

<b>Buy</b>  <b>EUR 21.00</b> (EUR 16.50)  Price <b>EUR 15.90</b> <b>Upside 32.1 %</b>	<b>Value Indicators:</b> EUR DCF: 21.00 FCF-Value Potential 19e: 16.00 Peer group 19e: 21.00	<b>Share data:</b> Bloomberg: SMHN GR Reuters: SMHNN ISIN: DE000A1K0235	<b>Description:</b> Leading solution provider for niche markets advanced packaging, 3D integration, LED, MEMS
	<b>Market Snapshot:</b> EUR m Market cap: 303.7 No. of shares (m): 19.1 EV: 270.0 Freefloat MC: 303.7 Ø Trad. Vol. (30d): 1.43 m	<b>Shareholders:</b> Freefloat 100.0 % <i>Universal Investment</i> 5.0 % <i>Henderson Global</i> 5.0 % <i>Sycamore</i> 4.7 % <i>Lupus Alpha</i> 3.2 %	<b>Risk Profile (WRe):</b> 2017e Beta: 1.3 Price / Book: 2.2 x Equity Ratio: 70 %

## 80% earnings growth expected by 2020; PT up to EUR 21

**2017 marks an inflection point for SÜSS as projection scanners and temporary bonders**, both somewhat problematic projects, **are on the brink of market adoption**. These products should contribute to significant top-line growth, which we are estimating at >10% 2017-2020e. Thanks to positive operating leverage effects, the EBIT margin should increase to 15%, which implies an EBIT CAGR of 23%. In light of these promising prospects, the **PT is raised to EUR 21**, which represents further valuation upside of >30%.

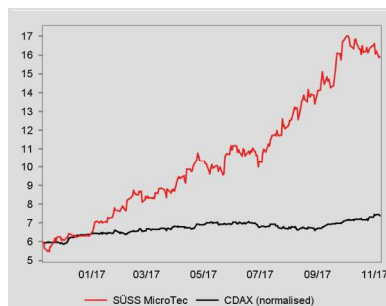
Profitability has been burdened by high losses for projects that initially failed over the past 10 years and overshadowed the underlying strong profitability in the core business (15-20% EBIT margins in the largest segment lithography). While SÜSS posted an average EBIT margin of <6% in 2010-2016, this should clearly change as anticipated sales growth should trigger a strong rise in margins, which will also turn the FCF profile positive. The new **WR 2019 EBIT forecast is ~30% above the latest consensus expectation**.

We are strongly **assuming that sales of EUR 240m will become reality by 2020** as new products contribute sales of >EUR 60m, up from basically zero in 2017:

- **Continued high demand for core lithography products** (mask aligners + coaters) is based on an increase in capacity additions in the target market of advanced packaging, which implies rising demand for production systems. The environment for MEMS is also buoyant with rapid expansion in the use of sensors etc. (e.g. IoT, autonomous cars, smartphones). SÜSS should remain the #1 player for lithography equipment in these applications.
- The company made a bold bet on **temporary bonding** in ~2010 (the Samsung 3D IC case) but so far, this has not come to fruition. **2017 clearly marks an inflection point**, as SÜSS has scored orders for three tools. Stacked memory is increasingly being used in servers (big data analysis) and elsewhere (e.g. high-end graphic cards, artificial intelligence, high-end computing). Further investment by Samsung and other memory players should represent a **EUR 70m sales opportunity in the 2017-20e period** (mostly for DRAM). Additional sales potential could arise if the technology also enters the NAND memory market (e.g. for SSDs). Toshiba presented a TSV-based chip in July.
- With the takeover of Tamarack in 2012, SÜSS acquired **scanner technology** with the aim of extending its product portfolio and to rival its main lithography (exposure) competitor Ultratech (acquired by Veeco in 2017). Higher throughput of the tools made it especially attractive for volume applications, which led to a **major order from TSMC in 2015**. As it turned out, the tools did not meet the required specifications (for certain applications). The **technical issues have meanwhile been resolved** and the customer response has been positive. This **unique technology with lower costs of ownership** offers a sales opportunity of **EUR 30-50m p.a.**, as SÜSS should gain significant market share.

Additionally, **new generation permanent bonders** (for MEMS) should represent a EUR 20m p.a. sales opportunity by 2020.

**News-flow should stay strong** with healthy demand in the core lithography business (strong Q4 orders expected) and order intake that shows the expected uptake of the new technologies (temporary + permanent bonding, projection scanners). We are thus reiterating **the Buy rating with a PT of EUR 21** (based on DCF) which is supported by peers' valuation of ~12x EBITDA 2019.

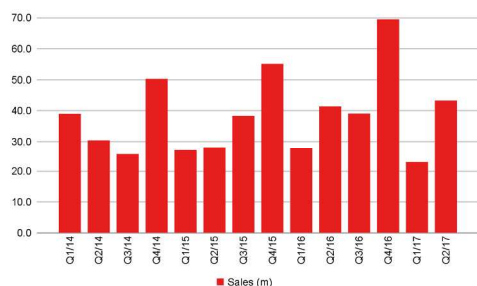


Rel. Performance vs CDAX:	
1 month:	-6.9 %
6 months:	59.5 %
Year to date:	132.6 %
Trailing 12 months:	139.1 %

**Company events:**  
09.11.17 Q3

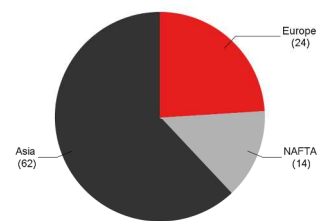
FY End: 31.12. in EUR m	CAGR (16-19e)	2013	2014	2015	2016	2017e	2018e	2019e
<b>Sales</b>	6.6 %	134.5	145.3	148.5	177.6	180.0	195.0	215.0
Change Sales yoy		-17.9 %	8.0 %	2.2 %	19.6 %	1.4 %	8.3 %	10.3 %
Gross profit margin		16.2 %	33.6 %	33.2 %	33.0 %	37.1 %	37.0 %	37.3 %
<b>EBITDA</b>	31.0 %	-13.4	12.6	9.2	15.3	23.7	27.3	34.4
Margin		-10.0 %	8.7 %	6.2 %	8.6 %	13.2 %	14.0 %	16.0 %
<b>EBIT</b>	40.0 %	-19.4	8.4	5.0	11.1	19.7	23.5	30.6
Margin		-14.4 %	5.8 %	3.3 %	6.3 %	10.9 %	12.1 %	14.2 %
<b>Net income</b>	62.0 %	-16.0	4.6	0.2	5.0	11.5	15.3	21.3
<b>EPS</b>	62.2 %	-0.84	0.24	0.01	0.26	0.60	0.80	1.11
<b>EPS adj.</b>	42.9 %	-0.27	0.24	0.01	0.38	0.60	0.80	1.11
<b>DPS</b>	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dividend Yield		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>FCF / Market cap</b>		0.21	0.11	0.07	-0.47	0.39	0.74	0.72
		2.7 %	1.7 %	1.1 %	-6.5 %	2.4 %	4.7 %	4.5 %
<b>EV / Sales</b>		0.9 x	0.6 x	0.5 x	0.6 x	1.5 x	1.3 x	1.1 x
<b>EV / EBITDA</b>		n.a.	7.2 x	8.5 x	7.4 x	11.4 x	9.4 x	7.0 x
<b>EV / EBIT</b>		n.a.	10.9 x	15.7 x	10.2 x	13.7 x	10.9 x	7.9 x
<b>P / E</b>		n.a.	27.2 x	590.6 x	28.1 x	26.5 x	19.9 x	14.3 x
<b>P / E adj.</b>		n.a.	27.2 x	590.6 x	19.2 x	26.5 x	19.9 x	14.3 x
<b>FCF Potential Yield</b>		1.0 %	7.1 %	3.2 %	9.4 %	4.1 %	5.7 %	8.4 %
<b>Net Debt</b>		-31.8	-33.3	-34.8	-26.3	-33.7	-47.8	-61.6
<b>ROCE (NOPAT)</b>		n.a.	5.9 %	0.3 %	5.8 %	11.5 %	14.8 %	19.8 %
<b>Guidance:</b>		2017: Revenues EUR 170 - 180m, EBIT EUR 15-19m						

**Sales development**  
in EUR m



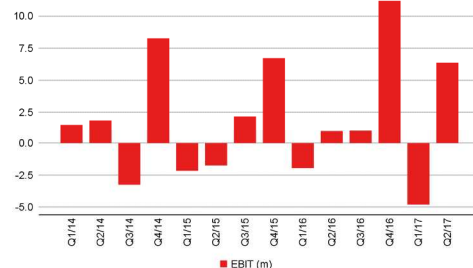
Source: Warburg Research

**Sales by regions**  
2016; in %



Source: Warburg Research

**EBIT development**  
in EUR m



Source: Warburg Research

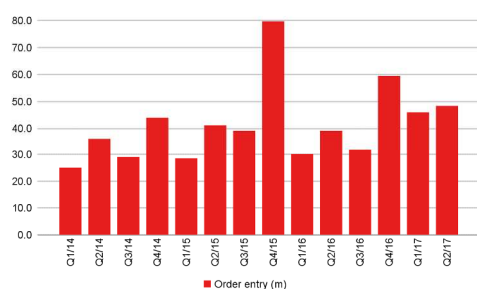
## Company Background

- Globally leading manufacturer of systems for the MEMS, advanced packaging, 3D integration and LED niche markets with the product segments lithography (mask aligner, coater), bonder and equipment to clean photomasks.
- MEMS integrate electronic and mechanical components. Fields of application are e.g. pressure sensors (e.g. in tyre pressure control systems) or position and acceleration sensors (e.g. smartphones, tablet PCs).
- Advanced packaging is a special packaging process used as an alternative to the classic wire bonding ("flip chip") for semiconductors where these are directly bonded to the substrate without wire connections.
- 3D packaging is a solution to the increasingly difficult ongoing structural downsizing of semiconductors. CMOS image sensors are an early field of application. This market offers enormous growth potential for SÜSS.
- The majority of production is located at two sites in Germany (Garching, Sternenfels) which offer ample capacity for anticipated growth. SÜSS has ca. 690 employees.

## Competitive Quality

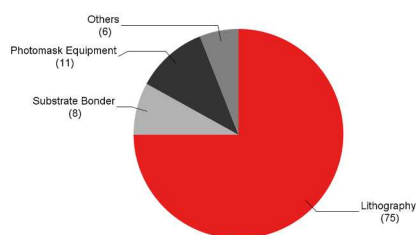
- SÜSS consistently focuses on the core topics (precision, reliability and low total cost of ownership) in all segments and gears the products to the customers' needs.
- The 60-year company history and the consistently high product quality have firmly established SÜSS as a brand-name in the addressed markets.
- This and the global service network make the company a preferred supplier for production equipment in particular.
- As the respective markets have a niche character, SÜSS usually only has to face moderate competition and rarely has to compete with the major suppliers of the sector.
- This combined with the high product complexity poses a major barrier to market entry and secures the company a leading position in the respective markets.

**Order development**  
in EUR m



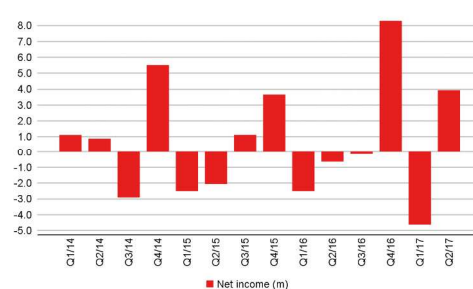
Source: Warburg Research

**Sales by segments**  
2016; in %



Source: Warburg Research

**Net income development**  
in EUR m



Source: Warburg Research

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## Summary of Investment Case

### Investment triggers

- In its existing product portfolio, SÜSS should remain a global #1 player in niche equipment markets for attractive and growing target markets (MEMS, sensors, advanced semiconductor packaging)
- SÜSS continues to benefit from increasing performance requirements and more demanding form factors in most of its target markets
- 2017 marks an inflection point for future growth drivers, temporary bonding and projection scanners as...
- ...SÜSS has received three orders for temporary bond tools since the beginning of the year. 3D stacking is an emerging technology in memory devices, which should lead to rising equipment demand in future. SÜSS should take a dominant market position here
- ...the new CEO Franz Richter successfully managed to resolve the technical issues with projection scanners, which should now gain market share from competing stepper products in growth applications such as FO-WLP as a result of clearly lower costs of ownership

### Valuation

- The PT of EUR 21 is based on an updated DCF model, which now incorporates 15% EBIT margin from 2020 onwards on the back of strong top-line development expectations
- A peer-group comparison supports the PT based on 2019 EBIT/EBITDA multiples
- In a takeover scenario, SÜSS might be valued at EUR 25–30 per share based on the multiples of Veeco's acquisition of direct peer Ultratech

### Growth

- At group level, revenue CAGR is expected to reach ~10% in the 2017-20 timeframe to sales of EUR 240m driven by
- ...a surge in substrate bonder sales from EUR 14m in 2016 to >EUR 55m by 2020 thanks to market share gains in permanent bonding and the emerging demand for temporary bonders
- A rise in Tamarack's (now SÜSS Photonics; projection scanners + laser tools) sales contributions to ~EUR 30m by 2020
- In a more positive scenario, group sales might increase by >15% p.a. to EUR 280m by 2020
- Thanks to strong top-line growth, the EBIT margin should reach 15% by 2020, implying an EBIT 2017-20 CAGR of ~23%

### Competitive quality

- SÜSS targets niche markets in the semiconductor equipment space, where a few vendors typically hold dominant market positions
- Thanks to the relatively small size of the market, SÜSS avoids competition from the semiconductor equipment heavyweights
- In temporary bonding, SÜSS is the only remaining equipment supplier shipping into volume applications, which should have extended the technological lead and should result in a high market share
- The new scanner technology comes with far better costs of ownership than incumbent steppers, which should enable SÜSS to gain market share. New features and customer demand for a second source should lead to market share gains in permanent bonders as well

### Warburg versus consensus

- The new WR estimates are 14% and 32% above the latest EBIT consensus forecast for 2018 and 2019 respectively

## Company Overview

Segments	Lithography	Bonder	Photomask & Other
<b>Sales in EUR m</b>	122,5	23,0	34,5
<i>in % of total</i>	68,1%	12,8%	19,2%
<b>EBIT in EUR m</b>	13,4	3,0	3,3
<i>margin</i>	10,9%	13,0%	9,5%

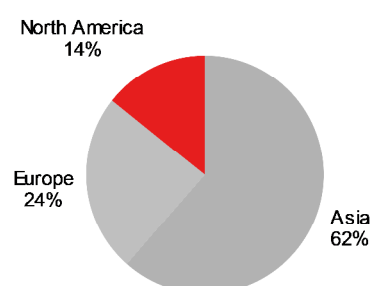
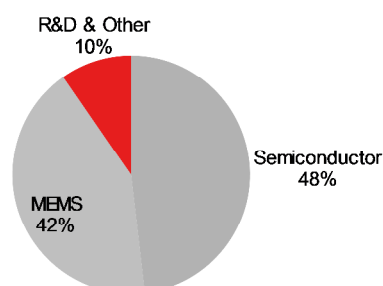
### Products



Applications	Lithography tools for Advanced Packaging, MEMS (Sensors etc.), LED	Substrate Bonder for 3D IC, MEMS, Advanced Packaging	Photomask cleaning equipment for semiconductor front end; microoptics
Market positions (market share)	Market leader in mask aligners + coaters (30-50% share); challenger in scanner systems (pot. 40-50%)	#1 in temporary bonders; (90%) #2 for permanent bond systems (10-20% so far)	Global #1 in photomask cleaning (85% ms)
Competitors	Ultratech, Tokyo Electron, EVG, Ushio, Rudolph Tech.	EVG, Tokyo Electron, TOK	Sigmameltec

Customers	Bosch, Infineon, Amkor, TSMC, Epcos, ASE, STM & others	SAMSUNG, Bosch & others	Intel, TSMC, SAMSUNG & others
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### End market / region split



\* All numbers relate to WRe 2017;

Source: Warburg Research

## Investment Case

- EBIT margin should rise to 15% by 2020 after grim years with an average EBIT margin of <6% in the 2010-16 period
- 2017 marks an inflection point for BOTH future growth drivers: temporary bonding, where 3D ICs are gradually emerging and equipment demand is taking off; and projection scanners, where SÜSS has resolved the technical issues which should lead to significant market share gains

### 2017 marks inflection point

**Shareholders have had a tough ride in the recent years**, as the company did not live up to expectations and recorded more than one setback in promising strategic areas, which have yet to come to fruition. The **underlying traditional strength in its core lithography business was overshadowed** by significant losses elsewhere.

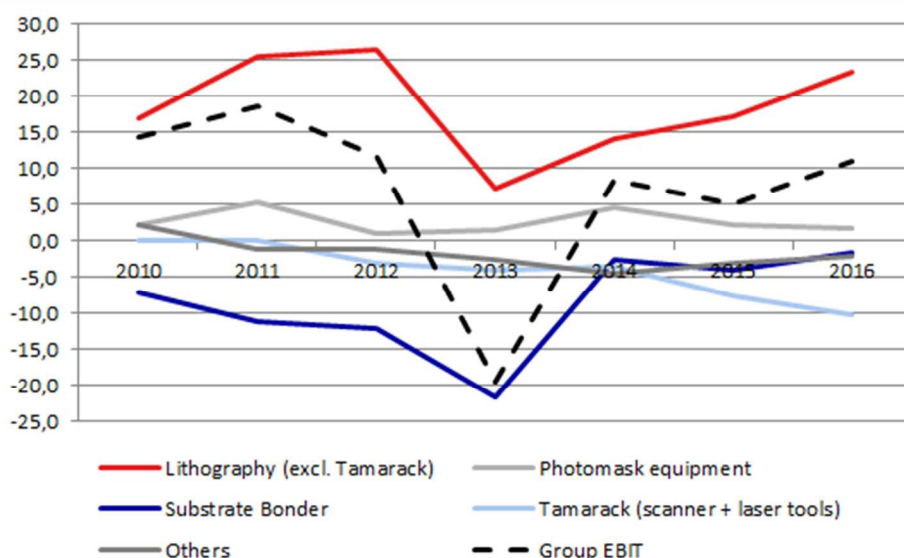
We think that the **tide has turned and that 2017 marks an inflection point**. The core business is back to its former strength and more importantly, **visibility is increasing that SÜSS is offering key products for strongly growing segments** in its target markets. We see a **EUR 240-280m sales and > EUR 30m EBIT opportunity in 2020**, which is not adequately reflected at today's share price levels.

## Profitability

The following chart reflects the composition of EBIT in recent years. It not only shows the **usually high profitability of the core business**, but also that SÜSS was **suffering from a remarkably poor performance in other business segments**, characterised by high costs for the development / introduction of new products, which have not yet come to fruition. This, however, is about to change. It was 2011, when the group EBIT margin last reached a level of >10%, despite an average EBIT margin of 18% in its largest (60-65% of sales) and most profitable segment lithography.

### High profitability in core business overshadowed in recent years

EBIT development 2010-16



Source: Warburg Research

To assess the future opportunities, we will focus on the two segments substrate bonders and scanners, which were mostly responsible for the weak operating performance of recent years.

### Competitive quality

SÜSS's various target markets have one thing in common: they represent market niches with a market volume of between EUR 30m and EUR 150m p.a. The relatively **small size of the markets wards off competition from the big semiconductor equipment heavyweights**. Based on technical strengths, it is **not uncommon that one or two players achieve dominant market positions**, with an individual market share of 50% or more.

As a result, **SÜSS holds a #1 market position in its established products mask aligners, coaters and photomask equipment and is expected to capture market share and to become a #2 player in the promising areas of substrate bonders and scanners / steppers**.

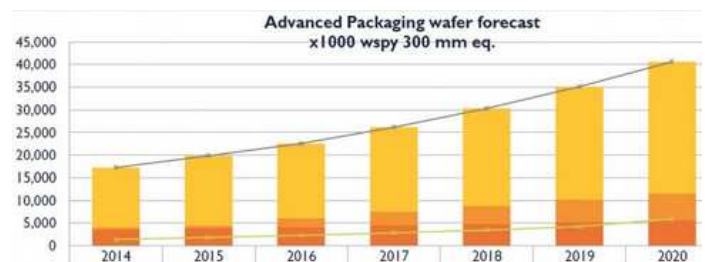
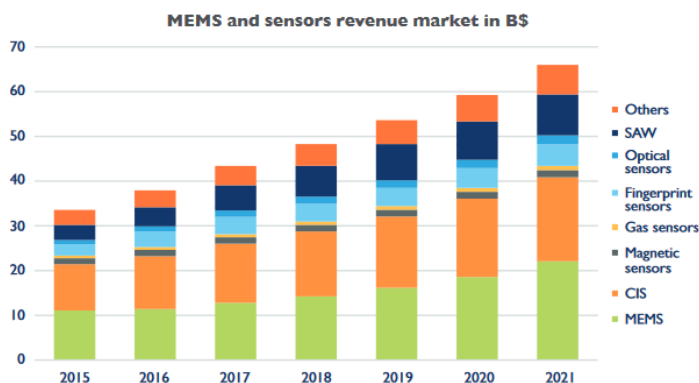
### Bouyant target markets until 2020

As an equipment supplier, SÜSS depends on capacity additions in its target markets, thanks to the increasing use of MEMS for sensors in many existent (e.g. smartphones) and new applications (e.g. AR/VR). The trend towards smaller form factors coupled with increasing performance continues to bode well for more advanced technologies in semiconductor packaging.

As a result, the market environment should remain **buoyant for Süss until 2020 and beyond**.

### Healthy environment at least until 2020

### Growing end-markets



Source: IHS, VLSI, Yole, Warburg Research

## Substrate Bonder

### Substrate Bonder

Substrate (or wafer) bonders are used to create a stable and hermetically sealed encapsulation or "bond" (permanently or temporarily) between one or more wafers. The technology is used to produce MEMS (Micro Electro Mechanical System such as e.g. pressure sensors, GPS sensors) and is a key enabler for 3D or stacked ICs such as memory cubes.

Source: Warburg Research

Substrate Bonders are a niche market with a global market volume of roughly USD 150-200m. While SÜSS treated this market shabbily in the early 2000s, Austrian competitor



EVG focused on this market and became the undisputed market leader to date (market share estimate ~60-70%). Sub-segments of the markets are permanent and temporary bonders. SÜSS should become a relevant player in BOTH areas thanks to its technological leadership in temporary bonding and market share gains in permanent bonding, which will drive future sales growth.

### Permanent Bonders – market share gains expected

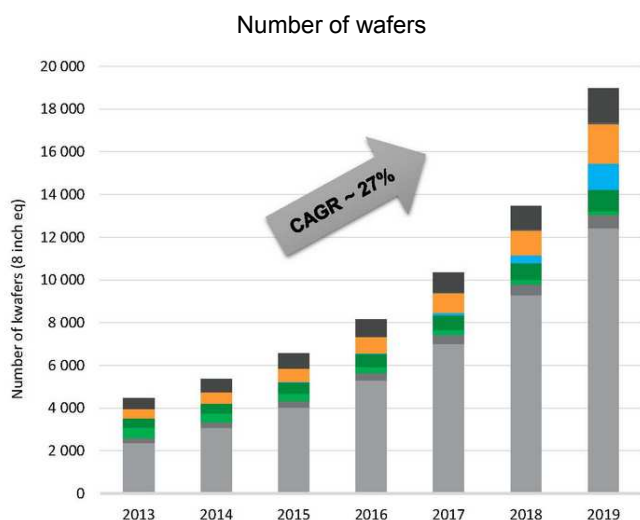
SÜSS suffered a major setback in this area, as it turned out that its permanent bond cluster platform was not optimally designed and its focus was wrong. The company decided to shut down the bond cluster business in 2013, but kept the manual systems business.

SÜSS made a new attempt and introduced its new XB8 manual tool in Q3 2015, which triggered a rise in order intake from mid-2016 onwards. Its automated XBS200 bond-platform was introduced only recently in Q1 2017. These systems re-use the existing coater-platform which provides for high reliability and enables short time-to-market. The system offers some technical advantages, which should be attractive for customers in some applications. Initial customer feedback has been positive, according to SÜSS, and the company might announce its first order entry before the end of this year.

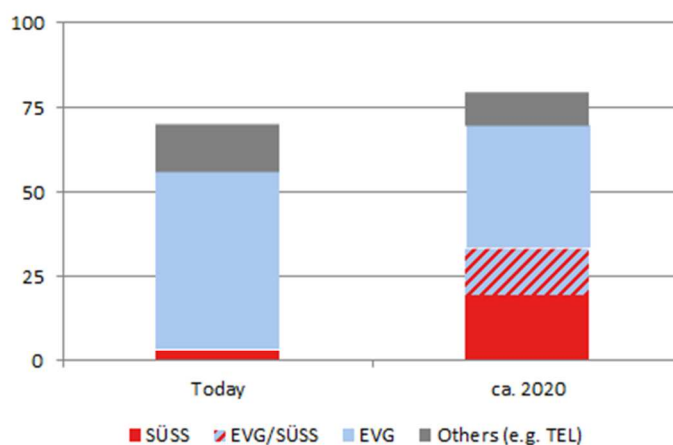
The market volume for automated permanent bonders is expected to increase only marginally in the coming years. However, SÜSS should benefit from market share gains, as we assume that SÜSS should be able to take a 25-40% share in the market with EVG remaining the largest player. This would imply a EUR 20-35m sales opportunity.

#### Share gains in permanent bonding expected

### Market permanent wafer bonders



### Market permanent wafer bonders



Source: Yole; Warburg Research

### Temporary Bonders



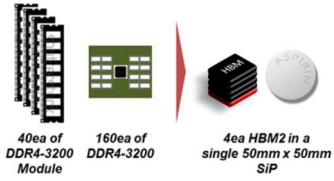



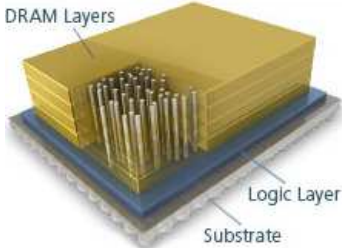

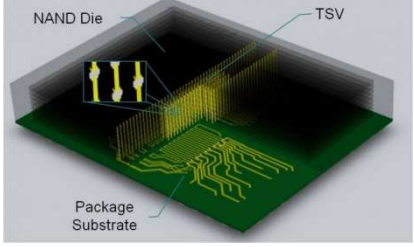

The growth potential of temporary bonders was a key element of the investment case in the 2010–2013 period, but this dissipated in more recent years as it became clear that initial expectations were too high and market adoption was taking longer than expected (or was perceived not to have happened at all). One reason was that the technology failed to penetrate the expected early high volume application (smartphone application processor with memory). On the flip side of the coin, the delay and smaller market volume led to the withdrawal of competitors and **SÜSS is the only remaining supplier shipping products for volume applications.**

**2017 marks the inflection point for this technology** in our view, as reflected in orders for three temporary bonding tools since the beginning of the year. This is underpinned by news-flow from memory IDMs (see next page).

#### Temporary bonders eventually to be adopted for 3D ICs



## 3D DRAM applications

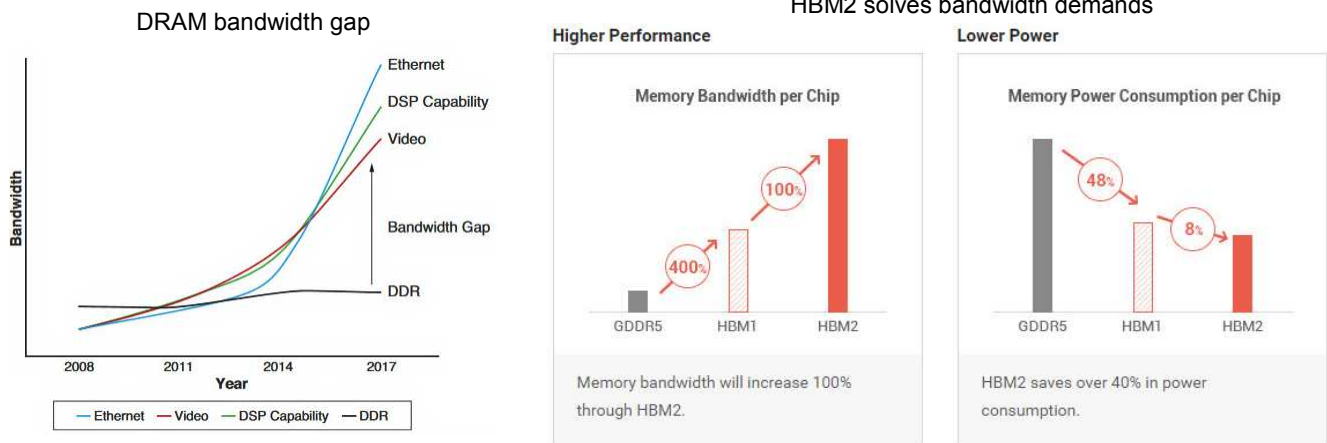
Supplier	Product	Application
<ul style="list-style-type: none"> <li>▪ <b>Samsung and SK Hynix began production</b> of high capacity (64GB + 128GB) TSV based <b>DDR4 DRAM modules</b> in 2015 (with volumes now rising).</li> </ul>		
<ul style="list-style-type: none"> <li>▪ <b>Samsung started production</b> of its 2<sup>nd</sup> generation high bandwidth memory <b>HBM2</b> in 2016,...</li> <li>▪ ...<b>announced the development of a low-cost HBM chip</b> for consumer applications in 2016 and...</li> <li>▪ ...<b>announced the doubling of its production capacity</b> of its 2<sup>nd</sup> generation high-bandwidth platform (<b>HBM2</b>) in July 2017</li> <li>▪ <b>SK Hynix will start production</b> of <b>HBM2</b> memory close to the end of 2017</li> </ul>	 	 
<ul style="list-style-type: none"> <li>▪ <b>Intel adopted Micron's</b> high bandwidth memory <b>HMC</b> (competing to HBM) for its latest high-end processor platform in 2016</li> </ul>		
<ul style="list-style-type: none"> <li>▪ <b>Toshiba introduced TSV based 3D NAND chips</b> in August 2017</li> </ul>		

Source: Intel, Nvidia, SK Hynix, Samsung, Toshiba, Warburg Research

**3D memory ICs** are among the first users of stacked IC / TSV technologies. Average DRAM content in servers continues to increase which is served by SAMSUNG SK Hynix with TSV-based higher density DDR4 modules (64 + 128 GB). Stacking in particular

facilitates products with high bandwidth, better energy efficiency and a small form factor. Higher-end applications in servers (incl. networking, performance computing, AI etc.) or graphic chips (enthusiast gaming products, AR/V but also high performance computing) suffer from a problem known as the “memory wall”, as DRAM memory performance increases are clearly lacking application-driven bandwidth requirements (and rise in CPU performance). High bandwidth memory solutions (such as HBM2 or HMC) solve these issues (see following charts). Toshiba only recently announced a TSV-based NAND storage solution.

## High bandwidth memory

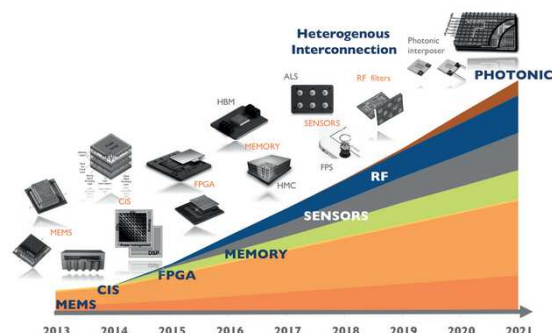


Source: SAMSUNG, Xilinx, Warburg Research

Another target market is **CMOS image sensors (CIS)**, which became the standard (by replacing CCD sensors) in smartphone cameras and other imaging applications. CIS already incorporate TSV technology but, for the most part, do not require a temporary bonding step. With higher demands e.g. for 3D imaging/sensing, temporary bonding steps are increasingly required by new bonding technologies (“hybrid bonding”).

Beyond memory and CIS, TSV based chip stacking is expected to be used in **further applications** that should gradually lead to rising demand (see chart). The other “hot” topic in advanced packaging is the so-called fan-out wafer level packaging (FO-WLP), which is already in mass production at TSMC for Apple’s A10 chip, which powers the iPhone. According to the technology roadmap, future production of fan-out devices is expected to be partially based on carrier wafers as well (due to warpage-problems of thin wafers). This would create a EUR >25m equipment market for temporary de-bonders in the medium term.

## Broadening TSV-based 3D landscape



Source: Yole, Warburg Research

The **production of most TSV-based 3D devices incorporates three indispensable bonding steps**. First, a thinned wafer is temporarily bonded to a carrier wafer. Second, after processing, the thinned wafer is de-bonded (and cleaned from the glue) from the carrier wafer. These steps are carried out at wafer level and use the temporary bond/de-bond equipment from SÜSS. In theory, stacking can also be carried out at wafer level (e.g. based on a SÜSS permanent bonder). For yield issues, the individual dies are singulated and bonded by die-bonders. This may change in the future but probably not within the next 3-4 years. Thus, **two systems are required from SÜSS for the processing of each wafer**.

On the evidence of available products, we are considering 3D memory (DDR4/5 + HBM2/3 for graphic chips) and CIS technology as “very likely” applications that should fuel future demand for temporary bonders/de-bonders. Based on WR and market projections, we are **estimating annual equipment demand of ~8 systems until 2020 and beyond**. Based on SÜSS’s strong technical positioning in these applications (WRe: sole supplier to Samsung and potentially SK Hynix), SÜSS is expected to capture the largest part of this. Other applications represent additional upside. Announcements have already been made for applications such as NAND storage, a low cost HBM for low/mid end graphic chips and laser assisted de-bonding in FOWLP. Visibility of potential market introduction remains lower though at the current stage. The total market potential is more than double the size of the “likely” scenario and amounts to 15-20 systems p.a. until 2025.

An adoption of TSV-based chip packages in smartphone is not reflected in the estimates, as there is no indication of an adoption until 2020. This would represent clear further upside owing to the high volumes.

**Emerging 3D applications should require ~8 bonders / de-bonder p.a.**

### Temporary Bonding market

Application	Potential # of wafers (in thousand p.a.)		Required bond /de-bond tools	
	2020	2025	2020	2025
CIS hybrid bonding	400	1.000	8	16
DRAM DDR4/5	1.000	2.900	20	46
DRAM Graphics (HBMx)	140	220	4	4
<b>"Likely" market potential</b>	<b>1.540</b>	<b>4.120</b>	<b>32</b>	<b>66</b>
DRAM low cost HBM	260	630	6	10
NAND	700	3.000	14	46
FOWLP (only laser de-bonding)	1.600	2.400	16	19
<b>Total market potential</b>	<b>4.100</b>	<b>10.150</b>	<b>68</b>	<b>141</b>
<b>Total equipment market opportunity '17-'25 (m USD)</b>				<b>ca.600m</b>
<b>Tool market</b>			<b>2017-20e</b>	<b>2021-25e</b>
<b>Average tool demand p.a. "likely"</b>			<b>8</b>	<b>7</b>
<b>Average tool demand p.a. total</b>			<b>17</b>	<b>15</b>

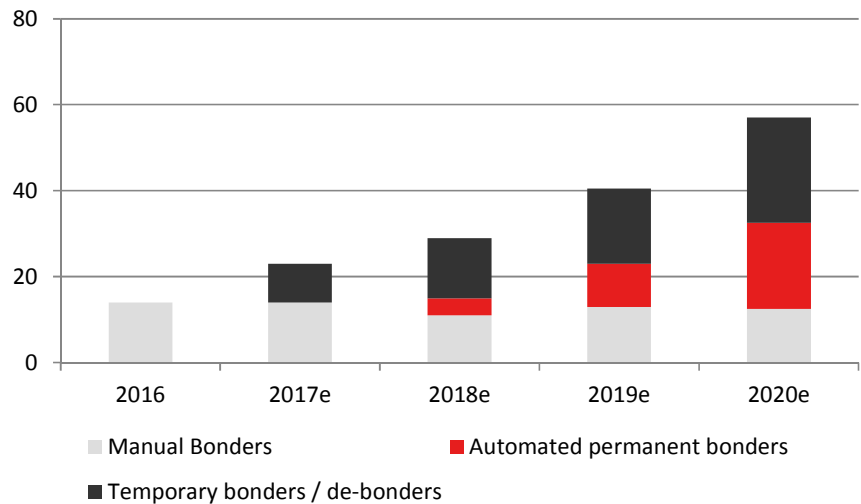
Source: IHS, Micron, Nanya, Yole, Warburg Research

**After some meagre years, temporary bonding is beginning to pick up and should yield an equipment market with a probable volume of EUR 25–30m for SÜSS**. In a more positive scenario, annual equipment demand might amount to ~EUR 60m p.a. well beyond 2020.

### Bonders to contribute > EUR 50m in sales by 2020

In a nutshell, market share gains in permanent bonding and a leading position in the temporary bonding market, which is finally emerging, should **boost sales in the bonder segment from EUR 14m in 2016 to > EUR 50m by 2020**.

### Bonder revenues



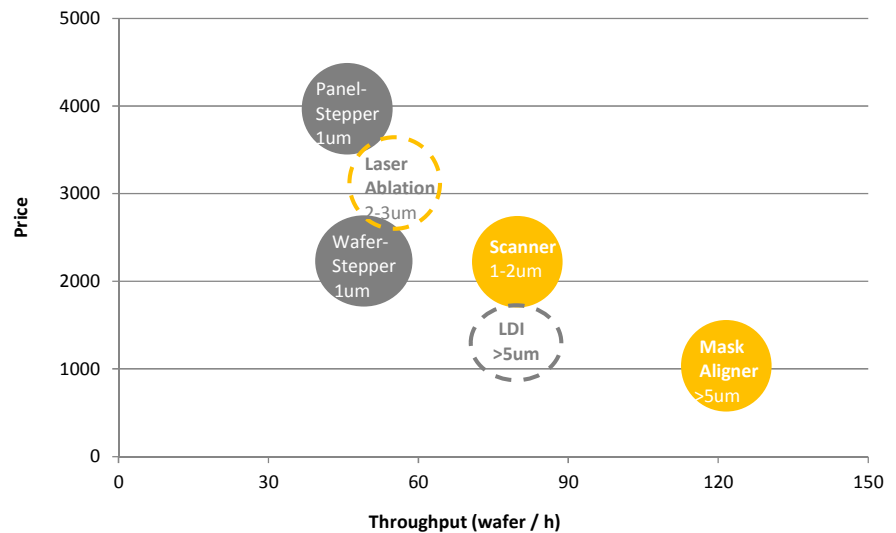
Source: Warburg Research

**New scanner generation represents  
EUR 25 – 50m p.a. opportunity**

### Projection scanner (Tamarack)

Another problematic area in the past years has been Tamarack, which was acquired (in 2012) and is now SÜSS Photonics Inc, based in Corona (US). The rationale of the deal was to extend the product portfolio exposure and to occupy the performance-gap between lower cost mask aligners (for resolutions of >5 micron) and high-cost steppers (for resolutions of 1-5 micron; see following chart). Laser ablation (also provided by SÜSS) and laser direct imaging (LDI) are still in the development stage for certain applications.

### Lithography tools



Source: SÜSS, Yole, Warburg Research

In 2015, SÜSS gained a milestone order, as a leading Asian foundry (WRe TSMC) ordered multiple systems. After the first tools went into production, it became clear that these were operating close to their technical limitations. As a result, a follow-up contract was lost to Ultratech.

SÜSS successfully resolved the technical challenges and will introduce a next generation system (H1 2018), after the less than optimal design of the first generation

(improvement of resolution + speed). Customer feedback has been positive, according to SÜSS.

As the **improved scanners occupy the sweet spot** of being good enough for more advanced packaging applications, both today and in future, at a roughly similar price as incumbent systems, it appears **highly likely that other customers besides TSMC will adopt this technology as well based on clearly better costs of ownership**. It is estimated that the advanced packaging related lithography market for advanced tools (steppers + scanners excl. mask aligners) will reach approx. 40-60 tools by 2020. A 30-50% market share would represent a EUR 25-50m sales opportunity for SÜSS.

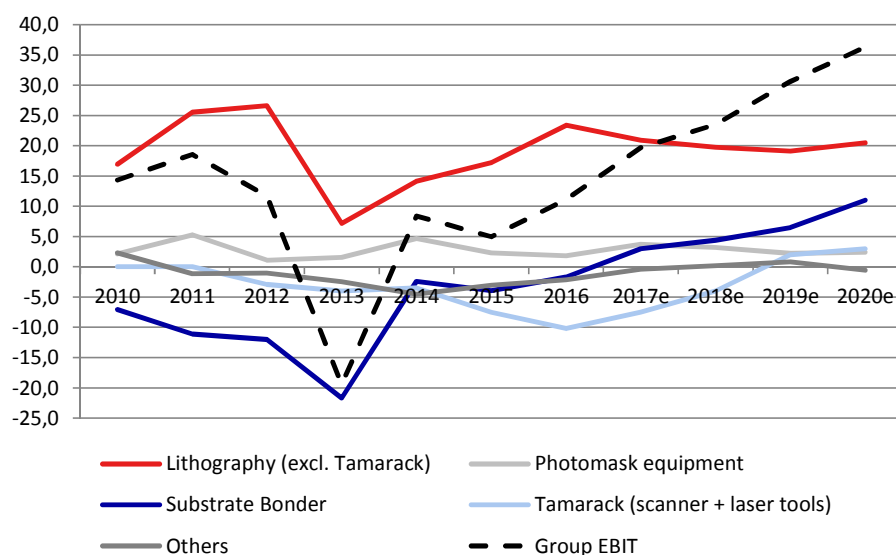
In addition to the projection scanners, SÜSS is offering laser steppers (based on ablation), which are expected to be adopted for future packaging applications at a later stage. The company already gained orders for R&D tools from leading US-based chip manufacturers.

## 15% EBIT by 2020

As a result of the promising 2020 prospects, the development of group EBIT should be significantly better than in the previous years and reach 15% of sales by 2020. Main drivers will be the achievement of clearly positive margins in the substrate bonder (dark blue, profitable from 2017 onwards) and projection scanner business (light blue, profitable from 2019 onwards), while stable development at a favourable level is expected for the core lithography division.

Expected sales growth should yield  
15% EBIT margins

### EBIT development 2010-20e



Source: Warburg Research

## Growth / Financials

- Sales should rise by 10% p.a. to EUR 240m by 2020 thanks to strong growth in substrate bonders and projection scanners
- A high case offers further potential of up to EUR 280m
- As a result of the strong sales growth, the EBIT margin should rise to 15% implying a 23% EBIT CAGR 2017-20e

Sales are expected to increase to EUR 240m by 2020

### The EUR 240-280m sales opportunity

The company has already indicated that it may reach sales of EUR 250m by 2020, which is ~ 40% above the 2016/17 figure. This potential is in line with our assumptions. Main drivers will be higher sales in the bonder and scanner segments. We **assume that sales will increase to EUR 240m by 2020 in a base case scenario with further upside to EUR 280m in a high case:**

#### Group sales

	2017e	2020 low case	2020 base case	2020 high case
Core Litho	119,5	105,0	<b>119,0</b>	125,0
Photomask Equipm.	23,0	18,0	<b>21,0</b>	25,0
Others	11,5	13,0	<b>15,0</b>	16,5
Substrate Bonder	23,0	46,0	<b>55,0</b>	70,0
Projection scanners / laser tools	3,0	25,0	<b>30,0</b>	45,0
<b>Group sales</b>	<b>180,0</b>	<b>207,0</b>	<b>240,0</b>	<b>281,5</b>

Source: Warburg Research

- **Lithography** (excl. Tamarack): Sales in the core lithography business should remain broadly stable in the 2017-20e period. The increase in annual capacity additions for advanced packaging applications and increasing volumes of MEMS should provide for healthy demand.
- **Photomask Equipment** reached average sales of EUR 23m in the 2010-16 period (low 18m – high 36m). SÜSS commands a share of about 80% of this niche market. Demand is expected to remain broadly stable in the near future.
- Sales in the **substrate bonder** segment should surge from EUR 14m to > EUR 50m or more by 2020 (see below).
- Thanks to market share gains and continued growth in the target application FOWLP (fan-out wafer level packaging), revenue contributions from **UV projection scanners and laser ablation systems** should begin to rise from 2018 onwards. We assume **sales contributions of EUR 30m by 2020** in a base case. In a more positive scenario, revenues might reach EUR 40-50m. In comparison, Ultratech generated USD 100-120m in sales with its steppers in 2015/16 and SÜSS's scanners are expected to cover 50-75% of today's stepper applications. Moreover, equipment demand for advanced lithography tools is expected to rise in the 2018-20 period.
- In the **others** segment, SÜSS generates sales mostly from micro-optics. The company broadened its product / customer base in the recent years, which should lead to a continued sales growth of ~10% p.a.

**Bonder sales** are expected to surge from EUR 14m in 2016 to EUR 55m by 2020. Temporary bonders are expected to initially contribute to revenue in 2017. Based on our



market projections, system demand (bonders + de-bonders) should reach 5–10 tools in the 2018-2020e period. Our **sales projections** (in total EUR 65m in the 2017-20e period) **only reflect the lower end of this range**. Order intake for automated permanent bond systems is expected to rise from Q1 2018 onwards. We are estimating double-digit sales contributions from FY 2019 onwards.

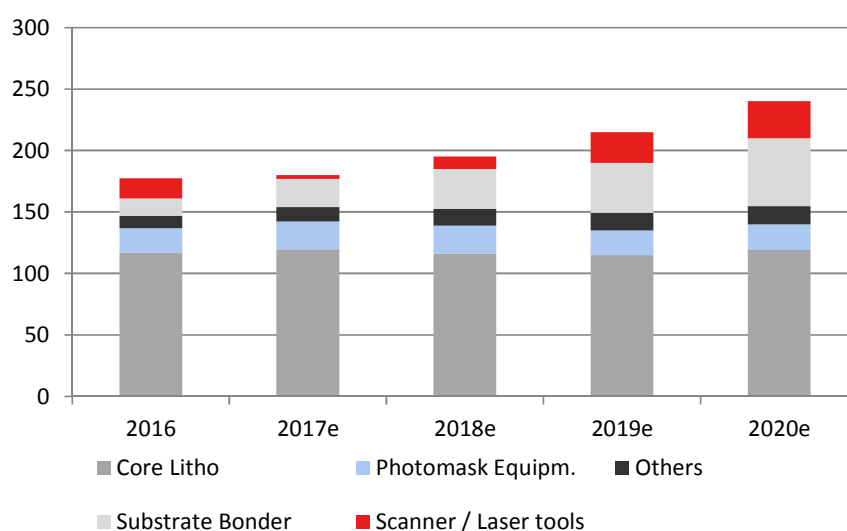
#### Substrate bonder revenues

	2016	2017e	2018e	2019e	2020e
Manual Bonders	14,0	14,0	11,0	13,0	12,0
Automated permanent bonders	0,0	0,0	4,0	10,0	19,0
Temporary bonders / de-bonders	0,0	9,0	14,0	17,5	24,0
<b>Total</b>	<b>14,0</b>	<b>23,0</b>	<b>29,0</b>	<b>40,5</b>	<b>55,0</b>

Source: Warburg Research

Group revenues are thus expected to increase by 35% in the 2016-20e period to a level of EUR 240m.

#### Group sales



Source: Warburg Research

#### EBIT to reach 15% by 2020

#### Achievable EBIT margin of 15% or higher

Profitability was burdened by the costs/low margins in the substrate bonder and projection scanner (Tamarack) segments in recent years. EBIT margins reached an average ~5% in the 2011-16 period, despite consistently high profitability of 19% (EBIT) in the core lithography business.

**Excluding the Tamarack-burden, SÜSS reached a ~14%-EBIT margin in 2016:**



**Profitability burdened by scanner business**

	2016	2017e
Group sales	177,6	180,0
Group EBIT	11,1	19,7
margin	6,3%	10,9%
Tamarack sales	16,5	3,0
Tamarack EBIT	-10,2	-7,5
Other one-offs	-0,8	
<b>Sales ex. Tamarack</b>	<b>161,1</b>	<b>177,0</b>
<b>EBIT ex. Tamarack / one-off</b>	<b>22,1</b>	<b>27,2</b>
<b>margin</b>	<b>13,7%</b>	<b>15,4%</b>

Source: Warburg Research

**40% gross margin would represent upside to mid-term margin**

**Only recently, SÜSS claimed to be aiming for 40% gross EBIT margin and 15% through the cycle.** Generally, the company should benefit from positive operating leverage effects, as a strong sales increase should only lead to limited cost increases at OPEX level, as most of the costs are of a fixed nature. **According to our model, SÜSS should achieve 15% EBIT margin on sales of EUR 240m at current gross margins of ~37%.** If the company achieves a 40% gross margin, sales of ~ EUR 225m would be sufficient for a 15% EBIT margin. Higher sales would result in an operating margin closer to 17%. **The 40% gross margin target has not been factored into the model yet.**

At segment level, margins should remain the highest (15-20%) in the core lithography business, closely followed by the bonder segment (>15%) once economies of scale kick in. Margins in the smaller photomask business should hover between 10% and 15% depending on the sales base while the scanner business could deliver >10% once sales cross the EUR 30m-mark. In the other area, earnings from the micro optics business should offset corporate costs (in our model, EUR 2m licence fee until 2019 is included here).

**Segment results**

	2016	2017e	2018e	2019e	2020e
Lithography (core) sales	117,3	119,5	120,0	115,0	119,0
Lithography (core) EBIT	23,4	20,9	21,0	19,1	20,5
margin	19,9%	17,5%	17,5%	16,6%	17,2%
Scanner + laser tools sales	16,5	3,0	6,0	25,0	30,0
Scanner + laser tools EBIT	-10,2	-7,5	-5,5	2,0	3,0
margin	-61,8%	-250,0%	-91,7%	8,0%	10,0%
Substrate bonder sales	14,0	23,0	32,5	40,5	55,0
Substrate bonder EBIT	-1,7	3,0	4,4	6,5	11,0
margin	-12,1%	13,0%	13,5%	16,0%	20,0%
Photomask sales	19,7	23,0	23,0	20,0	21,0
Photomask EBIT	1,8	3,7	3,2	2,2	2,4
margin	9,2%	16,0%	14,0%	11,0%	11,5%
Other sales	10,1	11,5	13,5	14,5	15,0
Other EBIT	-2,1	-0,4	0,4	0,8	-0,6
<b>Group sales</b>	<b>177,6</b>	<b>180,0</b>	<b>195,0</b>	<b>215,0</b>	<b>240,0</b>
<b>Group EBIT</b>	<b>11,1</b>	<b>19,7</b>	<b>23,5</b>	<b>30,6</b>	<b>36,3</b>
<b>margin</b>	<b>6,3%</b>	<b>10,9%</b>	<b>12,1%</b>	<b>14,2%</b>	<b>15,1%</b>

Source: Warburg Research

## Balance & Free Cash Flow

The balance sheet is considered to be rock solid with a **net cash position of almost EUR 40m expected for the end of 2017** and an **equity ratio of ~70%**.

Free cash flow development has been burdened by low profitability in recent years while 2016 was additionally burdened by unfavourable working capital development. This, however, should reverse in FY 2017. The company usually has to finance a relatively high working capital of ~35% of sales. Growth thus initially consumes free cash. Generally, the better earnings profile should nevertheless lead to **more attractive free cash flow development in the coming years**.

The existing cash pile and improving cash flow profile puts SÜSS in a position to pursue M&A when the opportunity arises. Alternatively, the company would be able to initiate dividend payments for the first time in its history.

**Solid net cash position to rise further**

### Net cash to rise

	2016	2017e	2018e	2019e	2020e
Operating cash flow	-5,4	13,4	17,7	17,3	17,1
Free cash flow	-9,0	7,4	14,2	13,8	13,6
Net cash	31,1	38,5	52,6	66,4	80,0
Equity	124,4	136,0	151,2	172,5	197,6
Equity ratio	69,2%	70,4%	71,8%	74,2%	76,3%

Source: Warburg Research

## New 2018/19 estimates are clearly ahead of consensus expectations

The following table shows the increase in estimates on the back of more optimistic assumptions especially for the substrate bonder business. The EBIT forecasts for 2018 and 2019 have been raised by 12% and 19% respectively.

**WR estimates 32% ahead of cons. 2019 EBIT**

### New estimates clearly ahead of consensus estimates

	2017e	2018e	2019e
Consensus sales	178,5	188,2	198,5
WR sales old	180,0	187,0	202,0
<b>WR sales new</b>	<b>180,0</b>	<b>195,0</b>	<b>215,0</b>
<b>change</b>	<b>0,0%</b>	<b>4,3%</b>	<b>6,4%</b>
WR vs consensus	0,8%	3,6%	8,3%
Consensus EBIT	18,3	20,6	23,1
WR EBIT old	19,7	21	25,8
<b>WR EBIT new</b>	<b>19,7</b>	<b>23,5</b>	<b>30,6</b>
<b>change</b>	<b>-0,1%</b>	<b>11,9%</b>	<b>18,6%</b>
WR vs consensus	7,5%	14,1%	32,4%

Source: Warburg Research

At the same time, the **new estimates are clearly ahead of the consensus estimates** (14% and 32% at EBIT level for 2018 and 2019 respectively.). Hence, estimate upgrades should also lead to positive news-flow, once the sales prospects in substrate bonders and scanners become more visible. **In February next year, the company is to issue guidance for 2018, which is also expected to be ahead of today's consensus expectations.**

## Valuation

- The PT of EUR 21 is based on a DCF model
- The FCF value model indicates a fair value of EUR 16 (still based on a lower margin in FY 2019)
- The peer group supports the PT and indicates FV of EUR 21-23 based on 2019 EBIT/EBITDA multiples
- The acquisition multiples for Ultratech (acquired by Veeco) would imply a potential takeover price of EUR 25–30 per share

## DCF model

The DCF model was updated and now reflects EUR 240m in sales by 2020 and an EBIT margin of 15%. The **model yields a fair value of EUR 21**.

- Low to mid single-digit growth rates are expected beyond 2020.
- The EBIT margin is assumed to remain flat at ~15%, gross margin improvements would support a higher level.

Other assumptions include a beta of 1.3, which leads to WACC of 8.53%.

Further upside would result from the materialization of the high case for 2020 (EUR 280m sales) or a 40% gross margin, which would result in ~17% EBIT margins.

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**PT of EUR 21 yield >30% upside**

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## DCF model

Figures in EUR m	Detailed forecast period			Transitional period										Term. Value
	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	
Sales	180.0	195.0	215.0	239.1	251.0	263.6	274.1	285.1	296.5	305.4	314.6	320.8	325.7	1.5 %
Sales change	1.4 %	8.3 %	10.3 %	11.2 %	5.0 %	5.0 %	4.0 %	4.0 %	4.0 %	3.0 %	3.0 %	2.0 %	1.5 %	
EBIT	19.7	23.5	30.6	35.9	37.7	39.5	41.1	42.8	44.5	45.8	47.2	48.1	48.8	15.0 %
EBIT-margin	10.9 %	12.1 %	14.2 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	
Tax rate (EBT)	41.4 %	35.1 %	30.5 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	28.5 %	28.5 %	28.5 %	34
NOPAT	11.5	15.3	21.3	26.2	27.5	28.9	30.0	31.2	32.5	33.4	33.7	34.4	34.9	
Depreciation	4.0	3.8	3.8	4.8	5.0	5.3	5.5	5.7	5.9	6.1	6.3	6.4	6.5	2.0 %
in % of Sales	2.2 %	1.9 %	1.8 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	
Changes in provisions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Change in Liquidity from														
- Working Capital	2.1	1.4	7.8	2.8	1.8	4.4	0.9	2.3	2.3	2.9	3.0	2.1	1.6	6.7
- Capex	6.0	3.5	3.5	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.4	6.6	6.7	
Capex in % of Sales	3.3 %	1.8 %	1.6 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Free Cash Flow (WACC Model)	7.4	14.2	13.8	23.3	25.6	24.3	28.9	28.8	30.0	30.4	30.6	32.2	33.2	183
PV of FCF	7.5	13.3	11.9	18.6	18.8	16.5	18.1	16.6	15.9	14.8	13.8	13.3	12.7	
share of PVs	8.75 %			42.44 %										48.81 %

### Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	2.00 %	Financial Strength	1.10
Cost of debt (after tax)	2.9 %	Liquidity (share)	1.30
Market return	7.00 %	Cyclicality	1.60
Risk free rate	1.50 %	Transparency	1.10
		Others	1.40
<b>WACC</b>	<b>8.53 %</b>	<b>Beta</b>	<b>1.30</b>

### Valuation (m)

Present values 2029e	192		
Terminal Value	183		
Financial liabilities	5		
Pension liabilities	5		
Hybrid capital	0		
Minority interest	0		
Market val. of investments	0		
Liquidity	36	No. of shares (m)	19.1
<b>Equity Value</b>	<b>401</b>	<b>Value per share (EUR)</b>	<b>20.99</b>

### Sensitivity Value per Share (EUR)

		Terminal Growth									Delta EBIT-margin						
Beta	WACC	0.75 %	1.00 %	1.25 %	1.50 %	1.75 %	2.00 %	2.25 %	Beta	WACC	-1.5 pp	-1.0 pp	-0.5 pp	+0.0 pp	+0.5 pp	+1.0 pp	+1.5 pp
1.49	9.5 %	17.78	17.98	18.19	18.42	18.66	18.92	19.20	1.49	9.5 %	16.50	17.14	17.78	18.42	19.06	19.70	20.35
1.39	9.0 %	18.85	19.09	19.35	19.62	19.91	20.22	20.56	1.39	9.0 %	17.57	18.25	18.94	19.62	20.30	20.99	21.67
1.35	8.8 %	19.44	19.70	19.98	20.28	20.60	20.94	21.31	1.35	8.8 %	18.16	18.87	19.57	20.28	20.99	21.70	22.40
1.30	8.5 %	20.07	20.36	20.66	20.99	21.34	21.72	22.13	1.30	8.5 %	18.79	19.53	20.26	20.99	21.72	22.46	23.19
1.25	8.3 %	20.74	21.05	21.39	21.75	22.14	22.56	23.02	1.25	8.3 %	19.48	20.23	20.99	21.75	22.51	23.27	24.03
1.21	8.0 %	21.45	21.80	22.17	22.57	23.01	23.48	23.99	1.21	8.0 %	20.21	21.00	21.79	22.57	23.36	24.15	24.94
1.11	7.5 %	23.05	23.47	23.93	24.43	24.96	25.55	26.19	1.11	7.5 %	21.86	22.72	23.57	24.43	25.28	26.13	26.99

- Growth in segment bonder and of Tamarack should boost the revenues to > EUR 200m in the mid term
- Sustainable EBIT margin of 10% anticipated...
- ...after operating margins reached 14% in the core business (excl. Tamarack) in 2016

## Free Cash Flow Value Potential

The Free Cash Flow Value Potential model indicates a fair value of EUR 16 based on 2019e.

The 2020 scenario provides upside to ~EUR 20 based on higher sales and further margin improvement.

## Free Cash Flow Value Potential

Warburg Research's valuation tool "FCF Value Potential" reflects the ability of the company to generate sustainable free cash flows. It is based on the "FCF potential" - a FCF "ex growth" figure - which assumes unchanged working capital and pure maintenance capex. A value indication is derived via the perpetuity of a given year's "FCF potential" with consideration of the weighted costs of capital. The fluctuating value indications over time add a timing element to the DCF model (our preferred valuation tool).

in EUR m	2013	2014	2015	2016	2017e	2018e	2019e	
Net Income before minorities	-16.0	4.6	0.2	5.0	11.5	15.3	21.3	
+ Depreciation + Amortisation	6.0	4.2	4.2	4.2	4.0	3.8	3.8	
- Net Interest Income	-0.1	-0.2	-0.3	-0.6	0.0	0.0	0.0	
- Maintenance Capex	2.2	2.2	2.2	2.2	2.4	2.5	2.7	
+ Other	13.2	-0.4	0.0	3.1	-2.0	-2.0	-2.0	
<b>= Free Cash Flow Potential</b>	<b>1.2</b>	<b>6.5</b>	<b>2.5</b>	<b>10.7</b>	<b>11.1</b>	<b>14.6</b>	<b>20.4</b>	
FCF Potential Yield (on market EV)	1.0 %	7.1 %	3.2 %	9.4 %	4.1 %	5.7 %	8.4 %	
WACC	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	
<b>= Enterprise Value (EV)</b>	<b>117.7</b>	<b>91.6</b>	<b>78.1</b>	<b>113.2</b>	<b>270.3</b>	<b>256.1</b>	<b>242.4</b>	
<b>= Fair Enterprise Value</b>	<b>13.9</b>	<b>75.7</b>	<b>29.0</b>	<b>125.2</b>	<b>130.4</b>	<b>170.5</b>	<b>238.6</b>	
- Net Debt (Cash)	-31.1	-31.1	-31.1	-31.1	-38.5	-52.6	-66.4	
- Pension Liabilities	4.8	4.8	4.8	4.8	4.8	4.8	4.8	
- Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
- Market value of minorities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
+ Market value of investments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>= Fair Market Capitalisation</b>	<b>40.1</b>	<b>101.9</b>	<b>55.3</b>	<b>151.4</b>	<b>164.0</b>	<b>218.3</b>	<b>300.2</b>	
Aktienanzahl (Mio.)	19.1	19.1	19.1	19.1	19.1	19.1	19.1	
<b>= Fair value per share (EUR)</b>	<b>2.10</b>	<b>5.33</b>	<b>2.89</b>	<b>7.92</b>	<b>8.58</b>	<b>11.42</b>	<b>15.70</b>	
premium (-) / discount (+) in %					-46.0 %	-28.2 %	-1.2 %	
<b>Sensitivity Fair value per Share (EUR)</b>								
WACC	11.53 %	1.91	4.31	2.50	6.22	6.81	9.11	12.47
	10.53 %	1.96	4.59	2.61	6.68	7.29	9.74	13.34
	9.53 %	2.03	4.92	2.74	7.24	7.87	10.49	14.41
	<b>8.53 %</b>	<b>2.10</b>	<b>5.34</b>	<b>2.89</b>	<b>7.93</b>	<b>8.59</b>	<b>11.43</b>	<b>15.72</b>
	7.53 %	2.20	5.86	3.10	8.80	9.49	12.62	17.37
	6.53 %	2.32	6.55	3.36	9.93	10.68	14.16	19.54
	5.53 %	2.49	7.49	3.72	11.48	12.29	16.27	22.49

■ Increasing sales (Tamarack + bonder) and margins result in higher value indications in coming years

## Peer Group

The table on the following page shows a peer-group comparison. EV/EBITDA and EV/EBIT multiples indicate clear upside based on FYs 2018 & 2019, resulting from the expected margin expansion, which **underpins our PT of EUR 21**.

### Peer-group underpins PT based on WR estimates

A **2019 EV/EBITDA peer multiple of 11x** compares favourably with today's multiple of just below 8x for SÜSS (based on WR projections) and **results in a fair value of ~ EUR 21**.

A **2019 EV/EBIT peer multiple of > 13x** represents >50% upside to SÜSS's current 2019 multiple of just below 9x and **would result in a fair value of ~ EUR 23**.

BE Semiconductor, Rudolph Technologies and Veeco are considered the closest comparables owing to their exposure to the advanced packaging market. Other peers include German specialty equipment suppliers and global semiconductor equipment suppliers.

## Peer-Group

Company	LC	Price in LC	MC in LC m	EV in LC m	P / E			EV / Sales			EV / EBITDA			EV / EBIT		
					17e	18e	19e	17e	18e	19e	17e	18e	19e	17e	18e	19e
<i>Closest Comparables</i>																
BE Semiconductor Industries N.V.	EUR	68.75	2,752.3	2,666.9	17.93	16.33	16.17	4.58	4.50	4.34	12.26	12.81	12.74	13.30	13.97	13.86
Rudolph Technologies, Inc.	USD	26.75	845.0	685.6	22.86	19.44	16.21	2.69	2.45	2.21	11.66	10.02	9.39	13.87	11.34	8.74
Veeco Instruments Inc.	USD	16.50	798.9	748.6	38.60	24.63	16.50	1.54	1.17	1.12	18.65	13.39	12.14	neg.	neg.	67.48
Median closest comparables					22.86	19.44	16.21	2.69	2.45	2.21	12.26	12.81	12.14	13.58	12.65	13.86
<i>German specialty equipment</i>																
AIXTRON SE	EUR	14.26	1,608.1	1,387.9	neg.	108.74	56.64	5.99	5.63	4.93	195.96	44.27	29.04	neg.	70.51	38.55
LPKF Laser & Electronics AG	EUR	9.13	203.3	240.0	183.95	42.88	26.33	2.48	2.24	2.05	22.89	14.51	11.48	95.80	30.68	19.92
Manz AG	EUR	40.09	310.5	255.0	42.24	15.07	13.81	0.69	0.60	0.57	9.58	6.27	5.84	22.15	9.14	8.46
Pfeiffer Vacuum Technology AG	EUR	163.15	1,609.9	1,585.6	26.53	22.32	21.60	2.72	2.51	2.47	14.99	12.74	12.29	18.34	15.30	14.67
Median German specialty equipm.					42.24	32.60	23.97	2.60	2.37	2.26	18.94	13.62	11.88	22.15	22.99	17.30
<i>Small- / mid cap automotive</i>																
Applied Materials, Inc.	USD	56.33	60,075.2	58,147.4	17.53	15.38	14.08	4.01	3.62	3.41	13.28	11.64	11.09	14.51	12.79	12.74
ASML Holding NV	EUR	158.20	68,257.7	68,536.8	35.38	28.70	23.01	7.98	6.91	6.33	25.60	21.95	18.53	30.28	25.29	20.77
ASM International N.V.	EUR	61.00	3,800.1	3,035.5	18.19	16.46	15.22	4.21	3.88	3.62	19.69	17.04	14.77	27.32	22.60	19.56
BE Semiconductor Industries N.V.	EUR	68.75	2,752.3	2,666.9	17.93	16.33	16.17	4.58	4.50	4.34	12.26	12.81	12.74	13.30	13.97	13.86
KLA-Tencor Corporation	USD	105.51	16,534.3	16,252.6	14.77	14.11	14.00	4.13	3.97	3.89	10.49	10.02	9.39	10.96	10.31	9.80
Kulicke & Soffa Industries, Inc.	USD	23.63	1,680.0	1,102.1	16.73	15.50	12.31	1.38	1.36	1.25	7.90	7.41	0.00	9.89	8.44	6.54
Lam Research Corporation	USD	206.67	33,469.4	29,857.4	14.23	13.82	13.50	2.88	2.77	2.77	9.12	8.89	8.24	9.64	9.29	9.58
Tokyo Electron Ltd.	JPY	2,315.00	3686,681.5	3331,823.5	19.52	17.91	16.77	3.14	2.91	2.77	12.24	11.03	10.18	13.27	12.11	11.32
Median Semic. Equipment					17.73	15.91	14.65	4.07	3.75	3.51	12.25	11.34	11.09	13.28	12.45	12.03
Median overall					18.86	16.46	16.17	3.14	2.91	2.77	12.26	12.74	11.81	13.87	13.38	13.86
<b>SÜSS MicroTec</b>	<b>EUR</b>	<b>16.00</b>	<b>305.6</b>	<b>272.0</b>	<b>26.67</b>	<b>20.00</b>	<b>14.41</b>	<b>1.51</b>	<b>1.39</b>	<b>1.27</b>	<b>11.49</b>	<b>9.96</b>	<b>7.91</b>	<b>13.82</b>	<b>11.57</b>	<b>8.89</b>
Valuation difference to Median (overall)					-29%	-18%	12%	108%	108%	119%	7%	28%	49%	0%	16%	56%
Fair value per share based on Median (overall)					11.31	13.17	17.94	31.36	31.45	32.92	16.96	19.96	23.03	16.05	18.22	23.96

Source: Factset; Warburg Research

## M&A

In February 2017, Veeco announced the acquisition of peer Ultratech for USD 815m (EV USD 550m). The table below shows the transaction multiples. It becomes clear that in an **M&A scenario, similar multiples would lead to a transaction valuation of >= EUR 500m, or more than EUR 25 per share for SÜSS MicroTech.**

**Recent sector M&A multiples would yield transaction price of EUR 25-30**

As Veeco / Ultratech is expected to suffer from market share losses to SÜSS, the company might be interested in acquiring SÜSS to further improve the positioning in advanced packaging applications. The main obstacle however is the difference in corporate culture between the US-based company and SÜSS as a typical German "Mittelstand" company (the scanner activities however are located in Corona, US).

## Veeco/Ultratech transaction

UTEK multiples	2017e	2018e
UTEK sales USD	200m	225m
UTEK EBITDA USD	33m	38m
UTEK EV in acquisition	USD 550m	
EV / sales	2.75x	2.44x
EV / EBITDA	16.66x	14.47x
Implied value SÜSS	2018e	2019e
SÜSS sales	195m	215m
SÜSS EBITDA	27,3m	34,4m
<b>Implied EV SÜSS (EUR)</b>	<b>450 - 535m</b>	<b>500 - 530m</b>
Net cash (end 2017)	EUR 39m	
Implied transaction value	EUR 490 - 575m	
<b>Implied takeover price</b>	<b>EUR 25 - 30</b>	

Source: Factset; Warburg Research

Other potential acquirers include Rudolph Technologies (active in panel lithography) or Kulicke & Soffa (which recently acquired Dutch Liteq, a lithography start-up also based on stepper technology, but is late in presenting a first customer). Dutch-based BE Semiconductor was sometimes rumoured as a potential buyer. However, we do not expect BESI to make a bid at the higher price levels considering the low level of operational synergies.

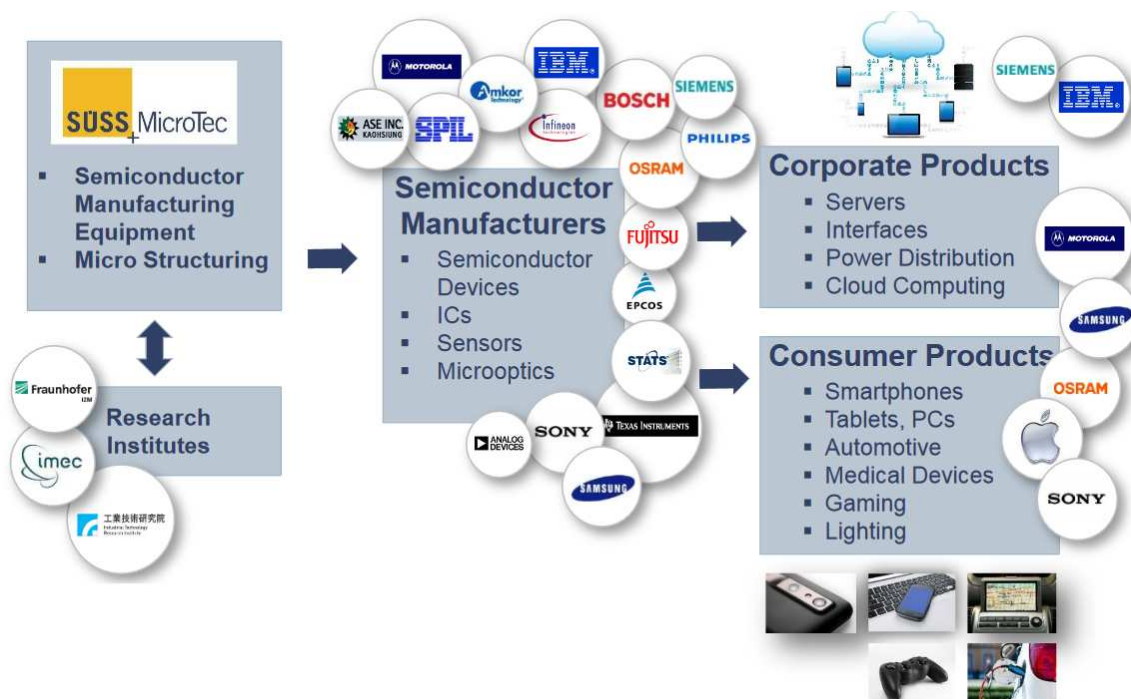


## Company & Products

### Markets

The following chart shows that most SÜSS products (apart from photomask cleaning and microoptics) are being used in a variety of end markets. The company supplies its equipment to customers such as Bosch, Epcos, Samsung, Amkor, TSMC etc., which produce semiconductors, sensors or other MEMS which find their ultimate use in everyday products such as smartphones, cars, servers and other devices.

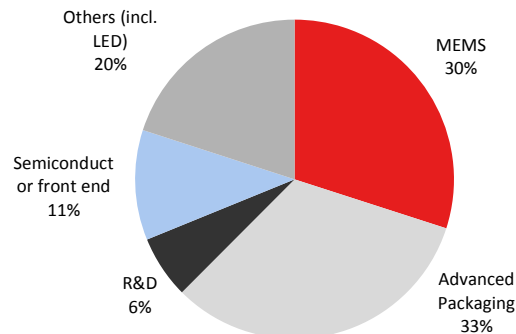
#### Products / markets



Source: SÜSS; Warburg Research

MEMS (sensors etc.) and semiconductor packaging represent SÜSS's main target markets (~30% each). Additional markets include a niche application in the semiconductor front end (photomask cleaning), sales to R&D institutions and smaller contributions from the LED market.

#### Revenue split (WRe 2017)



Source: Warburg Research

The **mix, the variety of end applications, and positive structural trends** (increasing share of advanced packaging at cost of incumbent wire bonding technology) **increase the company's resilience to semiconductor cycles**.

The positive structural trend is e.g. reflected in the use of wafer level packaged ICs (WLP), which have surged from two in the first generation to 44 in the iPhone 7 generation. On average, there are 15 WLPs per smartphone, which reflects that there is still room for strong growth in WLP content per mobile device. The same holds true for sensors and other MEMS devices in smartphone, car and especially IoT applications.

#### Increasing use of WLPs



Source: TechSearch

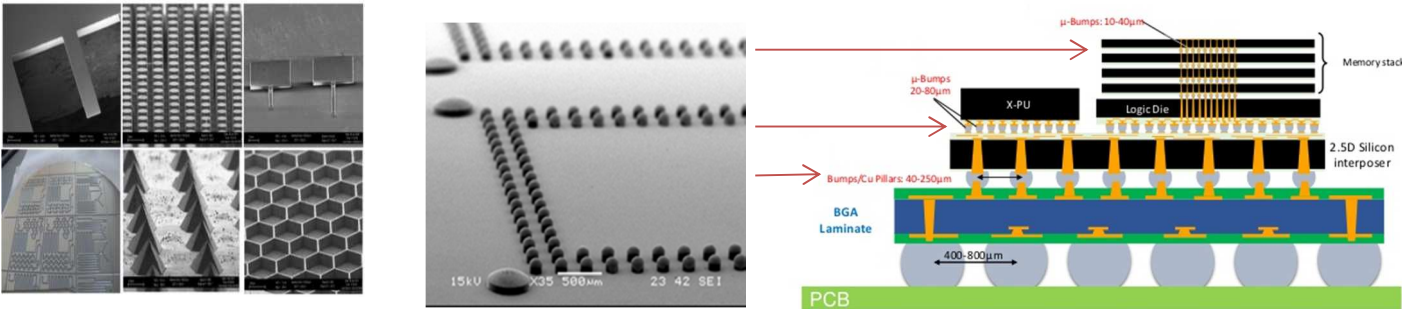
## Lithography

The mask aligner and coaters are the foundation of SÜSS's product portfolio and are used to create micro-structures on wafers. The products are supplied to customers from the semiconductor packaging, MEMS or LED industry. With a market share of ~30-50%,

SÜSS is the market leader in both categories in these niche markets. In advanced packaging, SÜSS continues to benefit from increasing penetration as AP is substituting the incumbent wire bonding technology (one-way street: performance requirements are driving the increased use of advanced packaging - there is no way back to wire bonding).

The lithography tools are being used to create microstructures for MEMS or semiconductor packages, which are finally used in industrial, medical or consumer products (e.g. mobile devices such as smartphones).

Lithography systems enable microstructures in MEMS / semiconductor packaging



Source: Amkor; Yole; Warburg Research

Mask Aligner

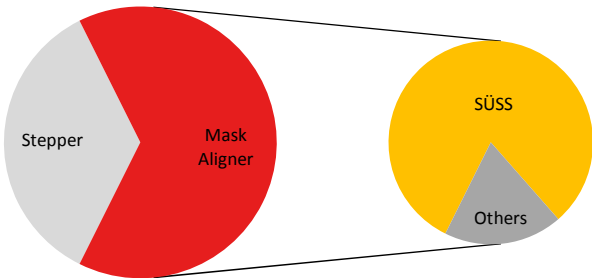
Mask Aligners are the **work horse of the exposure lithography tools**. While they are restricted to a resolution of >5 micron, they are the tool of choice when technical requirements are not that tight. Mask aligners **come with high throughput and low costs** of ownership. While specifications in some applications are becoming too demanding (smaller structures), there is a steady stream of new applications, which are based on mask aligners for the first time. This is expected to lead to a balanced development in the coming years.

Mask Aligners outnumber steppers in volume application in terms of units. Steppers dominate in advanced packaging in USD terms due to the high sales price.

**SÜSS is clear global market leader in mask aligners with a market share of >60%.**

Exposure tool market

SÜSS #1 in mask aligner (units)



Stepper lead in adv. packaging in value (USD)

Advanced Packaging	MEMS devices
<div>Ultratech</div> <div>Ultratech</div> <div>58%</div>	<div>SÜSS MicroTec</div> <div>SÜSS MicroTec</div> <div>60%</div>
<div>SÜSS MicroTec</div> <div>SÜSS MicroTec</div> <div>12.5%</div>	
<div>RUDOLPH</div> <div>Rudolph</div> <div>9.5%</div>	<div>EVG</div> <div>EVG</div> <div>22%</div>
<div>Canon</div> <div>Canon</div> <div>9%</div>	
<div>SMEE</div> <div>SMEE</div> <div>9%</div>	<div>Ushio</div> <div>Ushio</div> <div>18%</div>
<div>USHIO</div> <div>Others, 2%</div>	

Source: Yole; Warburg Research

## Coaters

SÜSS is the leading supplier (share est. 30-50%) of coaters/developers which are used to coat the wafer with a photosensitive resist, before the exposure step (mask aligner, scanner). Target markets include semiconductor packaging (advanced packaging), MEMS and LED.

Competition includes used systems from Tokyo Electron usually used in the frontend production) and newly established Chinese players at the lower end. SÜSS positions its products at the higher end of the market and offers its customers customisation options, which differentiates the products especially from the used Tokyo Electron products.

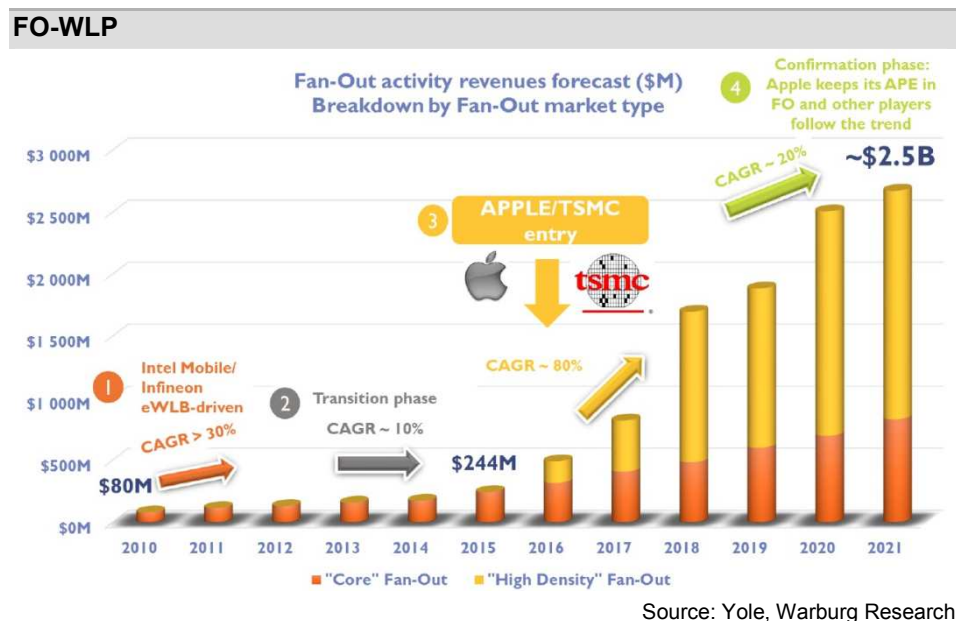
## Scanners

SÜSS acquired US-based Tamarack in 2012, to extend the product portfolio and to gain market share in applications with higher technological requirements (higher resolution). It took some time and further development efforts to achieve the first milestone order from TSMC in 2015. Unfortunately, the tool did not live up to expectations owing to poor system design (an avoidable failure, according to the new CEO). The consequence was high losses of > EUR 10m in 2016 and consideration to close the unit.

SÜSS strongly benefitted from the arrival of the former and new CEO Dr. Franz Richter, who managed to resolve the technical issues. The new product generation (to be introduced in H1 2018) will match the performance of competing steppers from Ultratech (resolution down to ~ 1micron) but comes with almost double the throughput. Unsurprisingly, the company received positive customer feedback and decided to continue this product line (in July 2017).

SÜSS is the only supplier of scanners in the market and will mostly compete with US-based Ultratech. Scanners are expected to address roughly 50-75% of the applications, currently based on stepper technology. As Ultratech is generating stepper sales of ~ USD 100-120m p.a., a 40-50% market share gain represents a USD 40-60m sales opportunity. An expected follow-up order from TSMC is expected to signal to other customers that the system has been successfully improved and is technologically mature.

Scanners specifically target fan-out WLP (FOWLP), which is a hot topic in advanced packaging (e.g. TSMC's InFo-process). The following chart shows that continued growth in this application is expected in the coming years.



Besides scanners, SÜSS is offering a tool for laser ablation. These systems are only in an early stage today (although qualified at a US-based IDM) and could lead to more significant sales contributions after 2020.

## Substrate Bonders

SÜSS is supplying three different types of substrate bonders: manual systems, used in the LED and MEMS market, automated permanent bond systems used in the MEMS market and temporary bonders/de-bonders for the stacking of 3D ICs (e.g. stacked memory) and some MEMS applications (e.g. CMOS image sensors).

SÜSS achieves a low market share of only ~15%, as the market is dominated by the Austrian competitor EVG. This however, is expected to change.

### Permanent Bonders

SÜSS failed to introduce an automated bond cluster tool earlier in the decade and pulled the plug in 2013 (again due to design failure and wrong positioning). SÜSS made a new attempt in recent years. The difference is that SÜSS chose to base the product on the mature and proven coater-platform. Flaws in the system design could thus be ruled out. The high number of similar parts was favourable to margins and time-to-market was short. SÜSS was able to introduce the system already early in 2017. Furthermore it comes with some features that differentiate the product from the competition and should be beneficial to operation.

EVG is expected to generate sales of EUR 75-100m with permanent bonders. As customers have approached SÜSS to supply bond tools (to avoid a monopoly by EVG) and as the product should have some advantages, SÜSS could conceivably achieve a 25-40% market share in the medium term. This represents a EUR 20-40m sales opportunity in ~4-5 years. Technology adoption is expected to be closely linked to the introduction of new products by customers. This should result in a gradual increase in sales contributions.

SÜSS should be on track to achieve the first order intakes for the new bond systems in Q4 2017.

### Temporary Bonders

Temporary bonders are required in the production of 3D chips. Chip stacking contributes to performance increases (in a given area) where there are technical or economic limitations to further classical shrinking (Moore's law). For 3D ICs, several wafer layers are stacked on top of each other and each one is thinned to ~50 micron, which is thinner than a human hair. It can be seen easily that processing of these thin wafers is especially demanding, as issues like bow/warping arise. Certain process steps require the temporary bond and subsequent de-bond to a carrier/support wafer.

After the initial high expectations for 3D ICs did not materialize earlier in the decade, SÜSS's strong efforts are now coming to fruition, as the company gained orders for three bonder / de-bonders since the beginning of 2017. This fits to the product announcements of the large memory chip producers (Samsung, SK Hynix, Toshiba). Stacked memory ICs are expected to represent the first true TSV-based 3D IC mass application. Main drivers of the adoption are performance (bandwidth / capacity / power efficiency increase) or the small form factor. TSV-based packaging is typically more costly than traditional technologies, which is why costs are rather a hurdle than a driver. The cost can only be a positive driver if the move to the next technology node (traditional scaling) is more expensive than a performance increase via 3D.

SÜSS is the only remaining equipment supplier shipping temporary bonding / de-bonding systems to customers with volume applications (WRe: Samsung). SÜSS benefits from a close cooperation with Thin Materials (now Nissan Chemicals), which is one of the main adhesive suppliers. We expect that SÜSS to have about two years of a technological lead,

especially in DRAM-related temporary bonding applications (material-related). We expect that SK Hynix will also adopt the bonding equipment from SÜSS for their 3D memory products. The following table again shows the expected equipment market potential:

<b>Temporary bonder / de-bonder market potential</b>				
Application	Potential # of wafers (in thousand p.a.)		Required bond /de-bond tools	
	2020	2025	2020	2025
CIS hybrid bonding	400	1.000	8	16
DRAM DDR4/5	1.000	2.900	20	46
DRAM Graphics (HBMx)	140	220	4	4
<b>"Likely" market potential</b>	<b>1.540</b>	<b>4.120</b>	<b>32</b>	<b>66</b>
DRAM low cost HBM	260	630	6	10
NAND	700	3.000	14	46
FOWLP (only laser de-bonding)	1.600	2.400	16	19
<b>Total market potential</b>	<b>4.100</b>	<b>10.150</b>	<b>68</b>	<b>141</b>
<b>Total equipment market opportunity '17-'25 (m USD)</b>				<b>ca.600m</b>
<b>Tool market</b>			<b>2017-20e</b>	<b>2021-25e</b>
<b>Average tool demand p.a. "likely"</b>			<b>8</b>	<b>7</b>
<b>Average tool demand p.a. total</b>			<b>17</b>	<b>15</b>

Source: Warburg Research

We assume that SÜSS can achieve an almost 100% market share in the DRAM-related applications until 2020 (as single source equipment supplier to Samsung / SK Hynix). Considering EVG's 80% market share in permanent bonding (and 100% in sub-market areas), such development would not be unusual.

There might be stronger competition in the applications FO-WLP, where EVG is also offering a tool for laser-assisted de-bonding and NAND storage, where Tokyo Electron is expected to be a potential tool supplier for Japanese-based Toshiba.

The following chart shows how we derive the wafer forecast for memory (server + graphics DRAM; NAND; CIS) applications, on which the tool demand estimation is based.



<b>TSV applications</b>										
TSV based memory / CIS market	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>NAND</b>										
NAND GB	120	170	275	425	575	730	891	1.033	1.137	1.228
hereof SSD	45	70	124	213	316	438	579	723	796	859
NAND wafer demand in k	15.000	17.895	21.442	24.547	24.600	26.035	27.620	28.105	28.363	28.628
<b>TSV based 3D NAND Wafer p.a.</b>	<b>0</b>	<b>73</b>	<b>193</b>	<b>368</b>	<b>677</b>	<b>1.250</b>	<b>1.975</b>	<b>2.951</b>	<b>2.978</b>	<b>3.006</b>
TSV based 3D NAND as% of SSD	0,0%	1,0%	2,0%	3,0%	5,0%	8,0%	11,0%	15,0%	15,0%	15,0%
<b>DRAM</b>										
DRAM Gbit	74	91	120	140	160	179	197	217	239	258
hereof server	18	23	31	38	45	52	59	67	76	85
server share	24%	25%	26%	27%	28%	29%	30%	31%	32%	33%
hereof graphics	4	6	8	11	13	14	16	17	19	21
graphics share	6%	7%	7%	8%	8%	8%	8%	8%	8%	8%
DRAM wafer demand in k	12.219	12.843	14.727	14.940	14.848	14.848	14.848	14.848	14.848	14.848
TSV based wafers for server (>= 64GB modules; HBMx)	293	417	689	1.008	1.247	1.722	2.227	2.762	2.851	2.940
TSV based wafers share of server	10,0%	13,0%	18,0%	25,0%	30,0%	40,0%	50,0%	60,0%	60,0%	60,0%
TSV based wafers for graphics (HBMx, HMC)	15	33	72	112	143	166	178	190	202	214
TSV based wafers share of graphics	2,0%	4,0%	7,0%	10,0%	12,0%	14,0%	15,0%	16,0%	17,0%	18,0%
<b>TSV based DRAM wafers</b>	<b>308</b>	<b>451</b>	<b>761</b>	<b>1.121</b>	<b>1.390</b>	<b>1.889</b>	<b>2.405</b>	<b>2.952</b>	<b>3.053</b>	<b>3.154</b>
<b>TSV based memory wafers in k</b>	<b>308</b>	<b>524</b>	<b>954</b>	<b>1.489</b>	<b>2.066</b>	<b>3.138</b>	<b>4.380</b>	<b>5.903</b>	<b>6.031</b>	<b>6.160</b>
<b>CIS</b>										
CIS Wafer total	2.550	2.750	2.950	3.150	3.400	3.638	3.874	4.107	4.353	4.571
CIS Wafer BSI hybrid	204	275	354	441	544	655	736	821	914	1.006
share	8%	10%	12%	14%	16%	18%	19%	20%	21%	22%

Source: IHS, Micron, Nanya, Yole, Warburg Research

## Manual Bonders

The manual bond tools (MEMS) also benefitted from the introduction of a new product generation, which led to increased orders in H2 2016. Future development of sales in this area is expected to be roughly flat, in a range of EUR 10–15m p.a. Main competitor here is also Austrian-based EVG.

## Photomask Cleaning Equipment

This business was acquired in 2010 and addresses the niche market of cleaning tools for photomasks in the semiconductor front end (wafer processing). The wet chemical technology is complementary to the coaters / developers. SÜSS holds an ~80% market share.

Owing to the more demanding production process (more masks, more cleaning steps with EUV), the demand of 4-5 systems p.a. should remain relatively stable in future.

## Micro-optics

The smallest division supplies micro-optics used in the company's mask aligners and micro-optics to other customers for fiber coupling, beam shaping, photolithography or laser beam shaping applications. SÜSS has doubled sales to EUR 10m in the past two years. A continued broadening of the customer base should lead to further top-line growth in the future.



## DCF model

Figures in EUR m	Detailed forecast period			Transitional period										Term. Value
	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	
Sales	180.0	195.0	215.0	239.1	251.0	263.6	274.1	285.1	296.5	305.4	314.6	320.8	325.7	1.5 %
Sales change	1.4 %	8.3 %	10.3 %	11.2 %	5.0 %	5.0 %	4.0 %	4.0 %	4.0 %	3.0 %	3.0 %	2.0 %	1.5 %	
EBIT	19.7	23.5	30.6	35.9	37.7	39.5	41.1	42.8	44.5	45.8	47.2	48.1	48.8	15.0 %
EBIT-margin	10.9 %	12.1 %	14.2 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	
Tax rate (EBT)	41.4 %	35.1 %	30.5 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	27.0 %	28.5 %	28.5 %	28.5 %	34
NOPAT	11.5	15.3	21.3	26.2	27.5	28.9	30.0	31.2	32.5	33.4	33.7	34.4	34.9	
Depreciation	4.0	3.8	3.8	4.8	5.0	5.3	5.5	5.7	5.9	6.1	6.3	6.4	6.5	2.0 %
in % of Sales	2.2 %	1.9 %	1.8 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %	
Changes in provisions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Change in Liquidity from														
- Working Capital	2.1	1.4	7.8	2.8	1.8	4.4	0.9	2.3	2.3	2.9	3.0	2.1	1.6	6.7
- Capex	6.0	3.5	3.5	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.4	6.6	6.7	
Capex in % of Sales	3.3 %	1.8 %	1.6 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	2.1 %	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Free Cash Flow (WACC Model)	7.4	14.2	13.8	23.3	25.6	24.3	28.9	28.8	30.0	30.4	30.6	32.2	33.2	183
PV of FCF	7.5	13.3	11.9	18.6	18.8	16.5	18.1	16.6	15.9	14.8	13.8	13.3	12.7	
share of PVs	8.75 %			42.44 %										48.81 %

### Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	2.00 %	Financial Strength	1.10
Cost of debt (after tax)	2.9 %	Liquidity (share)	1.30
Market return	7.00 %	Cyclicality	1.60
Risk free rate	1.50 %	Transparency	1.10
		Others	1.40
<b>WACC</b>	<b>8.53 %</b>	<b>Beta</b>	<b>1.30</b>

### Valuation (m)

Present values 2029e	192		
Terminal Value	183		
Financial liabilities	5		
Pension liabilities	5		
Hybrid capital	0		
Minority interest	0		
Market val. of investments	0		
Liquidity	36	No. of shares (m)	19.1
<b>Equity Value</b>	<b>401</b>	<b>Value per share (EUR)</b>	<b>20.99</b>

### Sensitivity Value per Share (EUR)

		Terminal Growth									Delta EBIT-margin						
Beta	WACC	0.75 %	1.00 %	1.25 %	1.50 %	1.75 %	2.00 %	2.25 %	Beta	WACC	-1.5 pp	-1.0 pp	-0.5 pp	+0.0 pp	+0.5 pp	+1.0 pp	+1.5 pp
1.49	9.5 %	17.78	17.98	18.19	18.42	18.66	18.92	19.20	1.49	9.5 %	16.50	17.14	17.78	18.42	19.06	19.70	20.35
1.39	9.0 %	18.85	19.09	19.35	19.62	19.91	20.22	20.56	1.39	9.0 %	17.57	18.25	18.94	19.62	20.30	20.99	21.67
1.35	8.8 %	19.44	19.70	19.98	20.28	20.60	20.94	21.31	1.35	8.8 %	18.16	18.87	19.57	20.28	20.99	21.70	22.40
1.30	8.5 %	20.07	20.36	20.66	20.99	21.34	21.72	22.13	1.30	8.5 %	18.79	19.53	20.26	20.99	21.72	22.46	23.19
1.25	8.3 %	20.74	21.05	21.39	21.75	22.14	22.56	23.02	1.25	8.3 %	19.48	20.23	20.99	21.75	22.51	23.27	24.03
1.21	8.0 %	21.45	21.80	22.17	22.57	23.01	23.48	23.99	1.21	8.0 %	20.21	21.00	21.79	22.57	23.36	24.15	24.94
1.11	7.5 %	23.05	23.47	23.93	24.43	24.96	25.55	26.19	1.11	7.5 %	21.86	22.72	23.57	24.43	25.28	26.13	26.99

- Growth in segment bonder and of Tamarack should boost the revenues to > EUR 200m in the mid term
- Sustainable EBIT margin of 10% anticipated...
- ...after operating margins reached 14% in the core business (excl. Tamarack) in 2016

### Free Cash Flow Value Potential

Warburg Research's valuation tool "FCF Value Potential" reflects the ability of the company to generate sustainable free cash flows. It is based on the "FCF potential" - a FCF "ex growth" figure - which assumes unchanged working capital and pure maintenance capex. A value indication is derived via the perpetuity of a given year's "FCF potential" with consideration of the weighted costs of capital. The fluctuating value indications over time add a timing element to the DCF model (our preferred valuation tool).

in EUR m	2013	2014	2015	2016	2017e	2018e	2019e	
Net Income before minorities	-16.0	4.6	0.2	5.0	11.5	15.3	21.3	
+ Depreciation + Amortisation	6.0	4.2	4.2	4.2	4.0	3.8	3.8	
- Net Interest Income	-0.1	-0.2	-0.3	-0.6	0.0	0.0	0.0	
- Maintenance Capex	2.2	2.2	2.2	2.2	2.4	2.5	2.7	
+ Other	13.2	-0.4	0.0	3.1	-2.0	-2.0	-2.0	
<b>= Free Cash Flow Potential</b>	<b>1.2</b>	<b>6.5</b>	<b>2.5</b>	<b>10.7</b>	<b>11.1</b>	<b>14.6</b>	<b>20.4</b>	
FCF Potential Yield (on market EV)	1.0 %	7.1 %	3.2 %	9.4 %	4.1 %	5.7 %	8.4 %	
WACC	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	8.53 %	
<b>= Enterprise Value (EV)</b>	<b>117.7</b>	<b>91.6</b>	<b>78.1</b>	<b>113.2</b>	<b>270.3</b>	<b>256.1</b>	<b>242.4</b>	
<b>= Fair Enterprise Value</b>	<b>13.9</b>	<b>75.7</b>	<b>29.0</b>	<b>125.2</b>	<b>130.4</b>	<b>170.5</b>	<b>238.6</b>	
- Net Debt (Cash)	-31.1	-31.1	-31.1	-31.1	-38.5	-52.6	-66.4	
- Pension Liabilities	4.8	4.8	4.8	4.8	4.8	4.8	4.8	
- Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
- Market value of minorities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
+ Market value of investments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>= Fair Market Capitalisation</b>	<b>40.1</b>	<b>101.9</b>	<b>55.3</b>	<b>151.4</b>	<b>164.0</b>	<b>218.3</b>	<b>300.2</b>	
Aktienanzahl (Mio.)	19.1	19.1	19.1	19.1	19.1	19.1	19.1	
<b>= Fair value per share (EUR)</b>	<b>2.10</b>	<b>5.33</b>	<b>2.89</b>	<b>7.92</b>	<b>8.58</b>	<b>11.42</b>	<b>15.70</b>	
premium (-) / discount (+) in %					-46.0 %	-28.2 %	-1.2 %	
<b>Sensitivity Fair value per Share (EUR)</b>								
WACC	11.53 %	1.91	4.31	2.50	6.22	6.81	9.11	12.47
	10.53 %	1.96	4.59	2.61	6.68	7.29	9.74	13.34
	9.53 %	2.03	4.92	2.74	7.24	7.87	10.49	14.41
	<b>8.53 %</b>	<b>2.10</b>	<b>5.34</b>	<b>2.89</b>	<b>7.93</b>	<b>8.59</b>	<b>11.43</b>	<b>15.72</b>
	7.53 %	2.20	5.86	3.10	8.80	9.49	12.62	17.37
	6.53 %	2.32	6.55	3.36	9.93	10.68	14.16	19.54
	5.53 %	2.49	7.49	3.72	11.48	12.29	16.27	22.49

■ Increasing sales (Tamarack + bonder) and margins result in higher value indications in coming years

<b>Valuation</b>							
	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>
Price / Book	1.4 x	1.1 x	1.0 x	1.1 x	2.2 x	2.0 x	1.8 x
Book value per share ex intangibles	4.69	5.02	5.16	5.49	6.12	6.94	8.09
EV / Sales	0.9 x	0.6 x	0.5 x	0.6 x	1.5 x	1.3 x	1.1 x
EV / EBITDA	n.a.	7.2 x	8.5 x	7.4 x	11.4 x	9.4 x	7.0 x
EV / EBIT	n.a.	10.9 x	15.7 x	10.2 x	13.7 x	10.9 x	7.9 x
EV / EBIT adj.*	n.a.	11.5 x	15.7 x	7.9 x	13.7 x	10.9 x	7.9 x
P / FCF	36.5 x	58.7 x	89.7 x	n.a.	41.2 x	21.5 x	22.1 x
P / E	n.a.	27.2 x	590.6 x	28.1 x	26.5 x	19.9 x	14.3 x
P / E adj.*	n.a.	27.2 x	590.6 x	19.2 x	26.5 x	19.9 x	14.3 x
Dividend Yield	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FCF Potential Yield (on market EV)	1.0 %	7.1 %	3.2 %	9.4 %	4.1 %	5.7 %	8.4 %
*Adjustments made for: -							

<b>Company Specific Items</b>							
	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017e</b>	<b>2018e</b>	<b>2019e</b>
Order entry	134.0	134.2	188.6	161.0	0.0	0.0	0.0
Order backlog	85.7	75.6	117.6	101.0	0.0	0.0	0.0

**Consolidated profit and loss**

In EUR m	2013	2014	2015	2016	2017e	2018e	2019e
<b>Sales</b>	<b>134.5</b>	<b>145.3</b>	<b>148.5</b>	<b>177.6</b>	<b>180.0</b>	<b>195.0</b>	<b>215.0</b>
Change Sales yoy	-17.9 %	8.0 %	2.2 %	19.6 %	1.4 %	8.3 %	10.3 %
COGS	112.7	96.5	99.2	119.0	113.2	122.9	134.8
<b>Gross profit</b>	<b>21.8</b>	<b>48.8</b>	<b>49.4</b>	<b>58.6</b>	<b>66.8</b>	<b>72.2</b>	<b>80.2</b>
Gross margin	16.2 %	33.6 %	33.2 %	33.0 %	37.1 %	37.0 %	37.3 %
Research and development	10.2	10.5	12.8	14.1	15.1	15.4	15.5
Sales and marketing	17.5	17.5	18.8	20.5	19.5	20.5	21.2
Administration expenses	15.0	14.2	13.3	13.6	14.0	14.4	14.7
Other operating expenses	4.1	2.7	4.4	3.5	0.5	0.3	0.2
Other operating income	5.5	4.5	4.9	4.3	2.0	2.0	2.0
Unfrequent items	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>EBITDA</b>	<b>-13.4</b>	<b>12.6</b>	<b>9.2</b>	<b>15.3</b>	<b>23.7</b>	<b>27.3</b>	<b>34.4</b>
Margin	-10.0 %	8.7 %	6.2 %	8.6 %	13.2 %	14.0 %	16.0 %
Depreciation of fixed assets	2.6	2.7	2.9	2.9	3.0	2.8	2.8
<b>EBITA</b>	<b>-16.0</b>	<b>9.9</b>	<b>6.2</b>	<b>12.4</b>	<b>20.7</b>	<b>24.5</b>	<b>31.6</b>
Amortisation of intangible assets	3.5	1.5	1.2	1.3	1.0	1.0	1.0
Goodwill amortisation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>EBIT</b>	<b>-19.4</b>	<b>8.4</b>	<b>5.0</b>	<b>11.1</b>	<b>19.7</b>	<b>23.5</b>	<b>30.6</b>
Margin	-14.4 %	5.8 %	3.3 %	6.3 %	10.9 %	12.1 %	14.2 %
<b>EBIT adj.</b>	<b>-6.2</b>	<b>8.0</b>	<b>5.0</b>	<b>14.2</b>	<b>19.7</b>	<b>23.5</b>	<b>30.6</b>
Interest income	0.5	0.3	0.3	0.1	0.2	0.2	0.2
Interest expenses	0.6	0.5	0.5	0.7	0.2	0.2	0.2
Other financial income (loss)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>EBT</b>	<b>-19.6</b>	<b>8.2</b>	<b>4.7</b>	<b>10.5</b>	<b>19.7</b>	<b>23.5</b>	<b>30.6</b>
Margin	-14.5 %	5.6 %	3.2 %	5.9 %	10.9 %	12.1 %	14.2 %
Total taxes	-3.6	3.6	4.5	5.5	8.2	8.3	9.3
<b>Net income from continuing operations</b>	<b>-16.0</b>	<b>4.6</b>	<b>0.2</b>	<b>5.0</b>	<b>11.5</b>	<b>15.3</b>	<b>21.3</b>
Income from discontinued operations (net of tax)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net income before minorities</b>	<b>-16.0</b>	<b>4.6</b>	<b>0.2</b>	<b>5.0</b>	<b>11.5</b>	<b>15.3</b>	<b>21.3</b>
Minority interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net income</b>	<b>-16.0</b>	<b>4.6</b>	<b>0.2</b>	<b>5.0</b>	<b>11.5</b>	<b>15.3</b>	<b>21.3</b>
Margin	-11.9 %	3.2 %	0.2 %	2.8 %	6.4 %	7.8 %	9.9 %
Number of shares, average	19.1	19.1	19.1	19.1	19.1	19.1	19.1
<b>EPS</b>	<b>-0.84</b>	<b>0.24</b>	<b>0.01</b>	<b>0.26</b>	<b>0.60</b>	<b>0.80</b>	<b>1.11</b>
EPS adj.	-0.27	0.24	0.01	0.38	0.60	0.80	1.11

\*Adjustments made for:

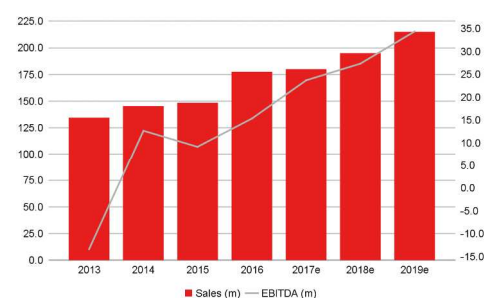
**Guidance: 2017: Revenues EUR 170 - 180m, EBIT EUR 15-19m**

**Financial Ratios**

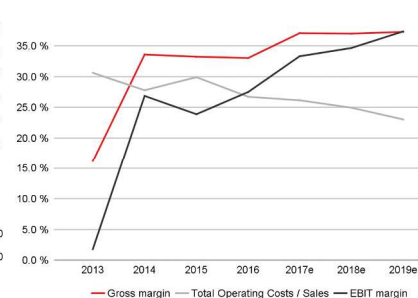
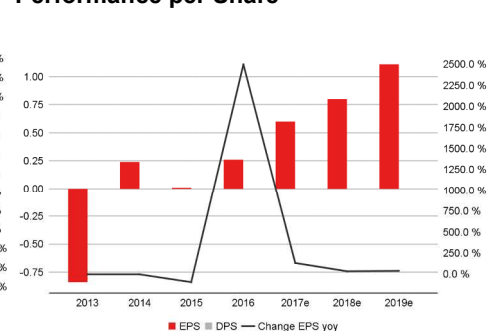
	2013	2014	2015	2016	2017e	2018e	2019e
Total Operating Costs / Sales	30.6 %	27.8 %	29.9 %	26.7 %	26.2 %	24.9 %	23.1 %
Operating Leverage	n.a.	n.a.	-18.6 x	6.3 x	56.2 x	2.3 x	2.9 x
EBITDA / Interest expenses	n.m.	23.2 x	17.4 x	21.2 x	118.4 x	136.5 x	172.0 x
Tax rate (EBT)	18.3 %	43.7 %	95.2 %	52.4 %	41.4 %	35.1 %	30.5 %
Dividend Payout Ratio	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Sales per Employee	205,356	221,879	212,774	249,063	274,809	297,710	328,244

**Sales, EBITDA**

in EUR m


**Operating Performance**

in %


**Performance per Share**


Source: Warburg Research

Source: Warburg Research

Source: Warburg Research

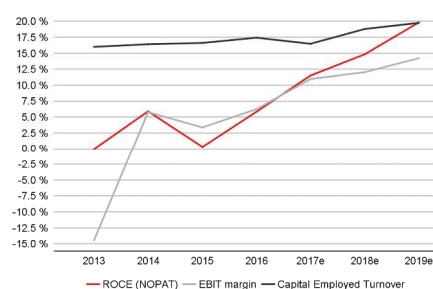
## Consolidated balance sheet

In EUR m	2013	2014	2015	2016	2017e	2018e	2019e
<b>Assets</b>							
Goodwill and other intangible assets	19.8	20.0	20.0	19.4	18.9	18.4	17.9
thereof other intangible assets	3.7	4.1	4.0	3.3	2.8	2.3	1.8
thereof Goodwill	15.3	15.5	15.8	15.8	15.8	15.8	15.8
Property, plant and equipment	20.9	20.2	20.3	20.6	23.1	23.3	23.5
Financial assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other long-term assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Fixed assets</b>	<b>40.7</b>	<b>40.2</b>	<b>40.3</b>	<b>39.9</b>	<b>42.0</b>	<b>41.7</b>	<b>41.4</b>
Inventories	71.1	58.9	68.7	73.8	81.8	84.8	91.5
Accounts receivable	11.1	13.4	13.1	24.1	18.2	19.8	21.8
Liquid assets	47.1	48.3	49.1	35.6	45.0	58.0	71.7
Other short-term assets	9.8	7.1	6.0	6.2	6.2	6.2	6.2
<b>Current assets</b>	<b>139.1</b>	<b>127.7</b>	<b>136.9</b>	<b>139.7</b>	<b>151.2</b>	<b>168.7</b>	<b>191.2</b>
<b>Total Assets</b>	<b>179.9</b>	<b>168.0</b>	<b>177.2</b>	<b>179.6</b>	<b>193.2</b>	<b>210.4</b>	<b>232.6</b>
<b>Liabilities and shareholders' equity</b>							
Subscribed capital	19.1	19.1	19.1	19.1	19.1	19.1	19.1
Capital reserve	94.0	98.6	98.8	103.8	103.8	103.8	103.8
Retained earnings	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other equity components	-3.7	-1.6	0.8	1.4	13.1	28.2	49.6
Shareholders' equity	109.4	116.1	118.7	124.4	136.0	151.1	172.5
Minority interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total equity</b>	<b>109.4</b>	<b>116.1</b>	<b>118.7</b>	<b>124.4</b>	<b>136.0</b>	<b>151.1</b>	<b>172.5</b>
Provisions	9.8	8.0	7.5	10.0	10.0	10.0	10.0
thereof provisions for pensions and similar obligations	3.8	4.8	5.1	4.8	4.8	4.8	4.8
Financial liabilities (total)	11.5	10.3	9.1	4.5	6.5	5.3	5.3
thereof short-term financial liabilities	1.2	1.2	1.2	1.0	1.0	1.0	1.0
Accounts payable	5.6	3.4	8.5	3.4	8.9	9.1	10.0
Other liabilities	43.6	30.2	33.4	37.4	31.8	34.8	34.8
<b>Liabilities</b>	<b>70.4</b>	<b>51.9</b>	<b>58.5</b>	<b>55.3</b>	<b>57.2</b>	<b>59.2</b>	<b>60.1</b>
<b>Total liabilities and shareholders' equity</b>	<b>179.9</b>	<b>168.0</b>	<b>177.2</b>	<b>179.6</b>	<b>193.2</b>	<b>210.4</b>	<b>232.6</b>

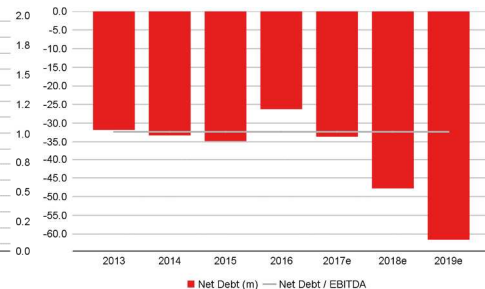
## Financial Ratios

	2013	2014	2015	2016	2017e	2018e	2019e
<b>Efficiency of Capital Employment</b>							
Operating Assets Turnover	2.0 x	2.0 x	2.0 x	1.9 x	1.9 x	2.0 x	2.0 x
Capital Employed Turnover	1.7 x	1.8 x	1.8 x	1.8 x	1.8 x	1.9 x	1.9 x
ROA	-39.2 %	11.5 %	0.6 %	12.5 %	27.4 %	36.6 %	51.4 %
<b>Return on Capital</b>							
ROCE (NOPAT)	n.a.	5.9 %	0.3 %	5.8 %	11.5 %	14.8 %	19.8 %
ROE	-13.4 %	4.1 %	0.2 %	4.1 %	8.9 %	10.6 %	13.1 %
Adj. ROE	-4.4 %	4.1 %	0.2 %	5.9 %	8.9 %	10.6 %	13.1 %
<b>Balance sheet quality</b>							
Net Debt	-31.8	-33.3	-34.8	-26.3	-33.7	-47.8	-61.6
Net Financial Debt	-35.7	-38.0	-40.0	-31.1	-38.5	-52.6	-66.4
Net Gearing	-29.1 %	-28.7 %	-29.3 %	-21.1 %	-24.8 %	-31.6 %	-35.7 %
Net Fin. Debt / EBITDA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Book Value / Share	5.7	6.1	6.2	6.5	7.1	7.9	9.0
Book value per share ex intangibles	4.7	5.0	5.2	5.5	6.1	6.9	8.1

### ROCE Development



### Net debt in EUR m



### Book Value per Share in EUR



Source: Warburg Research

Source: Warburg Research

Source: Warburg Research

## Consolidated cash flow statement

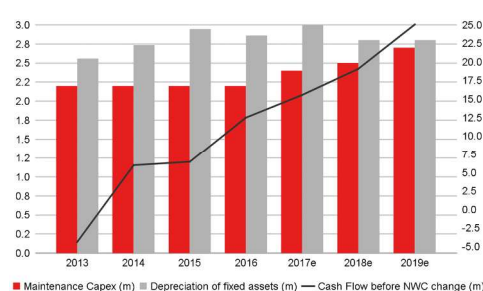
In EUR m	2013	2014	2015	2016	2017e	2018e	2019e
Net income	-16.0	4.6	0.2	5.0	11.5	15.3	21.3
Depreciation of fixed assets	2.6	2.7	2.9	2.9	3.0	2.8	2.8
Amortisation of goodwill	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amortisation of intangible assets	3.5	1.5	1.2	1.3	1.0	1.0	1.0
Increase/decrease in long-term provisions	-0.4	0.5	0.4	-0.4	0.0	0.0	0.0
Other non-cash income and expenses	5.9	-3.3	1.7	3.8	0.0	0.0	0.0
<b>Cash Flow before NWC change</b>	<b>-4.4</b>	<b>6.0</b>	<b>6.5</b>	<b>12.5</b>	<b>15.5</b>	<b>19.1</b>	<b>25.1</b>
Increase / decrease in inventory	-0.1	14.0	-7.7	-6.1	-8.0	-3.0	-6.7
Increase / decrease in accounts receivable	8.2	0.4	1.3	-10.7	5.9	-1.6	-2.0
Increase / decrease in accounts payable	12.7	-15.3	4.7	-1.1	-0.1	3.2	0.9
Increase / decrease in other working capital positions	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Increase / decrease in working capital (total)	20.7	-0.9	-1.8	-17.9	-2.1	-1.4	-7.8
<b>Net cash provided by operating activities [1]</b>	<b>16.3</b>	<b>5.1</b>	<b>4.7</b>	<b>-5.4</b>	<b>13.4</b>	<b>17.7</b>	<b>17.3</b>
Investments in intangible assets	0.6	1.2	0.8	0.5	0.5	0.5	0.5
Investments in property, plant and equipment	11.6	1.8	2.6	3.2	5.5	3.0	3.0
Payments for acquisitions	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial investments	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Income from asset disposals	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net cash provided by investing activities [2]</b>	<b>-12.2</b>	<b>-3.0</b>	<b>-3.4</b>	<b>-3.6</b>	<b>-6.0</b>	<b>-3.5</b>	<b>-3.5</b>
Change in financial liabilities	7.2	-1.2	-1.2	-4.6	2.0	-1.2	0.0
Dividends paid	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchase of own shares	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital measures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net cash provided by financing activities [3]</b>	<b>7.2</b>	<b>-1.2</b>	<b>-1.2</b>	<b>-4.6</b>	<b>2.0</b>	<b>-1.2</b>	<b>0.0</b>
<b>Change in liquid funds [1]+[2]+[3]</b>	<b>11.3</b>	<b>0.9</b>	<b>0.1</b>	<b>-13.6</b>	<b>9.4</b>	<b>13.0</b>	<b>13.8</b>
Effects of exchange-rate changes on cash	-0.5	0.3	0.7	0.2	0.0	0.0	0.0
<b>Cash and cash equivalent at end of period</b>	<b>36.0</b>	<b>46.3</b>	<b>48.1</b>	<b>35.7</b>	<b>45.0</b>	<b>58.0</b>	<b>71.7</b>

## Financial Ratios

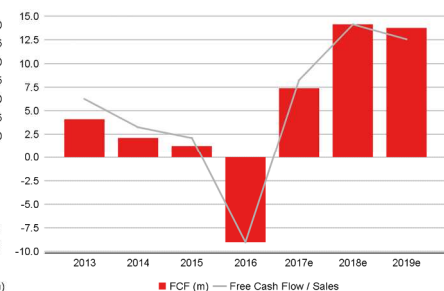
	2013	2014	2015	2016	2017e	2018e	2019e
<b>Cash Flow</b>							
FCF	4.1	2.1	1.3	-9.0	7.4	14.2	13.8
Free Cash Flow / Sales	3.0 %	1.5 %	0.8 %	-5.1 %	4.1 %	7.3 %	6.4 %
Free Cash Flow Potential	1.2	6.5	2.5	10.7	11.1	14.6	20.4
Free Cash Flow / Net Profit	-25.7 %	46.1 %	559.1 %	-180.3 %	64.0 %	92.8 %	64.7 %
Interest Received / Avg. Cash	1.1 %	0.7 %	0.5 %	0.2 %	0.5 %	0.4 %	0.3 %
Interest Paid / Avg. Debt	7.6 %	5.0 %	5.4 %	10.6 %	3.6 %	3.4 %	3.8 %
<b>Management of Funds</b>							
Investment ratio	9.1 %	2.0 %	2.3 %	2.1 %	3.3 %	1.8 %	1.6 %
Maint. Capex / Sales	1.6 %	1.5 %	1.5 %	1.2 %	1.3 %	1.3 %	1.3 %
Capex / Dep	202.7 %	69.6 %	81.6 %	87.8 %	150.0 %	92.1 %	92.1 %
Avg. Working Capital / Sales	46.6 %	33.4 %	35.8 %	35.8 %	40.6 %	38.4 %	36.9 %
Trade Debtors / Trade Creditors	199.0 %	388.6 %	154.5 %	717.2 %	204.5 %	217.6 %	218.0 %
Inventory Turnover	1.6 x	1.6 x	1.4 x	1.6 x	1.4 x	1.4 x	1.5 x
Receivables collection period (days)	30	34	32	50	37	37	37
Payables payment period (days)	18	13	31	10	29	27	27
Cash conversion cycle (Days)	132	163	177	178	207	191	192

## CAPEX and Cash Flow

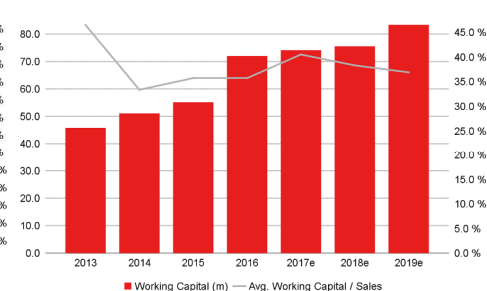
in EUR m



## Free Cash Flow Generation



## Working Capital



Source: Warburg Research

Source: Warburg Research

Source: Warburg Research

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Rating	Number of stocks	% of Universe
Buy	106	52
Hold	89	44
Sell	8	4
Rating suspended	0	0
<b>Total</b>	<b>203</b>	<b>100</b>

**WARBURG RESEARCH GMBH – ANALYSED RESEARCH UNIVERSE BY RATING ...**

... taking into account only those companies which were provided with major investment services in the last twelve months.

Rating	Number of stocks	% of Universe
Buy	32	76
Hold	9	21
Sell	1	2
Rating suspended	0	0
<b>Total</b>	<b>42</b>	<b>100</b>

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