

## m-u-t

### Contact-free optical measurement

The m-u-t group provides flexible measurement technology, which is at the heart of innovative systems that OEMs are developing to support a switch to flexible production techniques, diagnosis of medical conditions at the point of care and smart farming. Management has transformed the group from a loss-making, debt-laden organisation into one that is consistently profitable, cash-rich and poised for further growth.

#### Building a profitable platform

Over the last four years management has transformed the group – cutting costs throughout the organisation, selling off or closing unprofitable operations and focusing activities on providing products and services to OEMs in Europe, North America and Asia. Having completed the restructuring and stabilisation phase during H116, management is now concentrating on growth, investing €2.0m in R&D during the year and acquiring a minority stake in APOS in August 2016. This acquisition epitomises the future direction of the growth. APOS is situated at the upper end of the value chain, deploying non-contact measurement technology in systems used in the board industry and in biomass power generation plants to determine the moisture and content of wood.

#### Record sales and profits in FY16 with more to come

Group revenues rose by 5% (€2.4m) year-on-year to a record €54.5m in FY16. This was driven by strong growth in revenues attributable to the life sciences segment (60% increase) and the green tech segment (34% increase) as the group focused on products and services for OEMs. EBIT rose by 15% to a record €6.8m and EBIT margin by 1.2pp to 12.6%. FY17 has started well with a 17% year-on-year increase in sales in Q117 to €16.4m and a 38% rise in EBIT to €2.9m.

#### Valuation: Trading at a discount to peers

A comparison of m-u-t's prospective EV/Sales, EV/EBITDA and P/E multiples with those in our sample of European listed companies involved in instrumentation shows m-u-t trading at a discount to the sample mean on all metrics (EV/Sales 1.2x vs 2.9x for sample, EV/EBITDA 7.2x vs 14.5x for sample, P/E 17.9x vs 22.4x). We note that m-u-t remains towards the lower end of the sample range on EBIT margin and consensus estimates show it growing more slowly than most of the sample companies.

#### Consensus estimates

Year end	Revenue (€m)	PBT (€m)	EPS (€)	DPS (€)	P/E (x)	Yield (%)
12/15	52.1	5.5	0.64	0.0	23.3	N/A
12/16	54.5	6.5	0.76	0.0	19.6	N/A
12/17e	55.5	6.7	0.82	0.0	18.2	N/A
12/18e	57.0	6.8	0.83	0.0	17.9	N/A

Source: Company data, Bloomberg

#### Measurement instruments

22 June 2017

Price **€14.89**  
Market cap **€71m**

#### Share price graph



#### Share details

Code	M7U
Listing	Deutsche Börse Scale
Shares in issue	4.8m
Net cash as at 31 December 2016	€5.2m

#### Business description

m-u-t is an integrated provider of photonics solutions based on a common technology platform. It uses non-contact optical technology to create customised systems for OEMs, which are deployed in the clean tech, life sciences and green tech sectors.

#### Bull

- Ability to provide customised solutions for OEMs.
- Addresses high-growth emerging markets.
- Multiple sectors give resilience.

#### Bear

- Dependent on customer activity to drive sales.
- APOS acquisition a drag on margin growth.
- Modest revenue growth guidance.

#### Analysts

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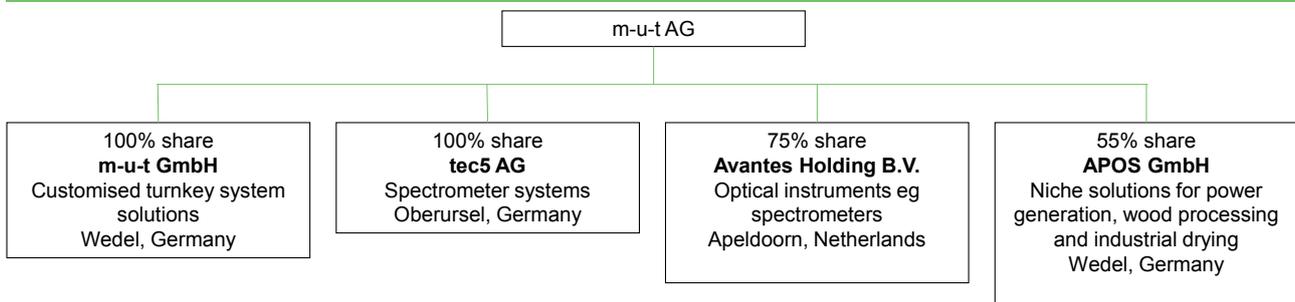
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## Company description: Measuring light

m-u-t AG is a vertically integrated group that designs and manufactures non-contact, non-destructive optical measurement tools. These range from individual instruments such as spectrometers and light sources (Avantes), through complete spectrometry systems (tec5) to complete customised turnkey system solutions (m-u-t GmbH) and highly specialist systems for use in power plants, the board industry and industrial drying processes (APOS). The design of these products requires specialist skills in spectrometric in-process analytics, measurement and automation technology. The products are deployed in a diverse range of applications areas including industrial sensing, agriculture, laboratory automation, medical technology, early fire detection and transportation. These follow independent cycles, giving the group resilience against a potential downturn in any one market.

### Exhibit 1: Group structure



Source: Company data

The original company in the portfolio, m-u-t GmbH, develops customised system solutions based on non-contact measurement technology. It was founded in 1995 and listed in 2007. Since then the group has pursued a “buy-and-build” strategy. In 2007 m-u-t acquired a 51% stake in tec5, a developer of UV/VIS/NIR and RAMAN measurement systems for process applications. In 2008 it acquired a 51% stake in Avantes, a developer of miniaturised fibre optic spectroscopy instruments. In August 2016, it acquired a 55% stake in APOS, a developer of optical measurement solutions for the wood processing power generation and industrial drying sectors. Since the original investment, the holding company has increased its holdings in both tec5 and Avantes.

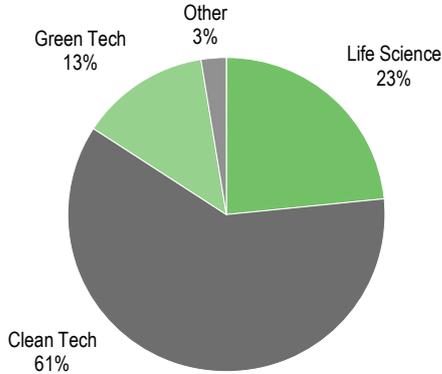
m-u-t AG employs around 250 people, approximately one-third of whom are development engineers. It is headquartered in Wedel, near to Hamburg in northern Germany, where the m-u-t GmbH and APOS subsidiaries are located. Avantes is based in Apeldoorn, the Netherlands, and tec5 in Oberursel, Germany. Products are manufactured in house at each of these subsidiary sites as well as at the tec5 operation in the US and the Avantes operation in China. There are also sales office in China, Hong Kong, the UK and the US. The route to market varies with level of integration. Avantes generates around half of its revenues from direct sales to customers. The other subsidiaries sell predominantly to OEMs. Although the group is highly vertically integrated, the products are sold under the brands of their respective subsidiaries or the OEM brand name. While each subsidiary has a dedicated salesforce, cross-selling is encouraged.

## Business description

m-u-t’s smart photonics solutions are based on a platform deploying a fibre optic spectroscopy. This analyses the different wavelengths in the light striking the sensor, detecting light from the ultraviolet end of the spectrum, through visible wave lengths to the near infrared end of the spectrum. This spectral information is passed into customised process control systems to create complete turnkey solutions for OEMs serving the life science, clean tech and green tech sectors. A high degree of

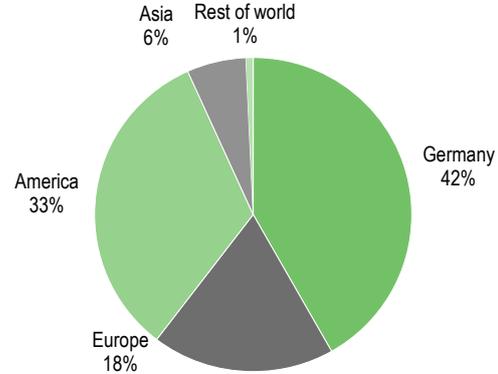
efficiency is derived from using the same basic platform, scaled up if required, in different application areas. We note that the non-sector specific nature of its products means that Avantes is not always aware which sector its optical instruments are deployed in. Those revenues where the sector is not known are placed in the 'other' category.

**Exhibit 2: Revenues by segment FY16**



Source: Company data

**Exhibit 3: Revenues by geography FY16**



Source: Company data

### Life science segment

m-u-t offers a wide range of automation solutions that make medical diagnostics more effective and efficient. Many hundreds of large laboratories worldwide use OEM devices that incorporate m-u-t's proven, reliable and patented step conveyor, which can handle up to 2,000 test tubes per hour. This module is accompanied by decappers and recappers that can handle up to 1,500 tubes/hour. Customised equipment developed for specific customers includes input-output modules for analysis equipment, which not only transfers the tubes from a bulk loader to a puck on the track system in such a way that the barcodes are aligned, but also reads the barcodes and identifies the cap colour and tube geometry, passing these data to the control software. The spectroscopic equipment is beginning to be used to measure blood parameters.

m-u-t is also involved in instrument sterilisation. This is particularly important with the rise of nosocomial infections such as those caused by MRSA, which provide healthcare systems with new challenges. m-u-t's systems are characterised by a high process speed and sustainable reliability. They are able to withstand extremes and large fluctuations in temperature, high mechanical stress and contact with strong chemicals used for disinfecting apparatus. For example, m-u-t has developed solutions for reprocessing flexible endoscopes, identifying which instruments have passed through the appropriate sterilisation equipment by means of RFID technology. Another example is a protein analyser that enables the automatic measurement of protein levels in an instrument sterilisation system, giving immediate quality control over the process. This protein analyser offers some very interesting possibilities in medical diagnostics. It may also be used to detect proteins present in water or air samples.

### Clean tech segment

For over 20 years m-u-t has offered its customers expertise in developing optical measurement solutions over a wide spectral range. The information on the spectrum can be analysed to determine the quality of coatings on glass, plastic foils or metal sheets, film thickness, moisture concentration, sheet resistance and colour, the concentration of gases and surface temperature. These data are extremely useful in building a process control system. m-u-t creates customised solutions that are used by a wide range of industrial producers and plant operators to optimise processes and generate sustainable cost savings. These include production control of integrated circuits, LEDs and displays; in-line measurement of coatings on photovoltaic cells; monitoring biogas plants; purifying water in the third world; monitoring and regulating UV light sources used to

cure inks; measuring the thickness and electrical property of individual layers during the manufacture of photovoltaic cells; detecting counterfeit or adulterated gasoline; monitoring the quality of recycled water; checking for bacteria and toxins in food; and saving water when operating sanitary facilities in railway trains. Control systems on trains are subject to industry-specific regulations, making this a very defendable niche. More generally, this ability to monitor and control processes is a key element of fully automated or smart factories, often referred to as Industry 4.0.

m-u-t's early fire detection system combines video surveillance, temperature measurement, alarm and extinguishing in a single application. It checks the monitored area automatically and continuously, monitoring set temperature limits and temperature trends. Full system integration means that the data regarding the exact location of the hot area are used to direct water or other material used to extinguish the fire. By monitoring surfaces using long-wave infrared detectors, the system gives a warning of thermal abnormalities before other commercially available systems can, allowing remedial action to be taken.

## **Green tech segment**

m-u-t's optical measuring technology is deployed in agricultural applications for real-time analysis of moisture content and substances such as starch, protein, fat, sugar, ash and plant nutrients. The technology is used to check the nutritional content of freshly harvested, still partially damp crops such as maize, grass, alfalfa, corn maize, cereals and oilseeds. Similarly, the amount of useful fertiliser ingredients such as nitrogen, ammonium nitrogen and potassium oxide in slurry and solid manure can be determined. In the area of soil sensors and soil analysis, m-u-t's technology is deployed in customised multi-sensor systems, for example monitoring moisture content, pH levels, humus content, soil texture and the level of nutrients such as nitrogen and phosphate, then analysing that data to determine the amount of fertiliser to apply. This more sophisticated approach to farming is becoming increasingly important as farmers seek greater efficiencies to improve profits. It is also important on a global scale as farmers need to get a better yield from agricultural inputs to meet the demands of an expanding world population.

m-u-t's technology is used in environmental and processing plants to measure the amount of phosphates and nitrates in sewage effluent to ensure that it is compliant with environmental regulations. This information may be stored for documentation purposes as well as being fed back into the control system regulating the processing of the effluent. The technology is also deployed to measure the calorific value of waste material, fresh wood or sewage sludge used in waste-to-energy plants so that operators can pay suppliers according to the energy content of the material rather than the tonnage. It is used to monitor the moisture content when drying sewage sludge or other organic materials, thus optimising the energy used. m-u-t's spectrometric systems are also used to sort vegetables and fruit.

## **Strategy**

Over the last three years management has transformed the company into one delivering sustainable profitable growth. Management instigated a range of programmes to focus the business on the provision of a full-service offer for OEMs that generated profits: automating more production processes at Avantes; strengthening tec5's digitalisation capability; upgrading the salesforce; discontinuing unprofitable product lines; changing the management at m-u-t GmbH; and renegotiating supplier contracts. As part of this transformation, in November 2015 management sold its loss-making "direct-to-customer" laboratory automation business to Sarstedt Group.

Looking forward, management expects to achieve steady sales and earnings growth in the medium term. It intends to deliver this through a combination of organic growth, especially in the clean tech segment, and acquisition, thereby broadening the product portfolio and deriving further benefit from vertical integration.

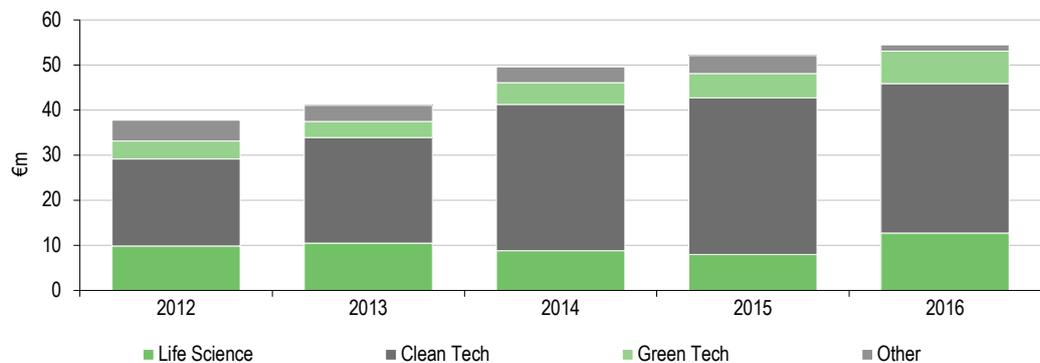
## Recent newsflow

FY17 has started well with a strong performance during Q117. The preliminary results for the quarter show a 17% year-on-year increase in sales to €16.4m and a 38% rise in EBIT to €2.9m. EBIT margin has improved from 15% to 18%, highlighting the successful implementation of the company strategy. At the end of May, management noted that performance so far had exceeded internal targets, but decided not to increase guidance of €7.3m EBIT for the full year and a slight increase in group sales at that point.

## Market overview

The group has no direct competitors as no single company has the same breadth of portfolio. B&W Tek, Zeiss Spectroscopy and Ocean Optics, which is part of Halma, and some small market entrants in China offer similar spectroscopy instruments to Avantes. Polytec offers spectroscopy systems that compete with tec5. While ABB offers complete system solutions, these are typically not customised and designed for deployment in areas where m-u-t is not active. As noted previously, m-u-t's products are used for such a diverse range of applications that changes in any demand from any single market sector have relatively little effect on performance overall. For example, historically m-u-t was involved in the printing industry. As this has fallen into decline, demand from the semiconductor manufacturing industry has supplanted it. m-u-t's ability to develop customised solutions means that it is continually introducing novel applications, most recently systems for use in smart farming (this falls into the green tech segment, which has been the largest growth driver in recent years), Industry 4.0 methodologies and point-of-care medical diagnostics (life sciences). These market segments are growing rapidly, but since m-u-t continues to supply many other segments, its overall revenue growth trajectory is relatively subdued by comparison.

**Exhibit 4: Revenue by segment progression**



Source: Edison Investment Research

## Management, organisation and corporate governance

German listed companies typically have three corporate bodies – an annual general meeting of shareholders, a board of management (Vorstand) and a supervisory board (Aufsichtsrat). There is clear separation between management and supervisory functions in the two-tier board. The purpose of the supervisory board is to support the interests of shareholders, but also the interests of other parties including the company's employees, and public interest. The supervisory board oversees the company's board of management and appoints its members.

## Supervisory board

**Chairman: Hans Wörmcke**

Mr Wörmcke founded m-u-t in June 1995 together with Sascha Otto. Mr Wörmcke is also joint managing director of Evac GmbH, which manufactures toilet cabins for trains.

## Management board

**CEO: Maik Müller**

Mr Müller became CEO of m-u-t AG and tec5 in May 2015, having previously been appointed as chairman of the board of directors at tec5 Inc in the US in 2012 and CEO of tec5 AG in October 2010, positions that he continues to hold. From 2009 to 2010 he was manager of the electronics and system engineering business unit at Zühlke Engineering. From 2005 to 2008 he was director of R&D and automation at CyBio AG, a leading provider of high-quality liquid handling and automation technologies used in life sciences. Between 1995 to 2005 he worked at tec5, initially as an electronics and software engineer, then as project manager and ultimately as manager of the systems business unit. He graduated in 1995, having studied electronics at the University for Applied Sciences Mannheim.

**CFO: Fabian Peters**

Mr Peters joined the management board of m-u-t AG in October 2013. Since January 2015 he has held the position of CEO of the subsidiary m-u-t GmbH as well as CFO of m-u-t AG. Prior to joining m-u-t AG, he worked for many years as CFO for an international medium-size production company. Before that he was a financial manager in the telecommunication and insurance field. He holds a degree in financial management.

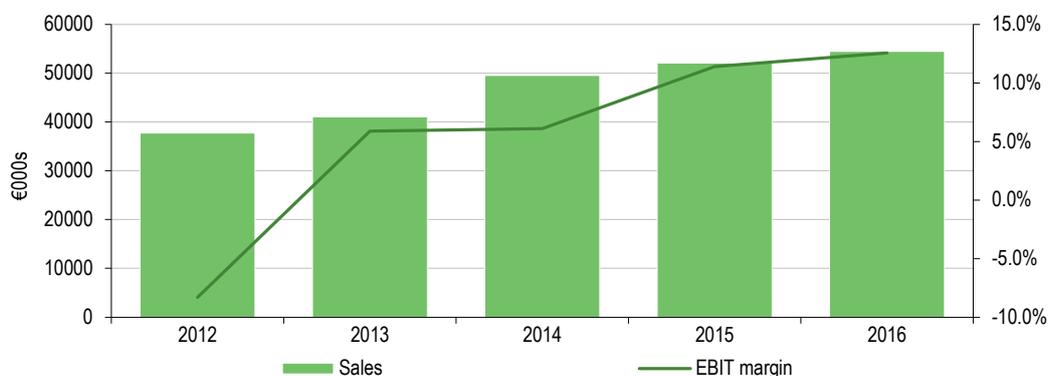
## Shareholders and free float

As at 15 July 2016, members of the supervisory and management boards held around 22% of the shares and institutional investors around 32%. The free float was around 46%.

## Financials

Over the last four years, management has instigated a programme of activities focusing the business on profitable work for OEMs and rationalising the cost base. This has resulted in a substantial improvement in EBIT margin (see Exhibit 5) and changed the group from one with high levels of gearing (net debt/net assets was 155% in FY12) to one with net cash (see Exhibit 7).

**Exhibit 5: Revenue and EBIT margin progression**



Source: Edison Investment Research

## Income statement

Group revenues rose by 5% (€2.4m) year-on-year to a record €54.5m in FY16. An estimated €0.5m of this growth was attributable to APOS, which was acquired in August 2016. This was driven by strong growth in revenues attributable to the life sciences segment (60% increase) and the green tech segment (34% increase) as the group focused on products and services for OEMs. Revenues from the clean tech segment fell by 5% year-on-year, reflecting weaker sales in the US following an unusually strong performance in FY15. Sales in America and Asia reduced by 11% and 14% respectively. There has been no material change in the competitive environment or sales channels underlying this reduction, which management regards as within the typical fluctuations in demand for the group's products. This reduction was more than offset by gains in revenues in Germany and the rest of Europe. The order book at the end of FY16 totalled €31.0m compared with €27.2m at the end of FY15. An estimated €0.1m of this was attributable to APOS, which is still in start-up mode.

### Exhibit 6: Financial summary

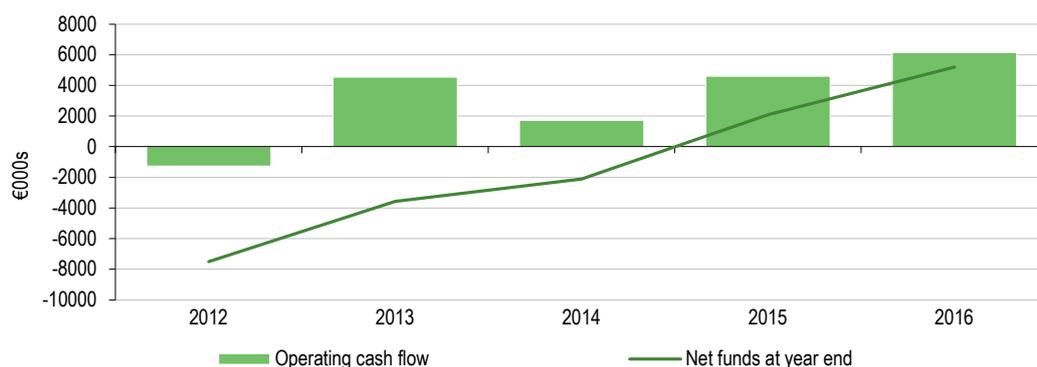
	€'000s	2014	2015	2016	2017e	2018e
Year end 31 December		HGB	HGB	BIIRUG		
<b>Income Statement</b>						
<b>Revenue</b>		<b>49,535</b>	<b>52,068</b>	<b>54,461</b>	<b>55,500</b>	<b>57,000</b>
EBIT		3,025	5,934	6,842	7,400	7,500
EBIT margin		6.1%	11.4%	12.6%	13.3%	13.2%
Profit Before Tax (as reported)		2,520	5,544	6,539	6,700	6,800
<b>Net income excluding minority interests (as reported)</b>		<b>1,123</b>	<b>3,045</b>	<b>3,658</b>	<b>3,900</b>	<b>4,000</b>
EPS excluding minority interests (as reported) – (€)		0.23	0.64	0.76	0.82	0.83
Dividend per share (€)		0.0	0.0	0.0	0.0	0.0
<b>Balance Sheet</b>						
Total non-current assets		4,868	4,665	5,439	-	-
Total current assets		19,275	21,576	23,262	-	-
<b>Total assets</b>		<b>24,143</b>	<b>26,241</b>	<b>28,701</b>	-	-
<b>Total liabilities</b>		<b>(17,364)</b>	<b>(15,317)</b>	<b>(15,055)</b>	-	-
Net Assets		6,779	10,924	13,645	-	-
<b>Shareholder equity</b>		<b>6,779</b>	<b>10,924</b>	<b>13,645</b>	-	-
<b>Net cash/(debt)</b>		<b>(2,098)</b>	<b>2,082</b>	<b>5,204</b>	<b>4,230</b>	<b>9,600</b>
<b>Cash flow</b>						
Net cash from operating activities		1,717	4,605	6,138	-	-
Net cash from investing activities		(747)	478	(1,807)	-	-
Net Cash from financing activities		(2,187)	(4,030)	(2,339)	-	-
<b>Net Cash Flow</b>		<b>(1,217)</b>	<b>1,053</b>	<b>1,992</b>	-	-
<b>Cash &amp; cash equivalent end of year</b>		<b>6,446</b>	<b>7,946</b>	<b>10,374</b>	-	-

Source: Company accounts

Cost of materials as a proportion of sales increased by 2.6pp to 44.9% in FY16 because of a higher proportion of third-party components incorporated into systems and a lower proportion of service revenues. Personnel costs increased by 3% year-on-year. The number of full-time employees fell from 249 to 241 as a result of the sale of the laboratory equipment business at the end of 2015 and the closure of m-u-t America during 2016, partly balanced by the APOS acquisition. This was offset by higher wage rates and variable salary elements. Other operating expenses decreased by 15% (€1.2m), partly as a direct result of management's cost control programme, partly because the higher level of sales in the US during 2015 had caused a jump in warranty provisions. EBIT rose by 15% to a record €6.8m and EBIT margin by 1.2pp to 12.6%. EPS (excluding non-controlling interests) grew more quickly than profit after tax (19% vs 2%), reflecting the increased stake in tec5 and Avantes.

## Balance sheet and cash flow

The group was highly cash generative during the year. After investing €1.8m in intangible and tangible assets (replacing operating and office equipment) and acquiring a majority stake in APOS and increasing the equity stake in tec5 and Avantes, net cash increased by €3.1m to €5.2m. Net assets increased by €2.7m to €13.6m.

**Exhibit 7: Cash flow dynamics**


Source: Edison Investment Research

## Valuation

### Peer valuation

The shares have performed well over the last 15 months, rising from around €3.30 in March 2016 to peak at €17.60 in early June. A comparison of m-u-t's prospective EV/Sales, EV/EBITDA and P/E multiples with those in our sample of European listed companies involved in instrumentation shows m-u-t trading at a discount to the sample mean on all metrics. We note that m-u-t remains towards the lower end of the sample range regarding EBIT margin and consensus estimates show it growing more slowly than most of the other companies in the sample.

**Exhibit 8: Listed peers**

Company	Market cap (€m)	Current EV/Sales (x)	Next EV/Sales (x)	Current EV/EBITDA (x)	Next EV/EBITDA (x)	Current P/E (x)	Next P/E (x)	Current EBIT Margin (%)	Sales CAGR (%)
Halma PLC	5,092	4.6	4.3	18.6	17.5	27.1	25.5	21.4	5.8
Isra Vision AG	721	5.2	4.7	17.4	15.6	35.9	31.4	20.7	10.9
Jenoptik AG	1,405	1.9	1.8	13.1	12.2	22.8	20.9	10.3	7.1
Oxford Instruments PLC	701	2.2	2.1	13.4	12.8	20.0	18.6	13.8	0.3
Spectris PLC	3,631	2.3	2.2	13.8	12.6	19.6	17.6	14.4	6.1
Vaisala OYJ	665	1.8	1.7	11.7	9.7	26.5	21.1	11.6	5.4
Viscom AG	192	2.2	2.1	13.9	12.5	24.1	21.9	13.9	9.0
<b>Mean</b>		<b>2.9</b>	<b>2.7</b>	<b>14.5</b>	<b>13.3</b>	<b>25.1</b>	<b>22.4</b>	<b>15.2</b>	<b>6.4</b>
m-u-t AG	71	1.2	1.2	7.2	7.1	18.2	17.9	13.3	2.3

Source: Bloomberg. Note: Prices at 13 June 2017.

## Sensitivities

- Financial:** where possible, currency risks are limited by billing in euros. Management also addresses the risk of currency shifts by using simple derivative financial instruments (swaps and forward transactions). The risk associated with movement in interest rates, which is less significant now than four years ago, is addressed through the use of fixed interest rates.
- Legislation:** new regulations tend to be beneficial to m-u-t if they have an impact, as regulations such as the EU Nitrates Directive, which will enter into force in the second half of 2017, typically require monitoring equipment, which may deploy m-u-t technology, thus creating an opportunity.
- Customer/industry exposure:** as discussed above, m-u-t's technology is deployed over a very broad range of industries, so it is not reliant on the performance of a single sector. Similarly, m-u-t is not reliant on any individual customers.

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