

Established in 1998, Boteli Valve Group is celebrating its twentieth anniversary. Valve World visited the Boteli headquarters in Yongjia county, Wenzhou - also known in China as the Land of pumps and valves - to meet the founder and president, Mr. Huang Shengfeng and find out how his company has established such a sound reputation in the competitive global valve market.

By Laura Wang



The 'Boteli-family': the company has enjoyed rapid growth in the past and focuses now on controlled expansion. (photo credits: Boteli)

Boteli: well prepared for another two decades

Towards the end of 1998, Boteli entered the valve market with its API 602 forged steel valve products. As mentioned by Mr. Huang, Boteli hardly had a market share at the time. After completion and commissioning in 1999, the company's turnover was close to 20 million RMB (2,5 million euro in today's currency, ed.). However, back in 1998 there weren't many API 602 producers in China. Boteli made a perfect choice in the timing and market segment when the company entered the valve market. It registered the "BTL" trade mark in 2000; in 2001, the company upgraded to "Boteli Valve Co., Ltd.", entered the PetroChina-market and SinoChem-market as Grade A Supplier under frame contract. In 2004, Boteli officially entered the international market by establishing its first overseas subsidiary

in Brazil, and in 2006 the company received the title of "Top 500 Corporations In Machinery Manufacturing Industry".

Controlled growth

Boteli's turnover soared from 20 million in 1998 to 350 million RMB in 2006, with a growth rate of nearly 18 times. Therefore, Mr. Huang labels the first eight years as the "rapid growth period". After this period, Boteli entered the "adjusting and development period" with a focus on controlled growth rather than "irrational expansion". Each year, from 2007 to 2010, Boteli was awarded the title of "Wenzhou Municipality Top 100 Corporations", "Yongjia County Company of Merit" and "Major taxpayer". Meanwhile, the group improved its organizational structure and implemented a diversified investment plan. This strategy yielded

a progressive 10% annual growth rate, even with the impact of the 2008 global financial crisis.

Push the brand globally

While enjoying steady and fruitful growth, Boteli still identified some problems in its corporate management. By means of continuous adjustment regarding its strategy, the company initiated the third development stage: "transformation and surpassing period".

By 2015, Boteli had registered 30 patents with proprietary intellectual property rights. One of its technical renovation projects has been approved as "Centrally funded technical renovation project of medium and small size enterprise" and another project has been included in the National Torch Program (national program aimed at high-tech companies and start-ups, ed.). Besides retaining the domestic market, Boteli is also keen to uphold the operational philosophy to "Push the national brand to the global market" and has taken a share in the valve markets in many major regions

and countries, such as USA, Germany, Middle East, Russia, India, etc.

The fourth stage

Boteli set up a new plant close to the original one, which started manufacturing in June 2016. The floor area of the new plant is about 80,000m², but the large scale is not the only surprising factor. It has adopted a complete set of smart production systems. All the drawings, goods and machinery are linked up. The new plant also implements a MES system, enabling the assembly and inspection works to be organized in such a manner that they flow along the production line. The ultimate goal is to realize the unified and comprehensive deployment of the processing center.

Mr. Huang explains: "Firstly, land is scarce in Wenzhou. Our new plant created much space for our future development; secondly, manpower is becoming more and more limited because many young people prefer to work in inner cities, a development that is being supported via national policies. The most important point is that digitized and intelligent manufacturing is a must for improving and securing product quality." It would be more accurate to say that the Boteli digitized plant is an innovative practice rather than an extension of the previous development strategy, because it perfectly matches the current national policy, investment orientation and industrial trend. In short, the new plant perfectly matches the "new era of valves".

Own foundries

Boteli's product family mainly consists of ball valve and high performance butterfly valves. The company also manufactures thousands of other valve types from more than 50 series, including gate, globe, check and special valves. In order to better serve its customers, Boteli precisely controls the quality from the very beginning of the production process. As a matter of fact, the disappointing performance of domestic valve products is mainly attributable to the quality of raw materials, Mr. Huang states. Therefore, Boteli started early in 2005 to invest in forgings and castings. It has built and acquired several outstanding foundries and maintained long term and stable operation. Mr. Huang explains: "Our goal is to establish a 'long lasting brand'. The in-house foundry helps to secure the product quality on one hand, and guarantees the time of delivery on the other hand. As a consequence, it's beneficial to our reputation, quality and stable cooperation with our long term customers."

Confident in design

Mr. Huang continues: "As of today, most of Chinese valve companies haven't actively participated in the design package works yet. If one day the valve designers start to do so and get a clear knowledge about relevant parameters such as media, velocity, condition, pressure, installation position and so on, they will become more confident in their designs. It's undeniable that at the

Overview of the Boteli new plant

Being a wholly owned subsidiary of Boteli Valve Group, Zhejiang Boteli Technology Co., Ltd. specializes in valve manufacturing with comprehensive capacity in production, R&D and sales.

As a digital factory, Boteli Technology is a prime example of smart manufacturing with methodical implementation of information technology in plant operations and management. The result is an integrated information system linking the whole production cycle from order taking to after-sale service, paving the way for entering both the domestic and international high-end markets.

Key features of the plant:

- floor area about 65,000m² (net)
- over 500 employees
- equipped with a 3D simulation manufacturing test and design system
- a world-class numerically controlled production center (NCPC)
- CNC machines
- plasma welding machines
- overclocking vacuum heat treatment equipment
- a top class valve testing and examination center featuring testing capabilities covering physical and chemical properties, temperature, NDT, life test, torque, explosion proof, micro-leakage, load on pipeline, strength, micro-leakage sealing.



Boteli has invested significantly in manufacturing capabilities. (photo credits: Boteli)

moment these talents are lacking in China. At Boteli, we are addressing this issue and sending design engineers to learn from design institutions to improve their design capability.”

Boteli takes R&D very seriously, Mr. Huang states. Taking a cryogenic ball valve as

example, the Boteli -196°C side-entry 8” 300lb & 600lb ball valve has passed all the tests and has been installed in a PetroChina-project. Boteli also has developed developing 900lb and 1500lb types for this valve type.

For Boteli, investment in R&D always has accounted for a significant part of its turnover.

Boteli features cryogenic valve products

Boteli cryogenic valve products are widely used in LNG, air separation, ethylene, LPG industries, etc. Main product types include cryogenic ball, butterfly, gate, globe and check valves. All the main structures are made of austenitic material and subject to cryogenic treatment, featuring ultra-low carbon content and higher strength. Cryogenic valves are designed according to MSS SP134, BS6364, SHELL SPE 77/200 and some other advanced international standards. Boteli performs finite element analysis on major parts in order to identify the length and positioning of extended stem and drip plate to ensure compliance with all relevant requirements, the accuracy of product design and high technical content. The extended bonnet mitigates the harsh working condition of packing elements and allows lower open/close torque; advanced design of the drip plate prevents the condensate water from entering the insulation layer; valve body cavity and extended stem cavity are linked through pore channel to prevent abnormal pressure rising; imported sealing elements for critical applications can ensure outstanding sealing performance in cryogenic condition.

Regarding machining, processing and assembly, all cryogenic valves are machined with CNC machines, the sealing surface is treated with the patented Hawking mirror polishing presents perfect mirror-like finish; ultrasonic washing prior to assembly ensures that every part comply with cleanness requirements. A Class 100000 dust free workshop provides a clean environment for cryogenic valve assembly and helps to ensure product quality. Boteli has a large scale cryogenic testing laboratory with a 10m³ liquid nitrogen storage tank, large size liquid nitrogen tank, an automatic test bench with digital display and helium mass spectrometer leak detector, suitable for cryogenic valve testing and helium leak testing.

It's also running so-called industry-academy-research projects in which it actively cooperates with academies, end users and design institutions. So far, Boteli has established a provincial level research institute with significant technical capability and more than 40 technical personnel, amongst which 9 have senior professional titles and 30 have medium-grade professional titles. The team has been rated with honors as member of 'the First group of key innovation teams of companies in Wenzhou Municipality'.

Driving future development by environmental protection

As for the end user sectors, Boteli mainly serves oil & gas transmission, offshore platform, hydrogenation unit, LNG and cryogenic industries. Mr. Huang reveals to us: “In the future, Boteli will pay more attention to the nuclear energy and clean energy market.” Environmental protection is also an issue for the traditional manufacturing industry. In order to handle the emissions, such as the ‘three industrial wastes’, it operates a complete set of facilities and keeps upgrading it. Being a Grade A supplier and framework supplier of PetroChina, SinoChem and CNOOC with the focus on oil fields, refining, piping, storage and transmission business, Boteli enjoys a large portion of the China market and deserves a premium reputation in

natural gas, fine chemical, coal-to-chemical and power industries. After long term development, the BTL brand has been recognized as a symbol of quality. In 2017, the ‘Boteli’-brand was valued at 268 million Yuan by several national authorities including General Administration of Quality Supervision, Inspection and Quarantine, National Institute of Standardization, etc.

Optimistic about domestic gas market

The domestic market accounts for more than 60% of Boteli's turnover. Mr. Huang: “We're quite optimistic on domestic gas market. Comparing with the overseas markets, the development level of domestic gas industry is not high and the pipeline market shows great potential. Since the target is there, we'll strive to achieve it intently. Taking ball valve as example, we've developed top entry, side entry, split body, welded, hard sealing, soft sealing, et cetera. We've achieved significant results with great efforts invested by our technical team. This has been verified by our customers. The automation degree of our products will go higher and higher in the future, and we'll be more and more strict with quality and details. Boteli attaches great importance to quality, service (pre-sale, sales service and after-sales), technical products, R&D and providing custom made auxiliary parts. Our basic philosophy is to ‘Keep updated with the market trend; make proper product positioning; provide quality



Top-entry Cryogenic Trunnion Ball Valve

product’ and that could be the reason for our success in domestic market.”

Actively looking for overseas partners

Overseas business currently accounts for only 33 to 35 per cent of Boteli's total turnover, but this also indicates a possibility to achieve more in exports. As a matter of fact, several international oil companies have been evaluating and verifying the whole Boteli product family. Boteli valve products are starting to serve overseas customers including Petrobras, Rosneft and Gazprom, not only standard products but also the special high pressure products, e.g.: 120cm welded ball valve, 2500lb 8” & 10” ball valve, etc.

More importantly, with the influence of the “one belt one road initiative” (national strategy focused on cooperation with certain geographical regions, ed.), Boteli will focus on “go overseas strategy” in the future, on the basis of existing foreign business, further strengthening and expanding its business in energy and chemical markets; giving priority to the development of high-end products, such as hydrogenation valve, cryogenic valve, line valve etc. After 20 years of development, Boteli has become sophisticated in production, R&D and management. The key for the overall strategy, Mr. Huang states, is to find a good overseas team, especially in the North American market.

Leader in digitalization

Before Valve World left his office, Mr. Huang summarized: “Benefiting from the four major driving power - industrialization, urbanization, reforming (market, environmental etc.) and globalization - the valve manufacturing industry in China has a spectacular future. Within 10 years, new valve types corresponding to major projects will become priority of development. Involved industries include: thermal power generation, nuclear power generation, hydro-electricity, large scale petrochemical plant, oil and gas gathering and transmission pipeline, coal liquefaction and metallurgy. Hopefully this will lead to a rapid growth of the whole valve market. With the advent of internet-plus (4.0, red.) era, industries will become increasingly digital in the future. In accordance with the “one belt one road initiative”, we will continue to uphold the “go overseas strategy” and endeavor to carry out smart manufacturing on the basis of sustainable development, with the ultimate goal of leading the industry in the realm of digitalization and smart manufacturing.”



Top-entry Cryogenic Butterfly Valve