

Valves

The Valves segment offers the industry's broadest range of high-precision vacuum valves, both standard and customized products and modules. The segment serves mainly original equipment manufacturers (OEMs) and in 2020 comprised three business units: Semiconductors, serving the semiconductor sector; Display & Solar, serving high-end flat-panel display and solar photovoltaic OEMs; and General Vacuum for customers in research and OEMs in various industries. The Valves segment draws from VAT's manufacturing facilities in Switzerland and Malaysia, plus sales, service, and engineering operations in all major markets.

Demand in 2020 was stronger than the previous year, mainly reflecting the continuation of the cyclical recovery in the semiconductor sector. This is being driven by increasing demand for logic and memory chips as well as further advances in the technological complexity of semiconductors that requires new production capacity. As a result, semiconductor-related orders and net sales continued their positive trend throughout the year, leading to near record sales for the segment.

The demand impact of the global COVID-19 pandemic on the Valves segment was mixed: while the sharp slowdown in many economies created significant uncertainty and softer demand in the display, photovoltaic and industrial end markets, the pandemic also acted to accelerate some trends that are positive for semiconductor demand, such as the shift to home office and remote working as well as increased online commerce.

The longer-term growth drivers for vacuum equipment remain unchanged, driven by digitalization megatrends. The increasing cost competitiveness of solar photovoltaic energy, based to a large extent on new manufacturing processes that make solar cells more energy efficient, is also expected to support demand in this market over the long term.

Semiconductor market remains positive

The Semiconductor business unit, VAT's largest, reported new records in orders and net sales in 2020. Net sales increased by over 45% year on year, driven mainly by the foundry and logic segments, but also supported by sound growth in memory. The expansion of chip manufacturing capacity in South Korea as well as new capital investments in China to build local semiconductor manufacturing capabilities also drove higher sales.

In addition, increasing chip complexity requires purer vacuum environments and more process steps under vacuum. This is reflected in another strong year for specification wins in 2020 on new products needed to make the next generation of semiconductors. This allowed VAT to increase its global semiconductor valve market share to 70%. The high level of specification wins is also expected to support sales growth over the coming two to five years.

VAT continued to launch new customized products and modules, which comprise multiple valves and other components, such as lifters, shutters, heating and cooling components, and diffusers. In particular, VAT introduced new control and transfer valves that increase the speed and precision of pressure control applications and particle-free wafer handling. These are key to increasing yield and productivity in chip manufacturing.

The company also continued to qualify its latest valves for production at its plant in Penang, Malaysia, which now manufactures approximately 30% of VAT's product portfolio. The company also invested in additional manufacturing technologies and engineering and product management resources at the facility, which will continue to play a key role in VAT's ability to further build its strong customer base in the region and to improve the overall flexibility and efficiency of its global manufacturing and supply footprint.

The Semiconductor business unit also increased research and development collaboration with leading chip suppliers in 2020 to secure its technology lead, and dedicated more engineering resources to the development of connected solutions that integrate control, computing and communication capabilities, allowing them to be used in new generations of process automation and smart factories.

Cyclical low in Display business, Solar impacted by pandemic

Demand in the Display & Solar business unit in 2020 was softer than the year before, resulting in lower net sales. An important growth driver in the display business is the long-term shift from liquid crystal displays (LCDs) to organic light-emitting diode (OLED) displays, since the manufacture of OLED screens – especially the new generation of flexible touch-screen products – is more complex and requires more process steps under vacuum. Equipment demand in this business is currently at a cyclical low, reflecting medium-term capital investment trends. VAT could partly offset this development with higher sales of transfer valves used to manufacture large LCD TV screens.

The Solar business was significantly impacted by the COVID-19 pandemic, especially at the beginning of the year when China – where much of the business is focused – implemented strict measures to control the pandemic. Demand has since recovered but not enough to offset the downturn seen in the first half of the year. Growth in the Solar business is expected to resume in 2021 as long-term drivers regain traction, primarily the increasing cost and efficiency competitiveness of solar energy generation compared with fossil fuels. Major solar companies have announced large capacity expansion plans that rely heavily on new technologies, such as heterojunction (HJT) manufacturing, that improve the efficiency and energy yield of solar cells at lower costs and that require new vacuum valve solutions.

General Vacuum: stronger research orders

Demand in the General Vacuum business was driven by advanced, high-end vacuum applications especially in the US and Asia. General Vacuum won several major orders with national research labs in Japan, South Korea and the US. The business also successfully entered new markets in China with its strong portfolio of isolation and control valve technologies. Overall, orders grew about 11% as demand

Key figures Valves

In CHF million	2020	2019	Change
Order intake	577.8	463.0	24.8%
Net sales	550.4	440.9	24.8%
Inter-segment sales	59.9	51.6	16.0%
Segment net sales	610.2	492.5	23.9%
Segment EBITDA	196.9	136.3	44.4%
Segment EBITDA margin	32.3%	27.7%	
Segment net operating assets	654.3	638.9	2.4%
of which net trade working capital	126.3	103.0	22.6%

in Asia and the US more than offset a decline in Europe resulting from the temporary shutdown of some customer facilities due to the COVID-19 pandemic.

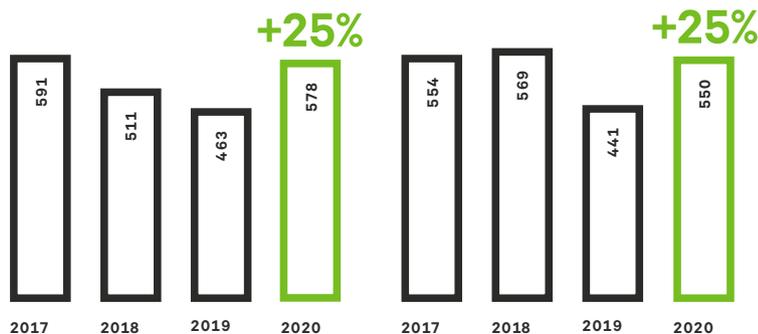
Performance review 2020

Net sales in the Valves segment in 2020 amounted to CHF 550 million, 25% higher than the year before. Sales were higher in the Semiconductor business, reflecting the cyclical market recovery and market share gains, while sales declined in Display & Solar and General Vacuum. Segment EBITDA increased by 44% to CHF 197 million. The EBITDA margin was 32%, nearly 5 percentage points higher than in 2019, reflecting both higher volumes in the Semiconductor business as well as continued operational improvements and increasing demand for more technologically advanced products.

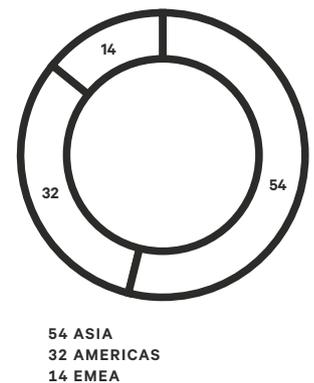
Market outlook 2021

For 2021, VAT expects its semiconductor-related markets to continue to grow across all segments – logic, foundry and memory. The market for VAT’s Display & Solar business is forecast to soften, with the ongoing cyclical slowdown in displays expected to more than offset growth in solar. VAT also expects higher sales in its General Vacuum business in 2021, assuming an improvement in the pandemic situation in Europe during the latter part of the year.

Order intake & net sales
in CHF mn



Net sales
by region %



Global Service

VAT's Global Service segment supplies both OEM and end user customers in all key markets with original spare parts, valve maintenance and service, technical support, and training. In addition, Global Service helps customers to improve equipment performance with customized product upgrades and equipment retrofits. The business is driven by the needs of customers to improve the performance of their existing installed base of equipment, whether increased uptime, lower energy consumption, higher process purity or faster and simpler maintenance and repair.

With more than one million serviceable VAT valves installed worldwide, the company's service business provides a key lever for strengthening customer relationships and is an important sales channel for VAT products. Furthermore, service is a business with stable profitability and cash flow through the cycle. In addition to normal servicing of valves that may need repair or refurbishment, VAT

provides upgrades and retrofits for all the major vacuum equipment platforms in the industry, both deposition and etch systems.

VAT also operates the industry's largest global network of service and repair centers, located in eight countries, including six in Asia. VAT's Global Service segment also develops service products for specialized valve applications, such as its expanding portfolio of products for subfab systems used in pumping and abatement systems operating in harsh conditions below the fabrication floor. This includes a recently launched quick shut-off valve (QSV) which helps to prevent damage and yield loss in a chamber due to unexpected pump failures or sudden loss of power.

Key figures Global Service

In CHF million	2020	2019	Change
Order intake	132.2	106.4	24.2%
Net sales	127.3	111.8	13.9%
Inter-segment sales	-	-	-
Segment net sales	127.3	111.8	13.9%
Segment EBITDA	53.2	46.3	14.9%
Segment EBITDA margin	41.8%	41.5%	
Segment net operating assets	119.4	114.2	4.6%
of which net trade working capital	23.7	13.8	71.4%

Performance review 2020

Net sales amounted to CHF 127 million in 2020, an increase of 14% compared with the year before. Growth was strongest in upgrades and retrofits, where the full deployment of new products launched in 2019 drove up sales in this business by more than 15% in 2020. This included sales of new transfer valve products used to achieve an immediate increase in yield in existing semiconductor fabs. Higher demand for subfab solutions in new semiconductor plants in China also supported growth. Sales growth in the service and repair business was driven in large part by the further rollout of the company’s Fixed Price Repair/Refurbishment program, which provides global customers with simple and consistent servicing of their valves with factory-original parts across all of their fab locations.

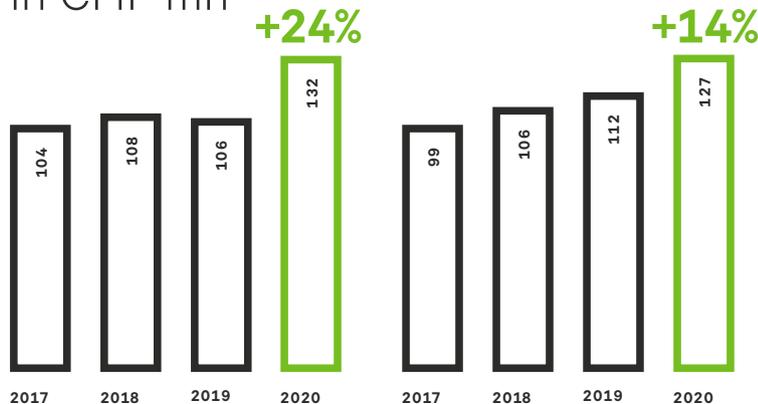
The EBITDA margin remained at a healthy 42%. Investments in new products offset gains from higher volumes.

ductor sector as well as higher sales from new service products launched in 2020 and the expansion of the upgrade and retrofit portfolio into control valve applications. Capital investments into new chip manufacturing plants is expected to remain high in 2021, which is also expected to drive demand for subfab valve solutions.

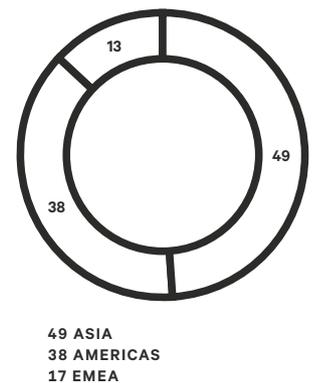
Market outlook 2021

VAT expects the market for its Global Service business to continue to grow in 2021. This reflects both the expected continued strength of the semicon-

Order intake & net sales
in CHF mn



Net sales
by region %



Industry

The Industry segment primarily serves the automotive sector with thin-metal membranes used in the manufacture of dampers for high-pressure fuel injection pumps. They act to maintain a steady fuel supply, even during dramatic changes in fuel demand, and thus are essential to achieving the high levels of fuel efficiency needed in today's internal combustion engines.

After the transfer of the bellows business into the Valves segment in 2019, VAT continued to reposition its Industry segment by phasing out certain activities at its factory in Romania that were not related to its core vacuum valve business.

Performance review 2020

Orders and net sales in the Industry segment declined by 7% and 17% respectively, amounting to about CHF 15 million each. This decline mainly reflects the exit from non-valve-related activities in VAT's operations in Romania. Demand in the automotive sector in 2020 was severely impacted by production cutbacks caused by the COVID-19 pan-

dem, especially in Europe. VAT's exposure to the Asian market, however, along with its success in maintaining production and product deliveries through the pandemic allowed it to mitigate most of this impact.

Segment EBITDA increased by 42% as a result of further automation of production, including benefits realized from the fully automatic laser-welding robots installed in 2019.

Key figures Industry

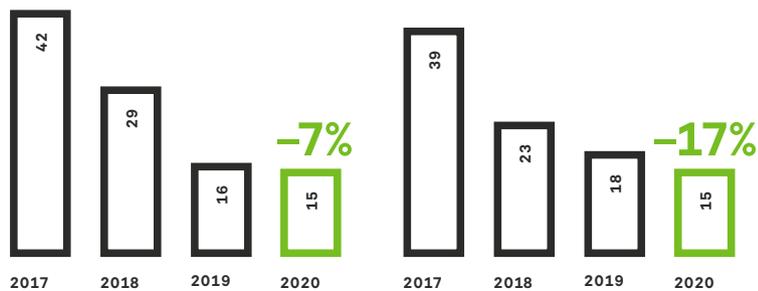
In CHF million	2020	2019	Change
Order intake	14.5	15.5	-6.5%
Net sales	14.8	17.8	-16.8%
Inter-segment sales	10.0	8.9	11.3%
Segment net sales	24.7	26.7	-7.4%
Segment EBITDA	4.0	2.8	42.4%
Segment EBITDA margin	16.4%	10.6%	
Segment net operating assets	33.9	29.5	14.9%
of which net trade working capital	12.6	5.1	145.8%

Market outlook 2021

For 2021, VAT expects demand from the automotive market to remain steady, while ongoing operational and productivity improvements are expected to support profitability.

Starting Q1 2021, VAT will integrate the activities of the Industry segment into the General Vacuum business unit and report it within the Valves segment.

Order intake & net sales
 in CHF mn



Net sales
 by region %

