Leading in Welded Bellows
Vacuum valves

In a vacuum valve, the Welded Bellow seals the drive components on the atmosphere side from the vacuum process side while the valve is open. This type of function is known as a feedthrough.

Coating systems

Coating systems that deposit or etch away materials for the semiconductor and solar industries require the most technically advanced edge Welded Bellows to meet increasingly stringent cleanliness and performance requirements. VAT Bellows are the cleanest, longest lasting, and consistent solution on the market.

Innovative and economical Welded Bellows solutions

VAT Bellows are used in various vacuum applications such as the semiconductor industry, as well as in non-vacuum industries like medical technologies and automotive parts.

Leak tight sealing, cleanliness and the guaranteed number of cycles without generating particles are the main features of VAT Welded Bellows.
Research

VAT Welded Bellows are used in a wide variety of synchrotrons throughout the world. The full range of Welded Bellows sizes and materials comes into use. The flexibility, creativity and great technical expertise of the VAT applications engineers provide a significant added value.

Industry

In industrial markets Welded Bellows are typically used without vacuum requirements to consider. However, the primary function to provide a hermetic seal is just as essential. Each application is examined not only for technical requirements but also manufacturing hurdles that need to be overcome to bring a solution to market.

Medicine

In medical devices Welded Bellows can be integrated into a direct implantable into patients with chronic pain or serve a mechanical function in specialty evaluation equipment e.g. CT scanners. VAT Bellows can be realized in several different alloys including Titanium F67 (pure titanium) and SST 316L.

Automobiles

The damper capsule that is built into a high-pressure pump compensates pressure surges in the fuel injection system of motor vehicles. The high volume of several million per year requires fully automated manufacturing as well as stable processes.
For InnoVATion, quality starts with the smallest detail.
Quality and excellence during all stages of manufacturing

Planning / Design

While considering optimal technical functions and taking into consideration the various commercial terms, the most successful development path involves close cooperation with the customer in all phases. Therefore, the first stage of designing begins with understanding the customer’s system and the exact function of the Bellows. On the planning side, it is critical to understand key milestones of a product launch schedule so the necessary accommodations can be made promptly.

Standard and Custom Sizes

We currently have more than 150 variations of diaphragms that are actively in use. The range of sizes and variations is constantly expanding to keep up with market demand. A development that is defined in detail and with clear calculation rules guarantees the shortest time between simulation and first delivery/series production.
Stamping

One of VAT’s core competencies is the punching and embossing of diaphragms. The selective use of different presses (with punching forces from 30 t to 800 t), a high degree of automation as well as the ability to produce all the tools on site permit continuous mass production of standard sizes for Welded Bellows, from an inner diameter of 2.7 mm to an outer diameter of 810 mm.

Cleaning

Cleaning of single components
All single diaphragms and end-pieces are ultrasonic wet-cleaned. The processes take place in a cleanroom environment up to ISO class 5. Alkaline detergents with a high pH-value are used to clean the incoming parts which finally are rinsed in ultrapure water. The parts then remain in a controlled environment for final assembly, inspection and packaging.

Final cleaning of complete bellows unit
Different applications of our customers require different cleanliness levels. We deliver our bellows exactly as clean as they are desired, to enable our customers to be economical and work with the needed quality at the same time.

To achieve economic flexibility, we defined three cleanliness levels, which differ mainly in the final cleaning process: standard level, advanced level and high-purity level (HPu).

For further information please see our brochure “Cleanliness in perfection”.
Welded Bellows production

VAT is a world leader in the production of Welded Bellows, and especially in process automation. The entire Welded Bellows production system is located in a cleanroom of class ISO 8; the high degree of automation of the laser welding machines is ideal for the production of large batches. The manual workstations, equipped with microplasma devices or lasers, enable cost-effective production of single pieces and small series.

For VAT, there is both an incentive and an obligation to continuously improve our technologies and processes and to be fully committed to creating the maximum added value for our customers.

Quality management

VAT Welded Bellows are guaranteed to have a leak tight pressure barrier and will perform reliably based on your specific design parameters. All Bellows are leak tested for hermetic sealing capabilities using helium mass spectrometer analysis. Completed Bellows units are pulled at random and tested to verify the Bellows performance meets the design requirements. Customized quality control programs can be developed to fit your unique application needs.

VAT’s Quality Management System is ISO 9001 certified with detailed records throughout the manufacturing process. Records that can be made available to customers include First Article Inspection Reports, raw material certificates for traceability down to a specific lot, and incoming inspection records for purchased parts.
Testing and analysis

In order to monitor the service life under realistic conditions, our testing and analysis laboratory contains extensive testing facilities. Depending on the application, cycle tests can be carried out not only with linear movements, but also with lateral ones, with internal or external vacuums and at elevated temperatures. Metallurgical cross sectioning of welds or of new materials are carried out in our in-house laboratory. Fracture mechanics analyses with external partners often give the end user important information regarding the prevention of damage in everyday use.

Machine shop

Precision machining and VAT’s stable welding process results in a durable and reliable joint at the highest stress point in any Welded Bellows assembly, the end-piece-to-membrane transition. VAT’s capabilities and extensive experience allow for the production of customized Bellows end pieces in fast turnaround. VAT continues to invest in the latest equipment to increase efficiency and grow machining capabilities to support the most technically demanding markets.

Service / support

VAT delivers the highest quality in areas of technology, system processes, engineering, customer service, and support. It begins with a concept and lasts the entire life of our product.
Innovation, Leadership, Reliability

VAT focuses on using our core competencies of vacuum technology, engineered solutions, automated production and high purity cleaning to produce the highest value Welded Bellows on the market. Whether the application is based on well-known requirements, or a non-traditional application in an emerging technology, we can provide a leak-tight and flexible solution.

For our customers and suppliers, we are a competent, reliable and fair partner who honors its agreements. VAT offers excellent quality for its products and services, and strives for 100% supply dependability together with customer-friendly delivery times.

The driving force behind all our effort is the satisfaction of our customers.

Arno Zindel
Vice President VAT Bellows
Responsibility  Fairness and openness within the company and in our dealings with our customers are outward signs of the corporate culture that we practice. Medium- and long-term thinking, environmentally friendly action, customer satisfaction and a high degree of continuity in the quality and availability of our services are at the forefront of our corporate commitment.

Quality  We live quality. We rely on the decisions and actions of our employees who feel personally responsible for the quality of the parts and who work according to the zero-defect principle. VAT examines all stages of production guided by testing methodologies through final analysis to identify the smallest deviations from the required quality. The practiced process of continuous improvement is evident in every employee.

Solutions  VAT Welded Bellows are the result of innovative design, competent production and continuously improved processes. With customized solutions, we underline our commitment to providing innovative and technologically advanced products.

Perfection  Our Welded Bellows meet the highest requirements in terms of cleanliness, reliability and sealing. Each finished Welded Bellows unit is subjected to a helium leak test to guarantee a 100% seal. Our Welded Bellows are particle-free in the production process.

Added value  Customers can count on VAT’s extensive knowledge base in a variety of industry applications. For this reason, VAT differentiates itself as a specialist in the implementation of complete solutions that use Welded Bellows. It is our edge in this knowledge, realistic test facilities and a wide range of analytical possibilities that VAT creates optimum value for our customers.

Engineered Solutions
VAT Worldwide

USA
San Jose (CA), Woburn (MA)

EMEA
Haag, CH – Headquarters

Malaysia
Penang

South Korea
Pyongtaek-City

China
Shanghai

Taiwan
Hsin-Chu City

Japan
Yokohama, Himeji

Japan
Yokohama, Himeji

For more information go to www.vatvalve.com