

Valves

VAT's Valves segment designs and delivers the industry's broadest range of high-precision vacuum valves. In 2022, the segment comprised three business units: Semiconductors, serving the semiconductor sector; Display & Solar, serving the high-end flat-panel display and solar photovoltaic markets; and Advanced Industrials for customers in a variety of industries and in scientific research*. The Valves segment operates manufacturing facilities in Switzerland, Malaysia and Romania, with sales, product development and engineering support in all major markets.

Demand in 2022 continued to grow strongly over most of the year, driven by the third year in a row of higher customer investments in wafer fabrication equipment (WFE), close to USD 95 billion. This was largely driven by long-term megatrends, such as the spread of personal digital devices, cloud computing, the Internet of Things and the rapid development of artificial intelligence. The use of semiconductors in cars and trucks also grew rapidly. Additionally, semiconductor manufacturers continued to develop new chips with smaller node sizes and more wafer layers for coming generations of digital devices, which drove investment in new production platforms. These included, for example, new fabrication technologies such as Extreme Ultraviolet (EUV) lithography, which is used in only the most advanced chip manufacturing processes.

The segment's other markets also developed positively in 2022. The use of vacuum-based manufacturing continued to expand into various industries, such as precision coatings and electron beam equipment used in medical applications, 3D printing and scientific research. Demand in the solar photovoltaic sector also grew again on the back of increasing demand for renewable energy and more efficient solar cell technologies. The displays market remained soft as investments to manufacture organic light-emitting diode (OLED) displays were delayed, in part by more cautious consumer spending.

Demand softened in the second half of 2022 as chip manufacturers began to reduce capital investments in response to short-term macroeconomic factors, such as increasing interest rates and risks of economic slowdowns in many large markets, along with announced trade restrictions towards China.

Another strong year of growth in Semiconductors

The semiconductor market accounts for approximately 75% of VAT's total sales and is thus the key driver of growth. Net sales grew 34% to CHF 714 million, driven by higher spending earlier in the year in logic and memory chips, both legacy platforms as well as high-end applications for the latest generation of semiconductors. Sales also benefited from the company's ability to deliver despite supply constraints in the semiconductor value chain, thanks to its broad global footprint and ongoing supply chain improvement measures. Softer demand in the second half of 2022 resulted in a 5% full-year order decline in the Semiconductor business unit, to CHF 730 million from CHF 772 million in the prior year.

The number of specification wins, in which VAT collaborates with customers to develop vacuum technologies for coming generations of wafer fabrication equipment, remained at high levels in 2022, mainly in vacuum components and sub-systems for critical front end processes such as etching and deposition. The segment also increased sales of adjacent products, such as motion components and advanced modules.

VAT continued to bring new valves to market along with technologies that enhance the performance of its core products. These included high-precision pressure control products, and ultra-pure components and coatings that improve the durability, vacuum performance and yield of chip fabrication equipment. The company also qualified new valve modules and advanced assemblies for equipment being designed for sub-5-nanometer applications.

* As of Jan. 1, 2023, the Display & Solar business unit was dissolved, with the display business integrated into the Semiconductor business and the Solar business moved to the Advanced Industrials business unit. The moves are intended to take advantage of synergies and scale economies related to technology, business drivers and customer needs.

Key figures Valves

In CHF million	2022	2021	Change
Order intake	970.9	1028.8	-5.6%
– Semiconductor	730.4	772.2	-5.4%
– Display & Solar	64.9	93.3	-30.4%
– Advanced Industrials	175.6	163.3	7.5%
Net sales	932.7	729.2	27.9%
– Semiconductor	716.5	534.7	34.0%
– Display & Solar	71.1	65.6	8.4%
– Advanced Industrials	145.1	128.9	12.6%
Inter-segment sales	89.2	75.0	18.9%
Segment net sales	1,021.9	804.2	27.1%
Segment EBITDA	354.5	269.7	31.9%
Segment EBITDA margin	34.7%	33.4%	
Segment net operating assets	840.4	737.7	13.9%
of which net trade working capital	260.9	191.0	36.6%

The Semiconductor business unit also continued to qualify additional products for manufacture at VAT's plant in Penang, Malaysia. This secures dual sourcing capability for key products in both Europe and Asia. It also further develops the local supply chain, part of VAT's strategy to better support its strong customer base in the region and improve the overall flexibility and efficiency of its global footprint.

Advanced Industrials continues to grow

The Advanced Industrials business unit serves a wide variety of customers with vacuum-based technologies in areas such as scientific instruments, crystal pulling for silicon production, thin-film coatings and scientific research. The business achieved another record order intake in 2022 of CHF 176 million, up 7% compared with the previous year, while net sales increased 13% to CHF 145 million.

Demand was strong across several markets, especially electron beam-related scientific instruments. The super-thin coatings market, which includes optical lenses, smartphone components and batteries, was flat in 2022 as the result of lower demand for consumer electronics related to the macroeconomic uncertainties that developed over the year.

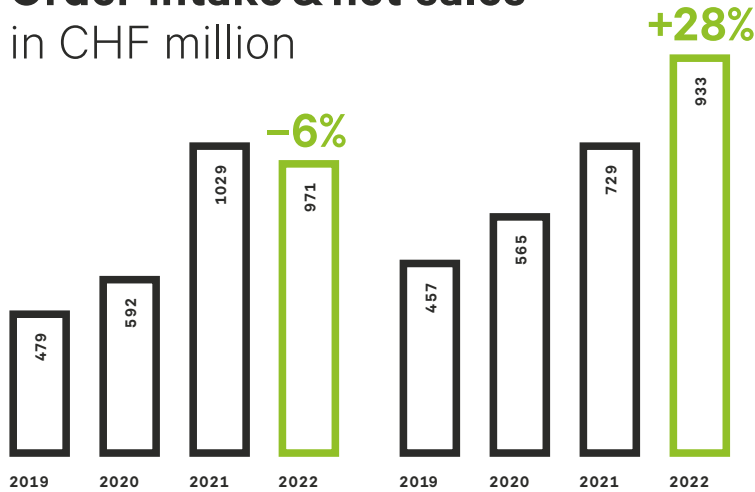
The business unit gained market share in Europe and China, largely by leveraging VAT's ability to deliver integrated valve solutions tailored to customers' specific technology requirements, especially in control valves.

Demand strong in Solar, soft in Displays

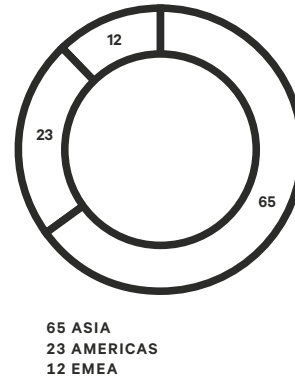
VAT's Solar & Display business unit, its smallest, serves the solar photovoltaic and displays markets with vacuum valve solutions similar to those used in the manufacture of semiconductors, which uses related manufacturing processes under very high vacuum conditions.

Orders in 2022 declined by 30% to CHF 65 million, mainly the result of ongoing delays in capital investments for the fabrication of OLED display which could not be offset by stronger spending on solar panel manufacturing, especially in China. Net sales increased by 8% to CHF 71 million.

Order intake & net sales in CHF million



Net sales by region %



Performance review 2022

Total orders in the Valves segment in 2022 amounted to CHF 971 million, down 5% from the previous year. Net sales reached CHF 933 million, an increase of 28% compared with CHF 729 million in 2021. Geographically, the share of total segment sales increased in Asia, while remaining the same in Europe and declining in the US.

The segment reported EBITDA of CHF 354.5 million, up 32% from the year before, and an EBITDA margin of 34.7% versus 33.4% in 2021. The improved profitability was due to volume effects, increasing demand for higher-end vacuum solutions needed to manufacture the latest semiconductor designs, and ongoing operational improvements, including increasing component and raw material supplies from best-cost countries.

Market Outlook 2023

The 2023 market outlook for the Valves segment presents a mixed picture. Lower capital spending in semiconductor manufacturing, reflecting ongoing macroeconomic uncertainties, is expected to continue. Restrictions on trade with China for semiconductor-related products and technologies are also expected to reduce overall near-term demand for wafer fabrication equipment. New investments in OLED displays are also forecast to remain muted in 2023. At the same time, growth is expected to continue for vacuum valve solutions in industrial markets and solar photovoltaic, and VAT intends to further drive targeted growth measures to gain share in product adjacencies such as motion and pressure controls, as well as expanding its industrial exposure in new technologies, such as electron beam applications.

Global Service

The Global Service segment had a record year in 2022, with significant growth in all major areas of the business: spare parts and gates, valve repair, and complete valves, including upgrades to existing VAT valves, retrofitting of competitor valves, and spare and subfab valves. The segment serves wafer fabrication equipment OEMs, as well as integrated device manufacturers (IDMs) who design and manufacture semiconductors in-house primarily for their own use, and foundries who manufacture chips on behalf of companies that design the semiconductors but who outsource their fabrication.

Growth is driven primarily by VAT's installed base of valves, currently some 1.5 million worldwide. The company's constantly increasing portfolio of valve upgrades and retrofits also supports growth, allowing VAT to increase market share with the OEMs. At the same time, VAT is implementing more targeted programs to support the IDMs and foundries with comprehensive service solutions.

Semiconductor manufacturers continued to invest heavily in new capacity through most of 2022, which drove record sales of subfab valves used to isolate the extremely clean process environments in the semiconductor "fab" from the pumps and chemical disposal systems typically located below the fab.

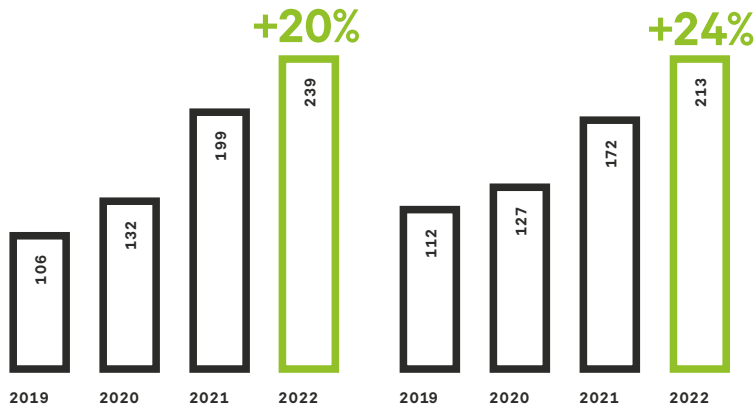
At the same time, utilization rates in the industry remained extremely high as fabs strove to achieve maximum productivity and throughput from their existing equipment. As a result, demand was also strong for consumables and spare parts.

The Global Service segment also moved and upgraded three of its eight global service centers in late 2021 and in 2022—in Japan, South Korea and Taiwan—to provide key customers in the region with even cleaner facilities for valve repair and maintenance.

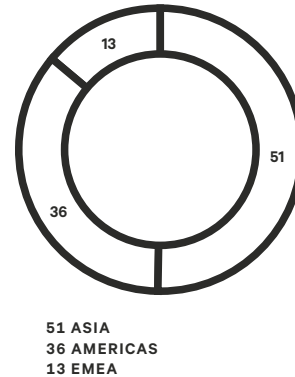
Key figures Global Service

In CHF million	2022	2021	Change
Order intake	239.0	199.1	20.0%
Net sales	212.7	172.0	23.7%
Inter-segment sales	-	-	-
Segment net sales	212.7	172.0	23.7%
Segment EBITDA	96.6	78.8	22.6%
Segment EBITDA margin	45.4%	45.8%	
Segment net operating assets	131.8	122.3	7.8%
of which net trade working capital	36.4	27.6	31.9%

Order intake & net sales in CHF million



Net sales by region %



Performance review 2022

Orders in the Global Service segment increased 20% year-on-year to a new record of CHF 239 million. Net sales grew 24% to CHF 213 million, also a record. Growth was reported in all businesses and was strongest in upgrades and retrofits, partly reflecting the launch of new control valve upgrades. EBITDA grew 48% versus 2021, to CHF 79 million. The EBITDA margin increased to 46%, mainly reflecting differences in product introduction costs between the two years.

Market Outlook 2023

With the semiconductor industry cycling into lower levels of fab utilization in 2023, VAT expects decreasing demand for consumables and spare parts. The company expects this to be largely mitigated, however, by growing demand for upgrades and retrofits as manufacturers look to improve yield and productivity. VAT's expanding portfolio of new valves and motion components is also expected to start opening new service opportunities, along with the launch of new service products specifically tailored to the different needs of legacy fabs wanting to maintain high utilization rates, as well as leading-edge fabs that need transition to smaller node sizes.