aap Implantate

(CDAX, Health Care)

WARBURG RESEARCH

Buy	
EUR 2.00	
Price	EUR 0.83
Upside	141.5 %

Value Indicators:	EUR
DCF:	2.01

Share data:	
Bloomberg:	AAQ GR
Reuters:	AAQG.DE
ISIN:	DE0005066609

Description:

Producer of implants to mend broken bones

Market Snapshot:	EUR m
Market cap:	23.7
No. of shares (m):	28.6
EV:	26.7
Freefloat MC:	10.7
Ø Trad. Vol. (30d):	43.75 th

Shareholders:	
Freefloat	45.2 %
Ratio Capital Management	*15.8 %*
Noes Beheer B.V.	*11.7 %*
Jürgen W. Krebs	*9.9 %*
Taaleritehdas	*6.8 %*

Risk Profile (WRe):	2018e
Beta:	1.6
Price / Book:	0.7 x
Equity Ratio:	81 %

High growth potential for pure player in orthopaedic trauma implants

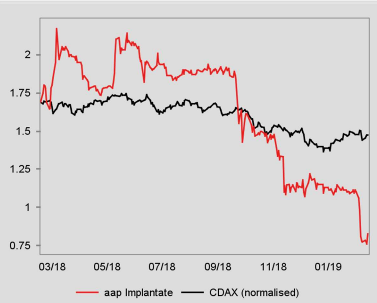
- **Hopes of double-digit growth rates were not fulfilled in 2018** as high-margin sales in North America (NA) faltered. However management has implemented measures to return to growth in NA and the initial guidance anticipates sales growth of 20-40% in 2019. Meanwhile aap is working on market approval for its potentially game-changing silver coating technology and a human clinical study is due to start in H1 2019. With the shortfall in high-margin sales in NA and the need to finance the human study, aap is currently evaluating various measures to strengthen its financial base.
- **In 2018, Trauma sales were up by only 2% y-o-y but, excluding NA, sales in this segment rose +13%:** aap reported Trauma sales of EUR 10.8m for FY 2018. Sales growth of 2% was below initial expectations (reported minus 1% due to sales related to non-recurring business). Earnings figures have not yet been released. Sales dropped by 27% in NA as aap lost certain distributors and hospitals while other distribution agreements with global partners have not yet been signed. However, NA still contributes EUR 2.2bn or 21% of sales. In contrast, there was strong growth in all other important regions: Germany +14% to EUR 2.8m and International (excl. NA) +13% to EUR 5.8m, thereof Europe excl. Germany: +17% and BRICS states: +24%.
- **Initiatives implemented for a return to growth in NA and positive outlook for 2019:** aap is confident that the measures already taken in NA will lead to positive development. In 2017, sales growth in NA amounted to 26%. In view of this, the initial guidance for 2019 calls for sales growth of between 20-40% or in total figures EUR 13.0-15.0m and EBITDA of between EUR -4.4m and EUR -2.8m.
- **Silver coating technology with game-changing potential:** The development of innovative antibacterial silver coated implants and potential partnerships could provide for further growth potential. aap is working on gaining market approval for the silver coating technology and the initiation of co-development and/or distribution agreements with global partners. An application to conduct a human clinical study for its silver coating technology was submitted to BfArM at the end of last year. Applications will also be submitted in the US and to the ethics commissions of different German federal states where the studies are to be conducted. The company aims to start the study in H1 2019.
- **aap clearly undervalued, Buy reiterated:** We derive a DCF-based FV of EUR 2 per share. An EV/sales-multiple of only 1.8x EV/sales (2019e) vs. 3.6x for the peer-group also shows a clear undervaluation of aap. Considering the high potential offered by LOQTEQ and a promising product pipeline, **we reiterate our Buy rating with a price target of EUR 2.00.**

Changes in Estimates:

FY End: 31.12. in EUR m	2018e (old)	+ / -	2019e (old)	+ / -	2020e (old)	+ / -
Sales	11.2	-3.4 %	15.1	-7.2 %	17.7	0.9 %
EBITDA	-6.4	n.m.	-3.6	n.m.	-1.4	n.m.
EBT	-7.7	n.m.	-5.5	n.m.	-3.6	n.m.
EPS	-0.19	n.m.	-0.14	n.m.	-0.09	n.m.

Comment on Changes:

- Preliminary 2018 sales figure released. No earnings reported yet.
- Our 2019 sales expectation was at the high end of initial guidance range given for sales but at the midpoint of the given EBITDA range.
- In view of the shortfall in 2018 sales to our estimate we have made some minor adjustments to our assumptions.



Rel. Performance vs CDAX:	
1 month:	-28.0 %
6 months:	-47.0 %
Year to date:	-32.9 %
Trailing 12 months:	-37.4 %

Company events:	
29.03.19	FY 2018
13.05.19	Q1
21.06.19	AGM
14.08.19	Q2

FY End: 31.12. in EUR m	CAGR (17-20e)	2014	2015	2016	2017	2018e	2019e	2020e
Sales	17.9 %	31.6	28.0	14.7	10.9	10.8	14.0	17.9
Change Sales yoy		-21.0 %	-11.4 %	-47.5 %	-25.8 %	-1.1 %	30.3 %	27.3 %
EBITDA	-	2.3	-1.9	16.0	-6.2	-6.7	-3.6	-1.8
Margin		*7.2 %*	*-6.7 %*	*109.0 %*	*-57.0 %*	*-61.8 %*	*-25.4 %*	*-9.9 %*
EBITDA adj.		2.3	-1.9	-7.9	-6.2	-6.7	-3.6	-1.8
Margin		7.2 %	-6.7 %	-53.7 %	-57.0 %	-61.8 %	-25.4 %	-9.9 %
EBIT	-	0.0	-4.9	13.7	-8.0	-8.1	-5.4	-4.1
Margin		*-0.1 %*	*-17.5 %*	*93.4 %*	*-73.3 %*	*-74.8 %*	*-38.4 %*	*-22.9 %*
Net income	-	-0.5	-5.3	14.6	-8.9	-7.9	-5.2	-3.9
EPS	-	-0.01	-0.17	0.47	-0.31	-0.27	-0.18	-0.14
DPS	-	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.
FCFPS		-0.26	-0.02	-0.30	-0.26	-0.31	-0.22	-0.16
FCF / Market cap		-7.3 %	-1.0 %	-22.5 %	-17.9 %	-37.0 %	-27.0 %	-19.4 %
EV / Sales		2.4 x	1.9 x	1.3 x	2.7 x	1.9 x	1.9 x	1.8 x
EV / EBITDA		33.5 x	n.a.	1.2 x	n.a.	n.a.	n.a.	n.a.
EV / EBIT		n.a.	n.a.	1.4 x	n.a.	n.a.	n.a.	n.a.
P / E		n.a.	n.a.	2.8 x	n.a.	n.a.	n.a.	n.a.
FCF Potential Yield		-0.4 %	-8.3 %	73.4 %	-25.9 %	-39.2 %	-19.8 %	-12.8 %
Net Debt		-7.8	-15.0	-21.5	-12.2	-3.4	3.0	7.6
ROCE (NOPAT)		n.a.	n.a.	48.8 %	n.a.	n.a.	n.a.	n.a.
Guidance:	2019: sales EUR 13.0-15.0m, EBITDA EUR -4.4 to -2.8m							

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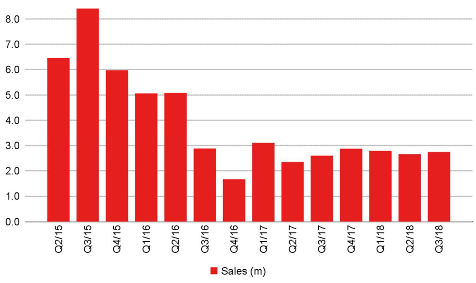
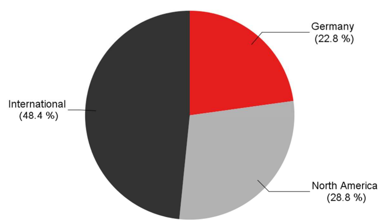
Sales development
in EUR m



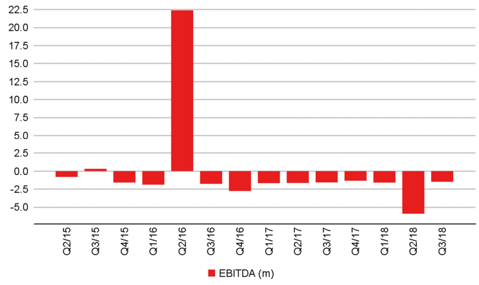
Source: Warburg Research

Sales by regions
2017; in %



Source: Warburg Research

EBITDA development
in EUR m



Source: Warburg Research

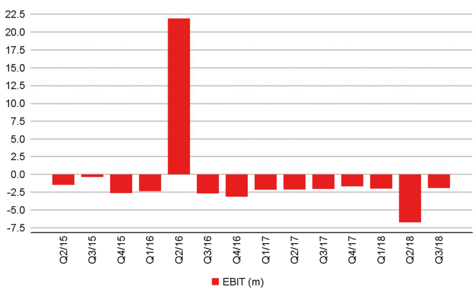
Company Background

- aap Implantate AG develops, produces and sells medical implants, which are primarily used in orthopaedics to mend fractures.
- aap Implantate AG was founded in 1990 as a MBO from the Johnson & Johnson Group and is headquartered in Berlin.
- The company covers the entire value chain and sells the products worldwide with a focus on established markets as Germany, North America as well as further European countries.
- The products are sold by direct sale, international sales partners or OEM partnerships.
- Increasing in importance are the so-called "Global Partners", larger companies interested in an agreement to distribute aap's current products (and, if approved, the silver coating technology) via their sales channels.

Competitive Quality

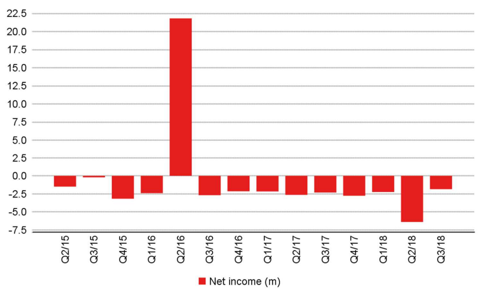
- aap Implantate AG has developed a patent protected anatomical plating system (LOQTEQ), which provides significant improvements for surgeons, hospitals and clinics as well as patients.
- Additionally aap has a promising development pipeline with an antibacterial silver coating for the implants as well as coated magnesium implants.

EBIT development
in EUR m



Source: Warburg Research

Net income development
in EUR m



Source: Warburg Research

Summary of Investment Case

Investment triggers

- **aap Implantate is well positioned to take advantage of underlying growth of 5% in the orthopaedic trauma market**. This growth rate is augmented by the extension of indication coverage (Germany +14%) and international expansion (International without North America +13%).
- **Europe** – With indication coverage of more than 90% for the treatment of major bone fractures, aap extended its customer access to major German hospital chains like Asklepios and Fresenius Helios as customers. This should guarantee sales expansion while the creditworthiness of such clients is an additional positive aspect in our view.
- **North America presents a clear opportunity** – following disappointing development in North America in 2018 management has implemented initiatives to return to growth in this important region. Earnings are set to benefit from the higher margins achievable in the North American market.
- **Silver technology - in search of the Holy Grail** – with successful CE approval for silver coating technology, aap would be able to significantly increase the quality of implants. This promising coating technology could be the first to lead to the launch of antibacterial implants. The animal study, conducted with the renowned AO Research Institute Davos, showed that the silver coating has no negative influence on bone healing, which fulfilled a central requirement of regulatory authorities. Following the submission of an application to the German authority BfArM to conduct a human clinical study, the next step will be the submission of applications in the US. The company is aiming to start the study in H1 2019. We expect a duration of at least 24 months for the trial plus the read-out of the data, which would imply a market launch at the beginning of 2022.

Valuation

- DCF model, including successful development of silver coating technology, suggests a fair value per share of EUR 2.00
- A peer group of orthopaedic trauma companies implies a FV of approx. EUR 1.70 based on EV/sales multiples (2019e).

Growth

- **Double-digit growth rates expected** – While development in North America was disappointing in 2018 and depressed overall revenues, we attribute this dip to temporary distribution issues and expect the company to gain traction again. We expect double-digit growth to continue from 2019 onwards driven by increasing sales in established markets and entry to new markets. In a best-case scenario, royalties for out-licensing the innovative silver technology are to be expected.
- **Strict focus on the further roll-out of LOQTEQ and improvement in the indication coverage** should propel the company to breakeven (on EBITDA-level). Including silver licensing, an EBITDA margin of 25% on sales in excess of EUR 40m is targeted by management within the next three to four years.

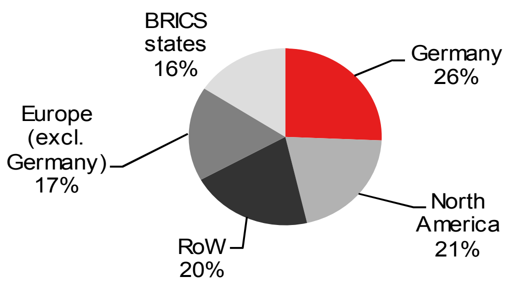
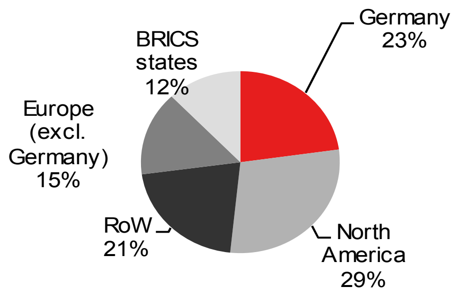
Competitive quality

- **IP-protected product portfolio:** aap Implantate has developed a patent-protected anatomical plating system (LOQTEQ), which provides significant advantages for surgeons, hospitals, and patients. A major milestone was the expansion of the indication coverage to more than 90% for the treatment of major bone fractures.
- **Promising development pipeline** includes an antibacterial silver coating for the implants as well as coated magnesium implants. By the end of 2017, the company had already invested some EUR 2.9m in these developments. Currently, the focus is on the silver coating technology but both technologies are perceived to be platform technologies with a broad range of applications.
- **Pricing** points are below those of competitors, as the company is aiming to gain market share.

Investment risks

- **Liquidity position:** Due to the shortfall in high-margin sales in North America and the continued need to finance the human study aap is currently evaluating various measures to strengthen its financial base.
- **LOQTEQ:** aap's top-line prospects depend, to a great extent, on the acceptance of the LOQTEQ product line by surgeons.
- **Volatility of sales development in emerging markets:** In the past (2015 and 2016), the company generated a high proportion of sales in emerging markets. Specific developments in certain markets, however, led to the reduction or cancellation of orders by several distributors.
- **Silver technology:** Delays in the human clinical study or an unsatisfactory clinical outcome.

Company Overview

Products	LOQTEQ	Standard plates	Cannulated Screws
			
Pipeline	Antibacterial silver coating technology for implantable medical devices; resorbable magnesium implants		
Trauma sales FY 2018	EUR 10.8m		
EBITDA	Breakeven expected at sales of between EUR 20-22m		
Target markets	Germany, Europe, North America		
Distribution	Direct sales; distributors; OEM partnerships		
Sites	Headquarters and production are located in Berlin		
History	Foundation 1970, MBO in 1990, IPO in 1999		
Competitors	DePuySynthes, Zimmer Biomet, Smith & Nephew, Nuvasive, Königsee Implantate GmbH		
Sales by regions 2018 vs. 2017			

Source: Warburg Research

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Investment Case

- Well positioned to take advantage of above-market growth with patent-protected anatomical plating system (LOQTEQ)
- EBITDA breakeven expected on revenue of approx. EUR 20-22m
- Promising development pipeline
- Overall, we regarded aap as an innovative medical device company with a competitive product portfolio.

Innovative medical device company

Product innovation with strong growth

Since the current management took over in 2009, the company has been narrowing its focus to concentrate on innovative orthopaedic trauma implants to mend bone fractures. The broad product portfolio of subsidiaries was reduced and disposable resources invested in the development of the LOQTEQ plating system. LOQTEQ “Locking Technology” is a patented evolution of the “LCP” implant (Locking Compression Plate), which is offered by aap’s biggest competitor DePuy Synthes. LOQTEQ was launched in Q4 2011. The company also has a patented development pipeline, such as the silver coating technology for implants. We expect a launch of the silver coated implants in 2022.

Visibility constantly increasing – pure player in trauma

In line with its strategy of intensifying its focus on orthopaedic trauma, the company divested unrelated activities and sold its Biomaterials business, and a 33%-stake in aap Joints GmbH in 2016. Proceeds gained from the sale of both subsidiaries (total cash inflow EUR 34.3m) have been and will be invested in the accelerated rollout of LOQTEQ and in the further development of the antibacterial silver coating technology and the coated magnesium implant.

aap’s total cash holdings amounted to EUR 10.3m at the end of September 2018 vs. EUR 17.1m at the end of 2017 (equity ratio 83%), and its management is pursuing transparent strategies. With its strict focus on becoming a producer of osteosynthetic implants (implants that do not remain in the body, thus greatly reducing risk), the company is aiming for greater international presence.

Positive development is expected from innovative LOQTEQ product line

- The latest LOQTEQ product generation has been marketed since Q4 2011 and is now available in more than 20 countries. The immediate acceptance of the product in important markets such as Germany and North America (EUR 2.2m sales built from scratch in 2015) illustrates the quality of the implants and aap’s growth potential.
- In the past, aap set out a clear strategy which was based on the emerging markets within the BRICS and SMIT countries. However, headwinds in emerging markets, especially in 2015, led to decreasing sales contributions and prompted a change in aap’s strategy to focus on established markets such as as North America, Germany and further European countries.
- With the change in strategic focus, North America is now regarded as the main growth driver. Increased sales activities in North America and the expansion of the product portfolio (approval of further plating systems), are expected to result in rising sales contributions.
- The company is expected to reach breakeven on revenue of approx. EUR 20-22m. aap is aiming for an EBITDA margin of approx. 25% in the mid-term (incl. silver licensing) but peers achieve EBITDA margins in excess of 30% for comparable products.
- aap’s promising development pipeline includes an antibacterial silver coating, and an absorbable magnesium implant (beyond 2022).

Financials

- A mere 2% sales growth in 2018 explained by shortfall in North America
- However, strong growth of 13% outside North America confirms business case
- Initial 2019 guidance calls for sales growth of more than 20%
- Preliminary sales figures reported for 2018 but no earnings figures yet

Strong growth of 13% outside North America confirms business case

Current business development

Preliminary 2018 sales and initial guidance for 2019

For FY 2018, aap reported preliminary sales of EUR 10.8m for continued operations (pure trauma), an increase of ~2% y-o-y. This is below the initial guidance given in early 2018 for sales of EUR 13-15m, which was revised in early November. The shortfall is attributable to the development in North America, where aap lost certain distributors and hospitals and has not yet signed other distribution agreements with global partners. Sales in the region dropped by 27% to EUR 2.2m from EUR 3.1m, dashing hopes of higher growth rates for group sales.

Strong growth of 13% outside North America in 2018

In contrast, all other regions continued to deliver strong growth. In established markets, like Germany and Europe excluding Germany, sales increased by 14% and 17% to EUR 2.8m and EUR 1.9m respectively. There was an even stronger increase in sales in BRICS states of 32% to EUR 1.7m, due in part to new customer wins, e.g. in South Africa and Chile. Sales excluding North America made a total contribution of 79% to Trauma sales, growing on average by an impressive 13%. Earnings have not yet been reported. Detailed FY results are due to be released on March 29.

Sales by regions

	2016	2017	2018 pre	2019e	2020e	2021e	2022e
Trauma	8.877	10.648	10.816	14.045	17.877	21.856	25.428
- y-o-y	---	20%	2%	30%	27%	22%	16%
Germany	2.352	2.428	2.774	3.329	3.928	4.242	4.497
	---	3%	14%	20%	18%	8%	6%
North America	2.436	3.071	2.240	3.695	5.453	7.335	8.802
	---	26%	-27%	65%	48%	35%	20%
International	4.089	5.149	5.802	7.020	8.495	10.279	12.129
	---	26%	13%	21%	21%	21%	18%
Discontinued activities	1.609	254	-38				
Silver Coating Technology				0	0	0	5.000
Total sales, in EUR th	10.486	10.903	10.778	14.045	17.877	21.856	30.428
- y-o-y	---	4%	-1%	30%	27%	22%	39%

Source: Warburg Research

Targeted 20% annual revenue growth is achievable

Management anticipates annual revenue growth of at least 20% for the next couple of years. This impressive top-line growth rate includes more than 6% annual growth for the mainstream trauma business and additional growth from the expansion of coverage to the foot & ankle, with growth rates of more than 8%, while regional expansion should secure the remainder. Initial 2019 guidance calls for sales growth of 20-40% or in monetary terms EUR 13-15m (WRe: EUR 14.0m) and EBITDA of between EUR -4.4m and EUR -2.8m (WRe: -3.6m).

Growth scenario based on successful roll-out in North America

In our scenario, we assume that aap could achieve a sales level of approx. EUR 22m by 2021. This scenario does not include a contribution from the silver coating technology.

- Our scenario foresees growth rates of above 20% for the coming years. This is a level already achieved in 2017. With low double-digit percentage sales growth in Germany and the rest of Europe in 2019, an important driver will be international roll-out, especially in the North American market. BRICS states, like South Africa, offer the potential to contribute significantly to sales, as shown in 2018 (+32% y-o-y). To fulfil hopes pinned on NA it requires for example two orders from global partners in the range of EUR 0.5m each in 2019 and further three orders in 2020.
- In a best case scenario, successful development of the silver coating technology would contribute to the top and bottom line. Assuming aap enters a development and sales agreement with a major company, aap could receive royalties of between 3-5% of sales (WRe: 5%). In absolute numbers, this would result in up to EUR 10m annual royalty payments from 2021/2022 onwards.

Breakeven expected on a sales level of above EUR 20m

The ramp-up of trauma activities, including initial costs for distribution networks e.g. in North America, mean these activities will remain loss-making in the short term. Development costs and expenses for regulatory processes will also weigh on earnings. In view of this, management targets breakeven at a sales volume of EUR 20-22m.

Margins and earnings set to benefit from increased North America sales

The expected sales growth in North America will have a direct impact on earnings as the profit margin in this region is higher than in Germany/Western Europe. Economies of scale should drive earnings further as personnel and overhead costs are more or less fixed. Potential contributions from an agreement on silver technology should then lead to a clear improvement in the EBITDA margin towards the 25% anticipated by management within three to four years. Including silver licensing, an EBITDA margin of above 20% on sales of above EUR 40m seems achievable within the next 4 years.

Liquidity position melting down

The latest available detailed earnings figures were the 9M-results published in mid-November 2018. Cash and cash equivalents fell in the first nine months of 2018 to EUR 7.3m at the end of September compared to EUR 13.3m at the end of 2017. Including the liquidity holdings reported under current and non-current other financial assets, the total cash holdings amounted to EUR 10.3m at the end of September 2018 (ultimo 2017: EUR 17.1m).

The liquidity position is clearly constrained by several factors. The P&L is burdened by higher personnel costs to meet stricter regulatory requirements (quality assurance measures) and to proceed with the development of the silver coating technology. At the end of Q3 a total of 154 people were employed compared to 141 at the end of 2017.

Even more important are the continued investments in the development of the silver coating technology. Until the end of 2017 aap invested more than EUR 7.8m in the development of its innovative products. In the 9M 2018 period, investments in development projects amounted to EUR 1.7m (year earlier: EUR 0.9m). Investments in property, plant and equipment receded by EUR 0.2m to EUR 0.4m. We expected that investment of a further EUR 4m is necessary to perform the human clinical study and to proceed with the filings.

However, in our view, the more unfavourable market mix with the temporary reduction in the share of high-margin US sales means that earnings have not developed as planned to finance the higher development costs. Hopes are pinned on a recovery of the North American business as reflected in the outlook. This would allow aap to achieve a sales level necessary to break even at operating level. In the meantime, the marketing effort and the human study have to be financed.

Evaluating various options to strengthen financial base

The company has said that it is currently evaluating various measures to strengthen its financial base to finance the planned human clinical study and the planned sales growth. This includes technology-related transactions (out-licensing of technologies, JV agreements), debt capital measures or equity instruments (cash capital increase or convertible bonds).

Review: divestment of Biomaterials to focus on Trauma and to finance pipeline development

As part of the company's strategy to intensify its focus on orthopaedic trauma and to finance the development costs of its coating technologies, the Biomaterials activities were sold in 2016. The business unit comprised the production of bone cement and filling materials. With a cash inflow of approx. EUR 34m the sale of the asset put aap in a solid liquidity situation.

After the sale of the non-core business areas, which represented approx. 50% of sales, the company decided to distribute a part of the liquid funds to shareholders with a shareholder-friendly share buyback programme (offer price: EUR 1.52 per share). aap returned over EUR 3.4m to shareholders in mid-2017.

Valuation

- DCF model points to a fair value of approx. EUR 2.00 if the silver coating technology is successfully developed and marketed
- Sum-of-the parts valuation: Excluding the silver coating technology we derive a DCF-value of EUR 1.50 per share. This is also far higher than the current share price level
- Substantial discount to peers based on EV/sales-multiples

aap clearly undervalued

DCF model

The price target of EUR 2.00 is derived from a DCF model. Structural market growth of 6% provides a solid underlying basis while the launch of new product lines and regional expansion should provide additional growth potential.

The DCF model is based on the following assumptions:

Revenue growth of more than 20% by 2021, as a result of

- underlying market growth of up to 6%
- expansion into new applications
- ongoing international expansion into established markets like North America

An out-licensing deal for the innovative silver technology would deliver additional growth momentum.

The long-term growth rate of 2.5% is below current total trauma market growth and therefore represents a conservative reflection of the long-term growth potential.

Proportionately stronger earnings growth assumed:

- The gross profit margin will be positively impacted by increasing sales in higher-margin regions like North America.
- Increasing sales and relatively stable fixed costs (personnel expenses mainly) will leverage the margin.
- Potential royalty payments from out-licensing the innovative silver coating technology will have a direct positive impact on earnings.
- The company expects to achieve breakeven at operating level (EBITDA) with sales of between EUR 20m to EUR 22m.
- A long-term tax rate of 28% is assumed.
- A beta of 1.6 leads to weighted costs of capital of 9.8%.

Result: The DCF model yields a fair value of approx. EUR 2.00 per aap share.

DCF model

Figures in EUR m	Detailed forecast period 2018e	2019e	2020e	Transitional period 2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e	Term. Value
Sales	10.8	14.0	17.9	21.9	30.4	39.2	42.5	45.4	48.3	51.0	53.7	56.2	58.4	
Sales change	*-1.1 %*	*30.3 %*	*27.3 %*	*22.3 %*	*39.2 %*	*28.8 %*	*8.5 %*	*6.8 %*	*6.4 %*	*5.5 %*	*5.3 %*	*4.7 %*	*4.0 %*	*2.5 %*
EBIT	-8.1	-5.4	-4.1	-1.9	2.3	5.2	6.2	7.2	8.1	9.0	9.9	11.7	12.2	
EBIT-margin	*-74.8 %*	*-38.4 %*	*-22.9 %*	*-8.6 %*	*7.5 %*	*13.1 %*	*14.7 %*	*15.8 %*	*16.9 %*	*17.7 %*	*18.5 %*	*20.8 %*	*20.8 %*	
Tax rate (EBT)	*1.3 %*	*1.9 %*	*2.5 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	
NOPAT	-8.0	-5.3	-4.0	-1.4	1.6	3.7	4.5	5.2	5.9	6.5	7.1	8.4	8.8	
Depreciation	1.4	1.8	2.3	2.7	3.5	4.1	4.0	3.7	3.5	3.2	2.7	2.2	1.8	
in % of Sales	*13.0 %*	*13.0 %*	*13.0 %*	*12.3 %*	*11.4 %*	*10.4 %*	*9.3 %*	*8.2 %*	*7.3 %*	*6.3 %*	*5.0 %*	*4.0 %*	*3.0 %*	
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	
Change in Liquidity from														
- Working Capital	-0.4	1.3	1.3	-1.2	0.8	3.5	1.3	1.2	1.2	1.1	1.1	1.0	0.9	
- Capex	2.7	1.7	1.7	2.1	2.1	2.1	2.0	2.0	1.9	1.7	1.7	1.7	1.8	
Capex in % of Sales	*25.3 %*	*12.3 %*	*9.7 %*	*9.6 %*	*6.8 %*	*5.2 %*	*4.8 %*	*4.3 %*	*3.9 %*	*3.4 %*	*3.2 %*	*3.0 %*	*3.0 %*	
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)	-8.9	-6.5	-4.7	0.5	2.2	2.2	5.1	5.8	6.4	6.9	7.0	8.0	7.8	9
PV of FCF	-9.0	-6.0	-4.0	0.4	1.6	1.4	3.0	3.1	3.1	3.0	2.8	2.9	2.6	41
share of PVs	-41.81 %			52.32 %										89.49 %

Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	15.00 %	Financial Strength	2.40
Cost of debt (after tax)	6.8 %	Liquidity (share)	1.80
Market return	7.00 %	Cyclicality	1.20
Risk free rate	1.50 %	Transparency	1.40
		Others	1.20
WACC	**9.77 %**	**Beta**	**1.60**

Valuation (m)

Present values 2030e	5
Terminal Value	41
Financial liabilities	1
Pension liabilities	0
Hybrid capital	0
Minority interest	0
Market val. of investments	0
Liquidity	13
Equity Value	**58**
No. of shares (m)	28.6
Value per share (EUR)	**2.01**

Sensitivity Value per Share (EUR)

		Terminal Growth						
Beta	WACC	1.75 %	2.00 %	2.25 %	**2.50 %**	2.75 %	3.00 %	3.25 %
1.81	10.8 %	1.56	1.59	1.62	1.66	1.69	1.73	1.77
1.71	10.3 %	1.71	1.75	1.78	1.82	1.86	1.91	1.96
1.65	10.0 %	1.79	1.83	1.87	1.91	1.96	2.01	2.06
1.60	9.8 %	1.88	1.92	1.96	**2.01**	2.06	2.12	2.17
1.55	9.5 %	1.97	2.02	2.06	2.12	2.17	2.23	2.30
1.49	9.3 %	2.07	2.12	2.17	2.23	2.29	2.36	2.43
1.39	8.8 %	2.29	2.35	2.42	2.49	2.56	2.65	2.74

		Delta EBIT-margin						
Beta	WACC	-1.5 pp	-1.0 pp	-0.5 pp	**+0.0 pp**	+0.5 pp	+1.0 pp	+1.5 pp
1.81	10.8 %	1.48	1.54	1.60	1.66	1.72	1.78	1.84
1.71	10.3 %	1.63	1.69	1.76	1.82	1.89	1.95	2.01
1.65	10.0 %	1.72	1.78	1.85	1.91	1.98	2.05	2.11
1.60	9.8 %	1.81	1.87	1.94	**2.01**	2.08	2.15	2.22
1.55	9.5 %	1.90	1.97	2.05	2.12	2.19	2.26	2.33
1.49	9.3 %	2.01	2.08	2.16	2.23	2.30	2.38	2.45
1.39	8.8 %	2.24	2.33	2.41	2.49	2.57	2.65	2.73

- With EUR 20m in sales, the company is expected to reach break-even (EBITDA).
- Beta is relatively high owing to the cyclicality of customers order behavior.

Peer Group Valuation

For a peer group valuation, we have taken a selection of smaller and mid-sized companies active in the field of orthopaedics. We have excluded the major players like Stryker (total sales of USD 13.6bn in 2018, thereof Trauma and Extremities +7.0% at CER to USD 1.58bn) and Zimmer Biomet (2018: USD 7.9bn) as the valuation of these large players reflects a complex and diversified portfolio.

However, a peer group valuation is rather complicated as aap does not have positive operating margins or a positive net result from continued operations. It thus makes more sense to look at sales multiples.

aap is valued at only 1.8x EV/sales (2019e) vs. 3.6x derived for the peer group, reflecting a clear undervaluation of aap. In the ongoing sector consolidation, even higher multiples of more than 5.0x have been paid for acquisition targets. Around 75% of the orthopaedic trauma market, worth nearly USD 6.9bn, is dominated by five international players and the market is consolidating. These large companies are growing at a significantly slower rate than smaller niche players within the sector which have been purchased more frequently in recent years.

Companies

Globus Medical (USA): Globus Medical is active in the field of musculoskeletal implants with a focus on spine disorders.

Integra Lifescience: Integra is offering orthopaedic devices and implants but is also active in the field of neurosurgery. The company is a leading supplier of surgical instruments to hospitals, surgery centres and alternate care sites in the US.

NuVasive (USA): NuVasive serves the global spine surgery market. Its spinal hardware product line includes implants and fixation products. Furthermore the company offers intraoperative monitoring services, disposables and biologics, all of which are used to aid spinal surgery.

Orthofix (USA): The medical device company provides reconstructive and regenerative orthopaedic and spine solutions worldwide. It offers products and services for bone growth stimulation devices that enhance bone fusion. Its Extremity Fixation Business unit offers products and solutions that allow physicians to successfully treat a variety of orthopaedic conditions unrelated to the spine while it also offers a portfolio of implant products used in surgical procedures of the spine.

Wright Medical Group N.V. (Netherlands): The Wright Medical Group is focused on surgical solutions for the upper extremities (shoulder, elbow, wrist and hand), lower extremities (foot and ankle) and biologic markets.

Peer Group Comparison

Company	LC	Price in LC	MC in LC m	EV in LC m	P / E 18e	P / E 19e	P / E 20e	EV / Sales 18e	EV / Sales 19e	EV / Sales 20e	EV / EBITDA 18e	EV / EBITDA 19e	EV / EBITDA 20e
Globus Medical	USD	46.29	3,519.0	4,015.6	28.5 x	26.9 x	24.0 x	5.7 x	5.2 x	4.8 x	16.9 x	15.0 x	13.5 x
NuVasive	USD	57.83	2,973.8	3,501.2	26.6 x	23.5 x	20.8 x	3.2 x	3.0 x	2.8 x	12.8 x	11.6 x	10.8 x
Orthofix	USD	62.58	1,184.1	1,130.3	36.1x	33.6 x	29.9 x	2.5 x	2.4 x	2.2 x	19.2 x	14.6 x	13.2 x
Wright Medical	USD	30.96	3,872.5	4,279.1	neg.	151.8 x	65.9 x	5.1x	4.5 x	4.0 x	38.0 x	26.1x	20.8 x
Integra LifeSciences	USD	50.13	4,270.1	5,496.3	21.0 x	18.9 x	16.9 x	3.7 x	3.6 x	3.4 x	15.9 x	14.5 x	13.2 x
Average					28.0 x	50.9 x	31.5 x	4.0 x	3.7 x	3.5 x	20.6 x	16.4 x	14.3 x
Median					27.5 x	26.9 x	24.0 x	3.7 x	3.6 x	3.4 x	16.9 x	14.6 x	13.2 x
aap Implantate	**EUR**	**0.76**	**21.9**	**24.9**	**neg.**	**neg.**	**neg.**	**2.3 x**	**1.8 x**	**1.4 x**	**neg.**	**neg.**	**neg.**
Valuation difference to Average					n.a.	n.a.	n.a.	75%	111%	148%	n.a.	n.a.	n.a.
Fair value per share based on Average					n.a.	n.a.	n.a.	1.41	1.72	2.05	n.a.	n.a.	n.a.

LOQTEQ innovative technology

Company & Products

Fifth generation trauma implants: LOQTEQ

Generally, bone implants can be divided into two main categories:

1) Osteosynthetic implants – are removed after the generation of the bone

2) Endoprothesis implants – remain in the body

aap is marketing osteosynthetic implants, which are generally removed after a period of nine to 24 months. In comparison to competitors, the innovative anatomical plating system LOQTEQ provides clear benefits in the handling, which are apparent during and after the operation.

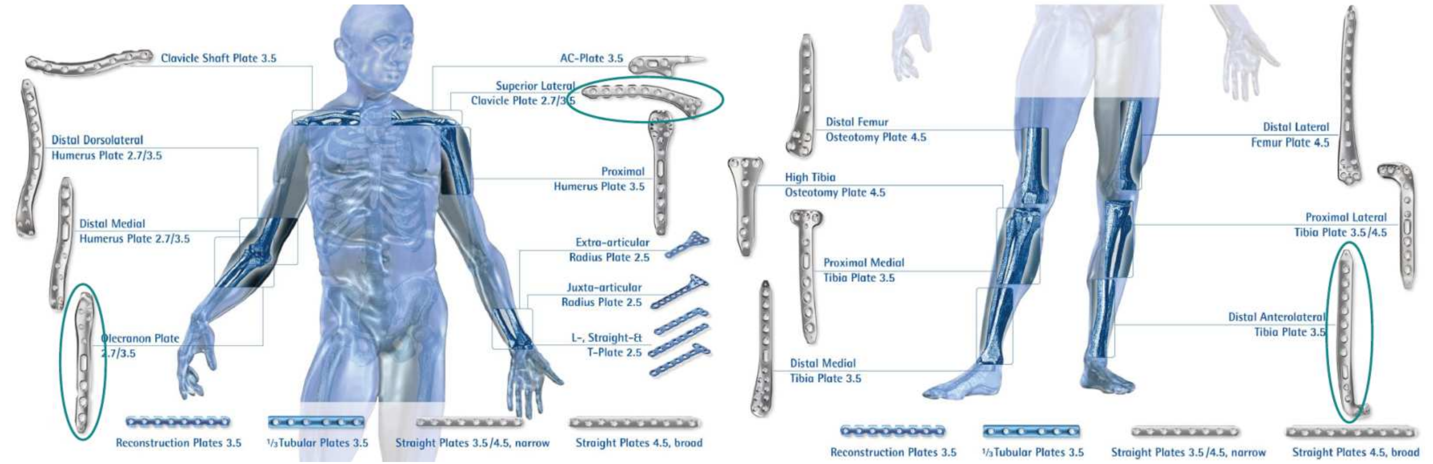
The trauma products address an orthopaedic market volume of about USD 6.1bn, which is distinguished by high growth rates. In this market, revenue of about USD 3bn is generated with screws and plate systems, like those produced by aap.

With the IP-protected portfolio, aap covers more than 90% of the indications for major bone fractures. Applications in the spine area or larger joints (shoulder, hip and knee joints) are not included as such implants remain in the body long term and therefore need to meet entirely different physical functionality and requirements.

Currently, aap's LOQTEQ portfolio is CE-certified (FDA and SFDA). This is the precondition for market authorisation in Europe, North America and China. Further plate systems recently passed the authorisation process and additional plate systems will follow, thus achieving a broader coverage.

One-stop-supplier: Only the most common applications have been represented in aap's product portfolio up to now. With the indication coverage of more than 90% for the treatment of major bone fractures, aap is and will also increasingly be classified as a full supplier by distributors and hospitals. This should lead to a higher presence and more frequent use of the products as aap should then be regarded by its clients as a one-stop supplier.

aap covers c. 90% of the relevant application areas with LOQTEQ (upper and lower extremities)



Source: Warburg Research, aap

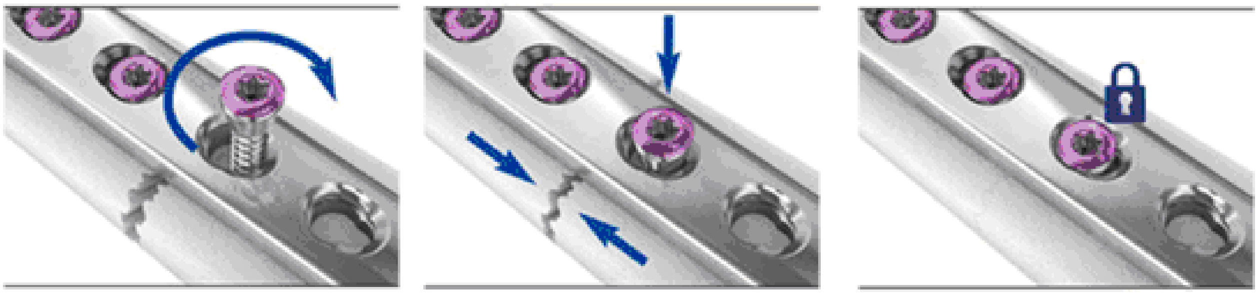
USP of LOQTEQ technology

The titanium product is closely comparable to existing products (strong dependence on the products of DePuy Synthes – market share 50%) which simplifies and accelerates the learning process for surgeons. However, the aap product is clearly distinguishable in terms of quality and price:

- LOQTEQ is oriented to the market leader but is sold for 10-15% less, which should provide for more rapid market entry.
- LOQTEQ is patent-protected and does not affect any existing patents, according to aap.
- There has been no proven occurrence of cold welding (screw head melds into the implant plate), avoiding expensive and high-risk operations.
- The handling process is simpler than that of competing products.
- LOQTEQ can close variable breakages of 0-2mm with just one screw in one bore-hole (main competitor Synthes can close a maximum breakage of 1.5mm but without the same level of flexibility and requires various screw types to do so).
- The system gives the surgeon more freedom and more flexibility.
- Comparatively straightforward handling leads to shorter operating times and, as a result, clear cost savings in hospitals.
- Faster healing and recovery means less expense for patients, hospitals and health insurance companies.

LOQTEQ shows clear advantages over the competition

aap's LOQTEQ: 1 borehole - 1 screw - variable compression (0 mm up to 2.0mm)



The pictures show a fracture which is stabilized in three steps: realigning / fixation, compression, locking.

Source: Warburg Research, aap

Product pipeline: Hopes pinned on silver coating technology

Product Pipeline

Silver coating technology with antibacterial effect

The company is presently working on the CE and FDA approval for its innovative coating technology. Besides orthopaedic implants, this technology can also be applied in other fields such as cardiology and dentistry. aap's silver coating involves covering the implant with a thin layer of silver which has an antibacterial effect and combats the colonisation of bacteria on the surface of the implant at an early stage. The precious metal has an ionising effect on the tissue surrounding the implant and reduces possible infection. This accelerates the healing process and minimises complications, which in turn dispenses with the need for follow-up operations and, ultimately, saves costs. aap's silver coating technology already has broad patent protection in important markets like North America and Europa. However, a clinical trial will be necessary to prove the effectiveness and safety of the silver-coated products. The animal study, conducted with the renowned AO Research Institute Davos, showed that the silver coating has no negative influence on bone healing, which fulfilled a central requirement of regulatory authorities. Following the submission of an application to the German Federal Institute for Drugs and Medical

Devices (BfArM) to conduct a human clinical study, the next step will be the submission of applications to the ethics commissions of different German federal states where the studies will be conducted and to the FDA in the US. The company is aiming to start the study in H1 2019. We expect such a trial to take at least 12 months plus the read-out of the data, amounting to a total of 2.5 years. In view of this we deem a market launch in 2022 as most likely.

Magnesium technology

Additionally, aap is working on coated magnesium implants which dissolve once the bone has healed and is broken down by the body. Conventional implants made of titanium or steel alloys are surgically removed after the healing process, which represents renewed strain on the patient as well as costs for the funding bodies (usually insurers).

In general, various materials have resorbable properties but aap has specialised in magnesium. Like aap's silver coating technology, the coated resorbable magnesium implant technology is a platform technology with a wide range of potential applications such as sports medicine and paediatrics.

Distribution System

aap uses various distribution channels and market strategies to address its target market. Most of the LOQTEQ products are exclusively offered under the aap brand and are expected to remain exclusive aap brand products in future against the background of the company's aim of becoming a global supplier of trauma products,

Direct sales

In Germany and in the German-speaking neighbouring countries, aap sells its products directly. Supply contracts are agreed with independent hospitals but also with hospital chains. The close contact with users means that aap can respond to the needs of the surgeons and make relevant improvements to the innovative products.

Distribution network in more than 25 countries

aap is supported by regional distributors and sales partners as part of its internationalisation strategy. An application is made in the relevant countries for a sales licence (e.g. CE certification in Germany and Europe; FDA approval in the US). Once a sales licence is granted, the previously appointed sales partners are supplied with the products. These partners are stocking partners, which means, that the sales partners stock the products and carry the risk of distribution.

Sales organisation in the US: partnerships and sales agents

In North America aap is active with its own distribution subsidiary aap Implants Inc. The order logistics are handled by a service provider based in Atlanta, Georgia. aap relies on a hybrid distribution strategy in North America. Distribution is carried out by distribution agents (stocking and non-stocking distributors) but also in partnership with global orthopaedic and medical technology companies. In 2017 the company announced a distribution agreement for its LOQTEQ Radius System with Integra LifeSciences. Unfortunately, Integra placed an initial order of only ~EUR 0.6m in 2017.

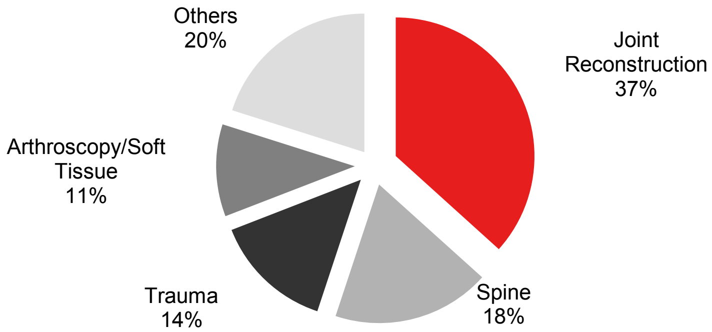
High international price points for medical products

Along with general growth trends outside of Europe, higher price points make the overseas markets more significant for aap. The world's largest market for trauma implants is the USA where a third of all relevant surgery takes place. Sales figures per trauma implant in the USA are two to three times higher than in Europe. In Japan, prices are three to four times higher. In emerging markets, prices can be as much as double the European market level. Although higher prices are shared among trading agents, aap can achieve higher margins than in the domestic market.

Trauma market, worth USD 6.9bn, grew by a healthy 4.6% in 2017

Orthopaedic trauma is specifically related to severe damage to the musculoskeletal system of a body, causing loss of function. It involves serious bone or ligament injuries, which require treatment by a specialist. Orthopaedic trauma devices play a key role in the surgical treatment of such injuries. Due to the increasing prevalence of rheumatoid arthritis and osteoarthritis as well as a rising number of accidents, severe fracture incidences are on the increase worldwide. In view of this, the global orthopaedic trauma fixation devices market has seen solid growth over the past few years. The market is estimated to be expanding at a robust mid single-digit percent CAGR. Based on the latest available data the total trauma market is estimated to be worth USD 6.9bn (end of 2017). In 2017, growth accelerated to 4.6% y-o-y (2016: +4.1%) driven by patient demographics and new products, outpacing global orthopaedic market growth. A future growth driver will be the development of innovative materials and the aim of reducing costs for healthcare systems by eliminating the need for follow-up surgery.

Global orthopaedic market 2017, value USD 49.4bn, +3.7% y-o-y

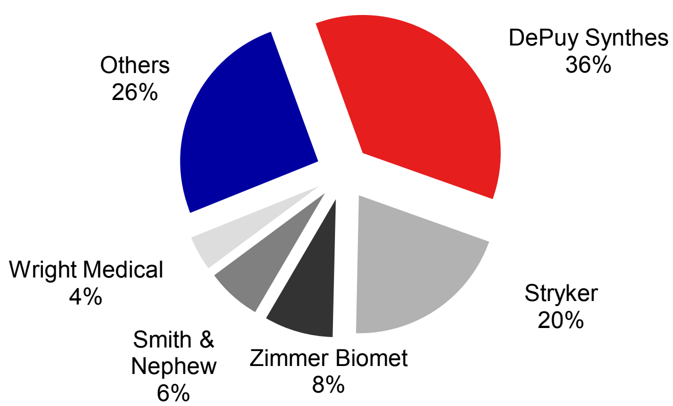


Source: Warburg Research, ORTHOWORLD

Trauma market shows robust mid single-digit percentage growth

Within the global orthopaedic market, the trauma segment accounted for 14% or approx. USD 6.9bn in 2017. Several companies are serving the combined trauma and spine market. With a market share of 36%, DePuy Synthes is the leading trauma supplier. However, other suppliers partially serve niche markets such as bone trauma implants for hands and feet or for the spine. Along with DePuy Synthes, global players such as Stryker, Zimmer Biomet, Smith & Nephew are active in the trauma sector, as well as niche suppliers such as aap Implantate or Königsee Implantate GmbH.

Trauma market – Five players dominate ~75% of the market



Source: Warburg Research, ORTHOWORLD

DCF model

	Detailed forecast period			Transitional period										Term. Value
Figures in EUR m	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e	
Sales	10.8	14.0	17.9	21.9	30.4	39.2	42.5	45.4	48.3	51.0	53.7	56.2	58.4	
Sales change	*-1.1 %*	*30.3 %*	*27.3 %*	*22.3 %*	*39.2 %*	*28.8 %*	*8.5 %*	*6.8 %*	*6.4 %*	*5.5 %*	*5.3 %*	*4.7 %*	*4.0 %*	*2.5 %*
EBIT	-8.1	-5.4	-4.1	-1.9	2.3	5.2	6.2	7.2	8.1	9.0	9.9	11.7	12.2	
EBIT-margin	*-74.8 %*	*-38.4 %*	*-22.9 %*	*-8.6 %*	*7.5 %*	*13.1 %*	*14.7 %*	*15.8 %*	*16.9 %*	*17.7 %*	*18.5 %*	*20.8 %*	*20.8 %*	
Tax rate (EBT)	*1.3 %*	*1.9 %*	*2.5 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	*28.0 %*	
NOPAT	-8.0	-5.3	-4.0	-1.4	1.6	3.7	4.5	5.2	5.9	6.5	7.1	8.4	8.8	
Depreciation	1.4	1.8	2.3	2.7	3.5	4.1	4.0	3.7	3.5	3.2	2.7	2.2	1.8	
in % of Sales	*13.0 %*	*13.0 %*	*13.0 %*	*12.3 %*	*11.4 %*	*10.4 %*	*9.3 %*	*8.2 %*	*7.3 %*	*6.3 %*	*5.0 %*	*4.0 %*	*3.0 %*	
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	
Change in Liquidity from														
- Working Capital	-0.4	1.3	1.3	-1.2	0.8	3.5	1.3	1.2	1.2	1.1	1.1	1.0	0.9	
- Capex	2.7	1.7	1.7	2.1	2.1	2.1	2.0	2.0	1.9	1.7	1.7	1.7	1.8	
Capex in % of Sales	*25.3 %*	*12.3 %*	*9.7 %*	*9.6 %*	*6.8 %*	*5.2 %*	*4.8 %*	*4.3 %*	*3.9 %*	*3.4 %*	*3.2 %*	*3.0 %*	*3.0 %*	
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)	-8.9	-6.5	-4.7	0.5	2.2	2.2	5.1	5.8	6.4	6.9	7.0	8.0	7.8	9
PV of FCF	-9.0	-6.0	-4.0	0.4	1.6	1.4	3.0	3.1	3.1	3.0	2.8	2.9	2.6	41
share of PVs	-41.81 %			52.32 %										89.49 %

Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	15.00 %	Financial Strength	2.40
Cost of debt (after tax)	6.8 %	Liquidity (share)	1.80
Market return	7.00 %	Cyclicality	1.20
Risk free rate	1.50 %	Transparency	1.40
		Others	1.20
WACC	**9.77 %**	**Beta**	**1.60**

Valuation (m)

Present values 2030e	5		
Terminal Value	41		
Financial liabilities	1		
Pension liabilities	0		
Hybrid capital	0		
Minority interest	0		
Market val. of investments	0		
Liquidity	13	No. of shares (m)	28.6
Equity Value	**58**	**Value per share (EUR)**	**2.01**

Sensitivity Value per Share (EUR)

		Terminal Growth						
Beta	WACC	1.75 %	2.00 %	2.25 %	**2.50 %**	2.75 %	3.00 %	3.25 %
1.81	10.8 %	1.56	1.59	1.62	1.66	1.69	1.73	1.77
1.71	10.3 %	1.71	1.75	1.78	1.82	1.86	1.91	1.96
1.65	10.0 %	1.79	1.83	1.87	1.91	1.96	2.01	2.06
1.60	9.8 %	1.88	1.92	1.96	**2.01**	2.06	2.12	2.17
1.55	9.5 %	1.97	2.02	2.06	2.12	2.17	2.23	2.30
1.49	9.3 %	2.07	2.12	2.17	2.23	2.29	2.36	2.43
1.39	8.8 %	2.29	2.35	2.42	2.49	2.56	2.65	2.74

		Delta EBIT-margin						
Beta	WACC	-1.5 pp	-1.0 pp	-0.5 pp	**+0.0 pp**	+0.5 pp	+1.0 pp	+1.5 pp
1.81	10.8 %	1.48	1.54	1.60	1.66	1.72	1.78	1.84
1.71	10.3 %	1.63	1.69	1.76	1.82	1.89	1.95	2.01
1.65	10.0 %	1.72	1.78	1.85	1.91	1.98	2.05	2.11
1.60	9.8 %	1.81	1.87	1.94	**2.01**	2.08	2.15	2.22
1.55	9.5 %	1.90	1.97	2.05	2.12	2.19	2.26	2.33
1.49	9.3 %	2.01	2.08	2.16	2.23	2.30	2.38	2.45
1.39	8.8 %	2.24	2.33	2.41	2.49	2.57	2.65	2.73

- With EUR 20m in sales, the company is expected to reach break-even (EBITDA).
- Beta is relatively high owing to the cyclicality of customers order behavior.

Valuation

	2014	2015	2016	2017	2018e	2019e	2020e
Price / Book	1.9 x	1.7 x	0.7 x	1.0 x	0.7 x	0.9 x	1.0 x
Book value per share ex intangibles	0.99	0.97	1.42	1.07	0.75	0.56	0.42
EV / Sales	2.4 x	1.9 x	1.3 x	2.7 x	1.9 x	1.9 x	1.8 x
EV / EBITDA	33.5 x	n.a.	1.2 x	n.a.	n.a.	n.a.	n.a.
EV / EBIT	n.a.	n.a.	1.4 x	n.a.	n.a.	n.a.	n.a.
EV / EBIT adj.*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / FCF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / E	n.a.	n.a.	2.8 x	n.a.	n.a.	n.a.	n.a.
P / E adj.*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dividend Yield	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FCF Potential Yield (on market EV)	-0.4 %	-8.3 %	73.4 %	-25.9 %	-39.2 %	-19.8 %	-12.8 %

*Adjustments made for: -

Consolidated profit & loss

In EUR m	2014	2015	2016	2017	2018e	2019e	2020e
Sales	**31.6**	**28.0**	**14.7**	**10.9**	**10.8**	**14.0**	**17.9**
Change Sales yoy	-21.0 %	-11.4 %	-47.5 %	-25.8 %	-1.1 %	30.3 %	27.3 %
Increase / decrease in inventory	2.1	3.8	1.3	-0.5	0.0	0.0	0.0
Own work capitalised	0.3	2.1	1.4	1.3	0.9	1.1	1.1
Total Sales	**34.0**	**33.9**	**17.4**	**11.7**	**11.6**	**15.2**	**18.9**
Material expenses	12.3	13.7	5.7	1.9	1.9	2.5	3.2
Gross profit	**21.7**	**20.2**	**11.6**	**9.8**	**9.7**	**12.6**	**15.7**
Gross profit margin	*68.8 %*	*72.2 %*	*79.1 %*	*89.9 %*	*90.0 %*	*90.0 %*	*88.0 %*
Personnel expenses	12.2	11.9	10.0	7.4	8.5	8.8	9.8
Other operating income	3.1	1.6	24.3	0.8	1.6	1.6	1.6
Other operating expenses	10.3	11.8	10.0	9.4	9.5	9.0	9.3
Unfrequent items	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EBITDA	**2.3**	**-1.9**	**16.0**	**-6.2**	**-6.7**	**-3.6**	**-1.8**
Margin	*7.2 %*	*-6.7 %*	*109.0 %*	*-57.0 %*	*-61.8 %*	*-25.4 %*	*-9.9 %*
Depreciation of fixed assets	0.8	1.6	1.1	1.2	0.9	1.1	1.4
EBITA	**1.5**	**-3.5**	**14.9**	**-7.4**	**-7.5**	**-4.7**	**-3.2**
Amortisation of intangible assets	1.5	0.9	1.1	0.6	0.5	0.7	0.9
Goodwill amortisation	0.0	0.5	0.0	0.0	0.0	0.0	0.0
EBIT	**0.0**	**-4.9**	**13.7**	**-8.0**	**-8.1**	**-5.4**	**-4.1**
Margin	*-0.1 %*	*-17.5 %*	*93.4 %*	*-73.3 %*	*-74.8 %*	*-38.4 %*	*-22.9 %*
EBIT adj.	**0.0**	**-4.9**	**-10.2**	**-8.0**	**-8.1**	**-5.4**	**-4.1**
Interest income	0.0	0.0	0.0	0.0	0.3	0.3	0.3
Interest expenses	0.1	0.0	0.0	0.0	0.2	0.2	0.2
Other financial income (loss)	0.0	-0.4	0.3	-1.3	0.0	0.0	0.0
EBT	**-0.2**	**-5.3**	**14.0**	**-9.3**	**-8.0**	**-5.3**	**-4.0**
Margin	*-0.6 %*	*-19.1 %*	*95.6 %*	*-85.3 %*	*-73.9 %*	*-37.6 %*	*-22.3 %*
Total taxes	0.3	0.0	-0.6	0.0	-0.1	-0.1	-0.1
Net income from continuing operations	**-0.5**	**-5.3**	**14.6**	**-9.3**	**-7.9**	**-5.2**	**-3.9**
Income from discontinued operations (net of tax)	0.0	0.0	-0.1	0.3	0.0	0.0	0.0
Net income before minorities	**-0.5**	**-5.3**	**14.6**	**-8.9**	**-7.9**	**-5.2**	**-3.9**
Minority interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net income	**-0.5**	**-5.3**	**14.6**	**-8.9**	**-7.9**	**-5.2**	**-3.9**
Margin	*-1.4 %*	*-19.1 %*	*99.2 %*	*-82.0 %*	*-72.9 %*	*-36.9 %*	*-21.8 %*
Number of shares, average	30.7	30.7	30.8	28.6	28.6	28.6	28.6
EPS	**-0.01**	**-0.17**	**0.47**	**-0.31**	**-0.27**	**-0.18**	**-0.14**
EPS adj.	-0.01	-0.17	-0.30	-0.31	-0.27	-0.18	-0.14

*Adjustments made for:

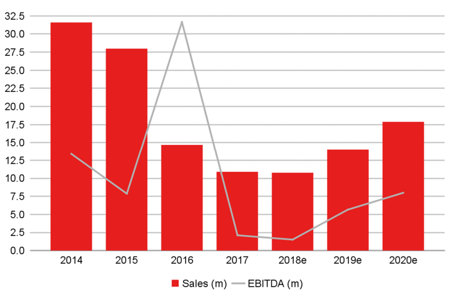
Guidance: 2019: sales EUR 13.0-15.0m, EBITDA EUR -4.4 to -2.8m

Financial Ratios

	2014	2015	2016	2017	2018e	2019e	2020e
Total Operating Costs / Sales	100.4 %	127.9 %	9.2 %	164.0 %	169.8 %	133.4 %	115.9 %
Operating Leverage	4.7 x	-922.7 x	n.a.	n.a.	-0.7 x	-1.1 x	-0.9 x
EBITDA / Interest expenses	28.8 x	n.m.	800.5 x	n.m.	n.m.	n.m.	n.m.
Tax rate (EBT)	-162.1 %	-0.2 %	-4.2 %	0.3 %	1.3 %	1.9 %	2.5 %
Dividend Payout Ratio	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Sales per Employee	213,473	156,302	94,755	75,186	74,331	96,854	123,283

Sales, EBITDA

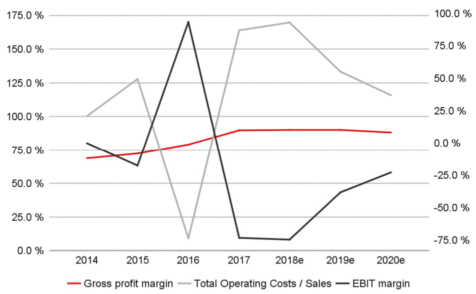
in EUR m



Source: Warburg Research

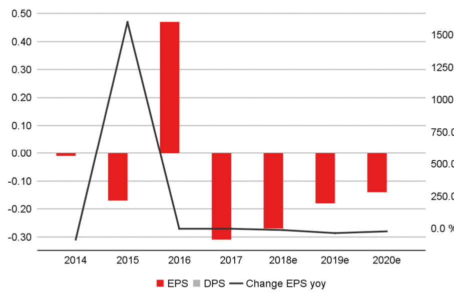
Operating Performance

in %



Source: Warburg Research

Performance per Share



Source: Warburg Research

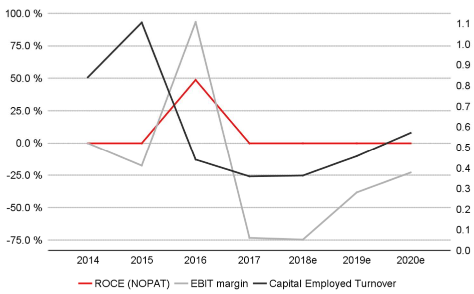
Consolidated balance sheet

In EUR m	2014	2015	2016	2017	2018e	2019e	2020e
Assets							
Goodwill and other intangible assets	15.2	10.4	11.1	11.8	11.7	11.7	11.7
thereof other intangible assets	0.5	0.5	0.1	0.1	0.0	0.0	0.0
thereof Goodwill	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Property, plant and equipment	7.7	7.7	7.6	7.2	7.1	6.7	6.0
Financial assets	1.7	0.2	0.2	0.2	0.2	0.2	0.2
Other long-term assets	0.0	0.0	1.8	1.1	1.1	1.1	1.1
Fixed assets	**24.5**	**18.3**	**20.8**	**20.3**	**20.1**	**19.7**	**19.0**
Inventories	9.4	9.7	11.1	9.6	9.5	10.8	11.9
Accounts receivable	9.3	5.5	2.9	2.5	2.2	2.8	3.6
Liquid assets	12.2	19.6	23.8	13.3	4.5	2.1	1.5
Other short-term assets	2.4	1.8	5.3	4.7	4.7	4.7	4.7
Current assets	**33.3**	**36.6**	**43.1**	**30.2**	**20.9**	**20.4**	**21.7**
Total Assets	**57.9**	**54.9**	**63.9**	**50.5**	**41.0**	**40.1**	**40.7**
Liabilities and shareholders' equity							
Subscribed capital	30.7	30.7	30.8	28.6	28.6	28.6	28.6
Capital reserve	17.6	17.6	17.5	19.9	19.9	19.9	19.9
Retained earnings	0.7	0.9	15.2	12.1	4.2	-1.0	-4.9
Other equity components	-3.6	-8.9	-8.7	-18.0	-19.6	-19.8	-19.9
Shareholders' equity	45.4	40.3	54.8	42.6	33.1	27.7	23.7
Minority interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total equity	**45.4**	**40.3**	**54.8**	**42.6**	**33.1**	**27.7**	**23.7**
Provisions	0.4	0.3	0.4	0.8	0.8	0.8	0.8
thereof provisions for pensions and similar obligations	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Financial liabilities (total)	4.3	4.6	2.3	1.1	1.1	5.0	9.0
thereof short-term financial liabilities	2.0	3.3	1.3	0.3	0.3	4.3	8.3
Accounts payable	2.9	4.1	2.5	1.8	1.7	2.3	2.9
Other liabilities	4.8	5.6	3.8	4.3	4.3	4.3	4.3
Liabilities	**12.4**	**14.6**	**9.1**	**7.9**	**7.9**	**12.4**	**17.0**
Total liabilities and shareholders' equity	**57.9**	**54.9**	**63.9**	**50.5**	**41.0**	**40.1**	**40.7**

Financial Ratios

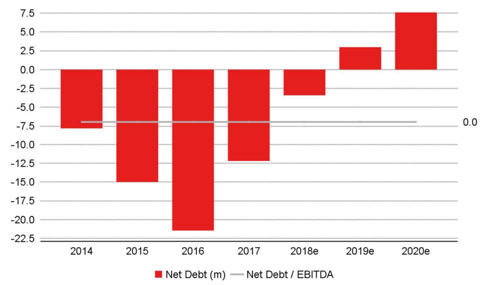
	2014	2015	2016	2017	2018e	2019e	2020e
Efficiency of Capital Employment							
Operating Assets Turnover	1.3 x	1.5 x	0.8 x	0.6 x	0.6 x	0.8 x	1.0 x
Capital Employed Turnover	0.8 x	1.1 x	0.4 x	0.4 x	0.4 x	0.5 x	0.6 x
ROA	-1.9 %	-29.2 %	70.2 %	-44.0 %	-39.2 %	-26.4 %	-20.5 %
Return on Capital							
ROCE (NOPAT)	n.a.	n.a.	48.8 %	n.a.	n.a.	n.a.	n.a.
ROE	-1.0 %	-12.5 %	30.7 %	-18.4 %	-20.8 %	-17.1 %	-15.1 %
Adj. ROE	-1.0 %	-12.5 %	-19.6 %	-18.4 %	-20.8 %	-17.1 %	-15.1 %
Balance sheet quality							
Net Debt	-7.8	-15.0	-21.5	-12.2	-3.4	3.0	7.6
Net Financial Debt	-7.9	-15.0	-21.5	-12.2	-3.4	3.0	7.6
Net Gearing	-17.2 %	-37.2 %	-39.2 %	-28.7 %	-10.3 %	10.8 %	32.0 %
Net Fin. Debt / EBITDA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Book Value / Share	1.5	1.3	1.8	1.5	1.2	1.0	0.8
Book value per share ex intangibles	1.0	1.0	1.4	1.1	0.7	0.6	0.4

ROCE Development



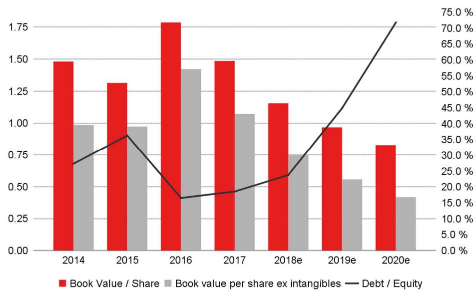
Source: Warburg Research

Net debt
in EUR m



Source: Warburg Research

Book Value per Share
in EUR



Source: Warburg Research

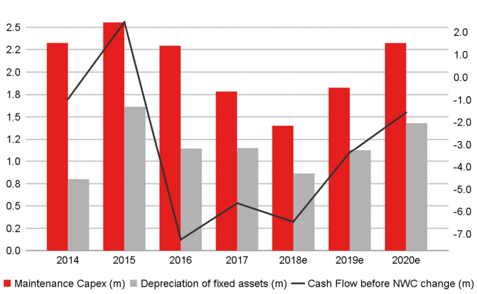
Consolidated cash flow statement

In EUR m	2014	2015	2016	2017	2018e	2019e	2020e
Net income	-0.5	-5.3	14.6	-9.3	-7.9	-5.2	-3.9
Depreciation of fixed assets	0.8	1.6	1.1	1.2	0.9	1.1	1.4
Amortisation of goodwill	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Amortisation of intangible assets	1.5	0.9	1.1	0.6	0.5	0.7	0.9
Increase/decrease in long-term provisions	0.2	0.0	0.4	0.3	0.0	0.0	0.0
Other non-cash income and expenses	-3.0	4.8	-24.6	1.5	0.0	0.0	0.0
Cash Flow before NWC change	**-1.0**	**2.5**	**-7.2**	**-5.6**	**-6.5**	**-3.4**	**-1.6**
Increase / decrease in inventory	-2.0	0.0	0.1	0.1	0.1	-1.3	-1.1
Increase / decrease in accounts receivable	0.0	0.0	0.0	0.0	0.3	-0.6	-0.8
Increase / decrease in accounts payable	0.0	0.0	0.0	0.0	-0.1	0.6	0.6
Increase / decrease in other working capital positions	0.0	0.0	-0.1	0.1	0.0	0.0	0.0
Increase / decrease in working capital (total)	-2.0	0.0	0.0	0.2	0.4	-1.3	-1.3
Net cash provided by operating activities [1]	**-2.9**	**2.5**	**-7.2**	**-5.4**	**-6.1**	**-4.7**	**-2.9**
Investments in intangible assets	-2.0	0.0	-1.0	-1.3	-2.0	-1.0	-1.0
Investments in property, plant and equipment	-1.2	-3.1	-1.0	-0.7	-0.7	-0.7	-0.7
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	18.3	0.1	31.9	0.5	0.0	0.0	0.0
Net cash provided by investing activities [2]	**13.2**	**-3.1**	**29.8**	**-1.5**	**-2.7**	**-1.7**	**-1.7**
Change in financial liabilities	-0.6	-1.1	-2.3	-1.4	0.0	4.0	4.0
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	-3.4	0.0	0.0	0.0
Capital measures	0.0	0.2	0.0	0.1	0.0	0.0	0.0
Other	0.0	-1.0	-2.3	1.2	0.0	0.0	0.0
Net cash provided by financing activities [3]	**-0.6**	**-1.9**	**-4.6**	**-3.5**	**0.0**	**4.0**	**4.0**
Change in liquid funds [1]+[2]+[3]	**9.7**	**-2.5**	**18.1**	**-10.5**	**-8.8**	**-2.4**	**-0.6**
Effects of exchange-rate changes on cash	0.0	0.0	0.8	0.0	0.0	0.0	0.0
Cash and cash equivalent at end of period	12.2	9.7	23.8	13.3	4.5	2.1	1.5

Financial Ratios

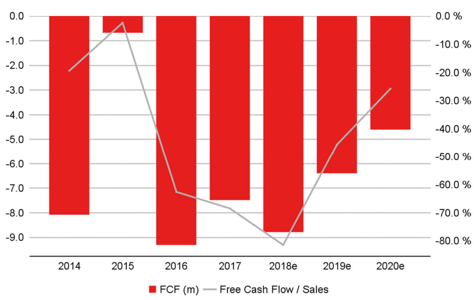
	2014	2015	2016	2017	2018e	2019e	2020e
Cash Flow							
FCF	-8.1	-0.7	-9.3	-7.5	-8.8	-6.4	-4.6
Free Cash Flow / Sales	-19.4 %	-2.4 %	-62.7 %	-68.6 %	-81.5 %	-45.5 %	-25.7 %
Free Cash Flow Potential	-0.3	-4.4	14.3	-7.6	-8.0	-5.3	-4.0
Free Cash Flow / Net Profit	1347.6 %	12.7 %	-63.1 %	83.6 %	111.7 %	123.3 %	118.2 %
Interest Received / Avg. Cash	0.0 %	0.0 %	0.1 %	0.0 %	3.4 %	9.1 %	17.0 %
Interest Paid / Avg. Debt	1.8 %	0.8 %	0.6 %	2.8 %	18.5 %	6.5 %	2.8 %
Management of Funds							
Investment ratio	10.1 %	11.2 %	13.6 %	18.8 %	25.3 %	12.3 %	9.7 %
Maint. Capex / Sales	7.4 %	9.1 %	15.6 %	16.4 %	13.0 %	13.0 %	13.0 %
Capex / Dep	137.6 %	103.9 %	87.2 %	114.8 %	195.0 %	94.9 %	74.5 %
Avg. Working Capital / Sales	46.5 %	48.0 %	76.8 %	100.2 %	94.7 %	75.8 %	66.8 %
Trade Debtors / Trade Creditors	315.3 %	134.5 %	115.5 %	145.1 %	129.4 %	121.7 %	124.1 %
Inventory Turnover	1.3 x	1.4 x	0.5 x	0.2 x	0.2 x	0.2 x	0.3 x
Receivables collection period (days)	107	72	73	85	75	73	74
Payables payment period (days)	88	109	162	342	320	332	329
Cash conversion cycle (Days)	299	221	614	1,619	1,542	1,300	1,094

CAPEX and Cash Flow
in EUR m



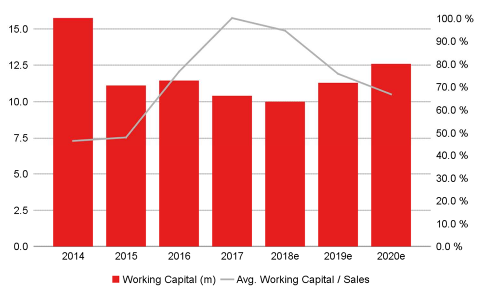
Source: Warburg Research

Free Cash Flow Generation



Source: Warburg Research

Working Capital



Source: Warburg Research

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This report has been made accessible to the company analysed.

Company	Disclosure	Link to the historical price targets and rating changes (last 12 months)
aap Implantate	5	http://www.mmwarburg.com/disclaimer/disclaimer_en/DE0005066609.htm

INVESTMENT RECOMMENDATION

Investment recommendation: expected direction of the share price development of the financial instrument up to the given price target in the opinion of the analyst who covers this financial instrument.

-B-	**Buy:**	The price of the analysed financial instrument is expected to rise over the next 12 months.
-H-	**Hold:**	The price of the analysed financial instrument is expected to remain mostly flat over the next 12 months.
-S-	**Sell:**	The price of the analysed financial instrument is expected to fall over the next 12 months.
"-"	**Rating suspended:**	The available information currently does not permit an evaluation of the company.

WARBURG RESEARCH GMBH – ANALYSED RESEARCH UNIVERSE BY RATING

Rating	Number of stocks	% of Universe
Buy	133	65
Hold	60	29
Sell	6	3
Rating suspended	7	3
Total	**206**	**100**

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	31	76
Hold	8	20
Sell	0	0
Rating suspended	2	5
Total	**41**	**100**

PRICE AND RATING HISTORY AAP IMPLANTATE AS OF 15.02.2019

Markings in the chart show rating changes by Warburg Research GmbH in the last 12 months. Every marking details the date and closing price on the day of the rating change.

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