. You can find more information on Blackmer at blackmer.com and PSG at cn.psgdover.com.

Blackmer
www.blackmer.com

World Headquarters

1809 Century Avenue SW
Grand Rapids, MI 49503-1530 USA
T: 616.241.1611 F: 616.241.3752

PSG
a DOVER company

PSG

Address: Room 1802, Building A, IBC,
391 Guiping Road, Xuhui District,
Shanghai, 200233, P.R. China

P.C: 200233

Tel: 86 21 8021 2000

Fax: 86 21 6495 6018