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Sustained Commitment: Supply, Innovation, Technology, and Quality

- An interview with Kurt Aerts, Vice President, Global Specialty Elastomers and Butyl, ExxonMobil.

ExxonMobil Shanghai Technology Center 埃克森美孚上海研发中心

Following its rapid development over the past 10-20 years, the Chinese automotive manufacturing industry has a brand new look. It is now going down a path of improved quality and sustainable development. On one hand, consumer requirements are constantly growing, driving automotive enterprises to adopt materials with better performance and higher quality that improve the driving and riding experience. On the other hand, growing stringent fuel economy standards and emissions regulations have prompted these enterprises to take a variety of effective measures to increase fuel efficiency and reduce emissions. All of these factors provide a broader realm of utilization for advanced high-tech materials. ExxonMobil has responded rapidly to these trends. ExxonMobil's Vice President of its Specialty Elastomers and Butyl, Kurt Aerts, uses the phrase "sustained commitment" to express the company's sincerity in serving the Chinese automotive market stressing that "secure and reliable supply" is critical.

Reporter: Sun Jie

ExxonMobil made a large investment to build the world-class Research & Development center in Shanghai. The R&D center is equipped with world-class advanced testing facilities and trial production equipment. ExxonMobil also brings in experts from overseas to support local business as well as train local employees, providing technical-support service to customers in China and other Asia Pacific areas.



ExxonMobil's Specialty Elastomers and Butyl Business primarily provides three types of materials to the automotive industry: Santoprene™ thermoplastic vulcanizate (TPV), Vistalon™ ethylene propylene diene monomer (EPDM) rubber, and Exxon™ butyl rubber. For decades, these three products have been able to rely on their outstanding performance to achieve long-term and stable growth in the global market.

Offering excellent processability, durability, and sealing performance, Santoprene™ TPV provides low-cost, high-efficiency, and lightweight solutions for window seals, steering shaft jackets, engine air conduits, corner injection moldings, and other car parts.

Vistalon™ EPDM, with its superior sealing performance and UV, chemical and high-temperature resistance, provides long-term and reliable seals and sound dampening effects for car door seals. It also offers perfect solutions for transmission belts and hoses used under the car hood.

Exxon™ butyl rubber – specifically halobutyl – is mainly used as the inner liner for tires. Its outstanding air retention capability plays a critical role in reducing rolling resistance and increasing fuel economy.

According to Kurt Aerts, "For every three cars manufactured around the world, one is made in China. This gives you an idea of the size of the Chinese automotive market. Moreover, market scale is only one perspective. If we look at development trends, the Chinese automotive manufacturing industry is constantly working to improve quality and intensify sustainable development processes. This gives us unlimited opportunities to make use of our intrinsic strengths. Without a doubt, China is our very important growth market. In dealing

with this important market, we emphasize the use of our global knowledge and expertise, combined with our localized response to help customers solve their problems and ensure that they get the most value. We consistently adhere to these principles when providing product solutions. Based on these features of the Chinese automotive market, we believe that 'Secure and reliable supply' is of critical importance. As the inventor of these three major products, we inherently possess unique advantages, in addition to many years of sustained innovation and investment in production capacity and local resources. As a result, we have a completely unique position in the market, allowing us to effectively meet our customers' needs. Meanwhile, we also emphasize that issues must be viewed and addressed with developmental viewpoint. As market demands change, we need the corresponding decision-making ability and flexibility to respond to these changes. This is what we call 'sustained commitment!'"

According to Aerts' description, "sustained commitment" mainly covers the following four aspects.

Secure and Stable Supply

Firstly, butyl rubber is a typical example that illustrates supply security and stability. Although halobutyl is used in small quantities in each tire, it is indispensable for the inner liner. This material determines the air retention performance of the tire and plays a critical role in ensuring safety, reducing rolling resistance, and improving fuel economy. Furthermore, due to the fact that it is quite difficult to produce and there are few production facilities in the world that can provide this material, supply shortages can easily occur. It is no wonder that for tire manufacturers, this is a significant concern.



In the picture, Kurt Aerts discusses technology with employees at the Shanghai Technology Center. ExxonMobil's well-trained local teams are capable of providing customers with highly-efficient application technology support service.

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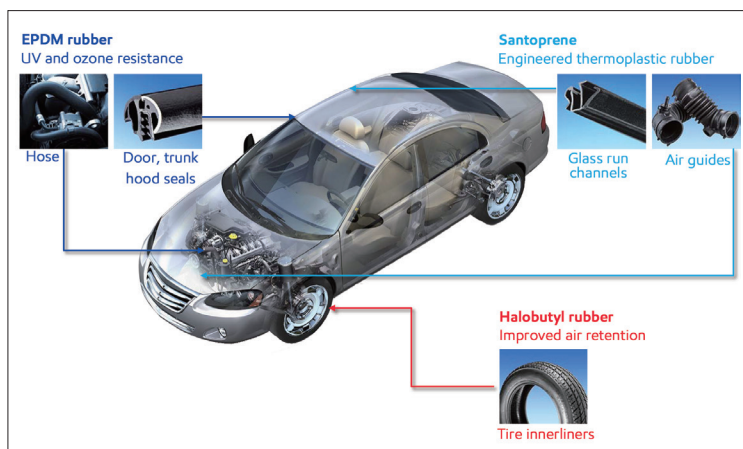
Over the past two years, ExxonMobil has invested in a series of initiatives, providing peace of mind to tire manufacturers. In late 2016, the company's 35-year joint-venture plant in Saudi Arabia opened a new Exxon™ butyl rubber (halobutyl) production line. ExxonMobil has 100% marketing rights to the products manufactured on this line. At the same time, another project was launched in which ExxonMobil has 50 % rights to the production capacity of Vistalon™ EPDM and two other materials. In addition, at the company's largest global petrochemical production plant in Singapore, ExxonMobil has invested in a new global-scale halobutyl production line that is currently under construction. Once it is completed, it will be fully integrated with the company's existing production facilities in Singapore.

Aerts said that with the growth of the Chinese middle-class, growing levels of urbanization, and increasing sustainable development in the future, he predicts that demand for ExxonMobil high-performance chemical materials will continue to grow. Therefore, in addition to Exxon™ butyl rubber and Vistalon™ EPDM, the company is working to expand its production facilities in Newport, Wales, increasing Santoprene™ TPV production capacity by 25%. This project is scheduled to be completed by the end of 2017.

Stable Supply and Quality

As an industry-leading chemical company, ExxonMobil currently has 12 world-class rubber production facilities worldwide, including six for butyl rubber products, four for Vistalon™ EPDM, and two for Santoprene™ TPV. With the completion of the new projects mentioned above, ExxonMobil's global supply chain network will be further strengthened. The newly established production capacity will help to ensure that the needs of developing markets in China, India, Eastern Europe, and the Middle East can be fulfilled. This will further solidify the company's leading position in the global market.

However, the guarantee of sufficient production capacity is only one aspect. As a global company with a long history, ExxonMobil's reputation for providing products with



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Kurt Aerts, uses the phrase "sustained commitment" to express the company's sincerity in serving the Chinese automotive market, stressing that "secure and reliable supply" is critical.

excellent and consistent quality is the key to its success in earning the respect of customers worldwide.

Aerts said that stable and reliable product quality is also of great importance to Chinese customers. This is the key to increasing the quality of their final products and reducing the defective product rate, thereby maximizing revenue. Especially as customer's production processes become increasingly automated, their need for materials of consistent quality will become more pronounced. As it continues to improve its globally integrated production quality control system, ExxonMobil is able to ensure it provides products with a consistently high quality, no matter where they are produced or the batch.

Strong Technical Support

Six years ago, ExxonMobil made a large investment to build the world-class Research & Development center in Shanghai. Providing convenience to customers, its primary functions are to provide technical support services for product applications, materials verification, product design, and trial production services in the early phase of product development. In the meantime, the center provides consulting services and guidance for customers during product development, standards formulation, and application optimization. To achieve this goal, the R&D center is equipped with world-class advanced testing facilities and trial production equipment. ExxonMobil also brings foreign experts to STC to support local business as well as train local employees.

"Through our continued investment in the Shanghai R&D center, we ensure that we can rapidly respond to customers and provide them with highly-efficient technology support and services. Chinese tire manufacturers or local automotive industry customers no longer have to be concerned about insufficient application experience. Our well-trained local teams are capable of helping customers realize successful material applications or substitutes," said Aerts.

Over the past few years, ExxonMobil's local teams have accomplished outstanding work. Through the cooperation and support of these teams, some local Chinese enterprises have established their own comprehensive application standards and successfully applied ExxonMobil's materials in new mass-produced automotive models. They have achieved vehicle weight reduction, improved performance, and lower fuel consumption and emissions. Moreover, ExxonMobil's comprehensive application experience has also helped local enterprises shorten their development process and avoid delays.

According to Aerts, this extensive application experience can also be applied to new energy vehicles. By optimizing material usage, manufacturers can build lighter vehicles with better performance and reduced rolling resistance, thereby extending the battery-life and mileage of new energy cars.

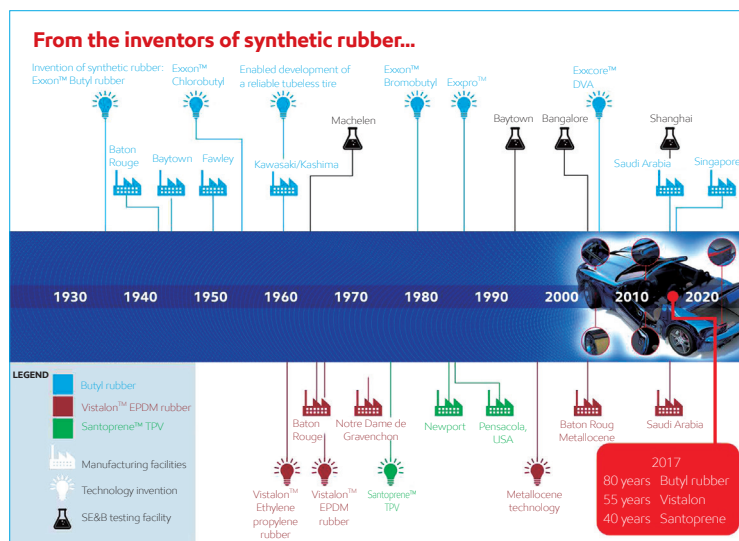
Guarantee of Sustained Innovation

Looking into the future, Aerts said that, with the continued growth of customer demand, their increasingly demanding requirements, and the need to adapt to the sustainable development of the automotive industry, "sustained commitment" is more important than ever. To put this principle into action, the company must continuously innovate to develop materials with better performance and enhance its accumulation of application knowledge, while cultivating world-class employee teams.

"Customers' needs are constantly changing, and changing ever more rapidly. This means that we must listen to our customers at all times and, through sustained innovation,



Kurt Aerts stands in front of history wall at ExxonMobil Shanghai Technology Center.



Over the years, ExxonMobil has shown industry commitment through continual product development and expansion in both worldwide technology centers and rubber manufacturing plants.

ensure that we can consistently and properly address their needs." Aerts continued, "One thing we are proud of is that ExxonMobil has a long history of innovation. In the past, we have invested tremendous effort in R&D, and we will continue to invest in the future, laying a sound foundation for our sustained innovation."

ExxonMobil, known as the 'father of synthetic rubber', invented synthetic butyl rubber 80 years ago due to the dilemma of the natural rubber supply shortage, turning a new chapter in the global automotive manufacturing industry. Even today, this significant invention continues to drive the sustainable development of the automotive manufacturing industry through constant innovation. Likewise, ExxonMobil's invention of ethylene propylene diene monomer (EPDM) 55 years ago and thermoplastic vulcanizate (TPV) 40 years ago made an indelible contribution to boosting the progress of automotive manufacturing technology.

"Looking towards the future, with the continued advancement of sustainable development in the automotive industry, we are committed to using sustained innovation to further develop the potential of these three materials in improving fuel efficiency and reducing emissions, so that their strengths can be utilized to the maximum extent possible," said Aerts. "Taking butyl rubber as an example, ExxonMobil is currently developing several new projects, relying on its numerous patented technologies and magnificent R&D capabilities. With the success of new project development, the air retention performance of Exxon's halobutyl will be improved to even higher levels. "

Obviously, in serving the Chinese automotive industry, ExxonMobil has four core competitive advantages — supply, innovation, technology and quality — which represent the basis of the company's "sustained commitment". In other words, through continued innovation and investment, the company will meet its customers' needs rapidly and with high quality. Along with its customers, ExxonMobil will promote and contribute to the sustainable development process of the Chinese automotive industry. **A1**