

A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

THE FUTURE OF ADDITIVE MANUFACTURING: MATERIALISE'S LBO – EXIT STRATEGY & RETURNS

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Abstract

The Future of Additive Manufacturing: Materialise's LBO – Exit Strategy & Returns

This investment paper reviews the potential Leveraged Buyout of Materialise, a service provider and software producer operating in the Additive Manufacturing industry. An analysis of the company and market was conducted, facilitating the assessment of key market trends that enabled the creation of investment strategies set to improve the company in various areas and aspects. The result of this work presented Materialise as an attractive investment, with strong returns across a multitude of possible scenarios in the upcoming future.

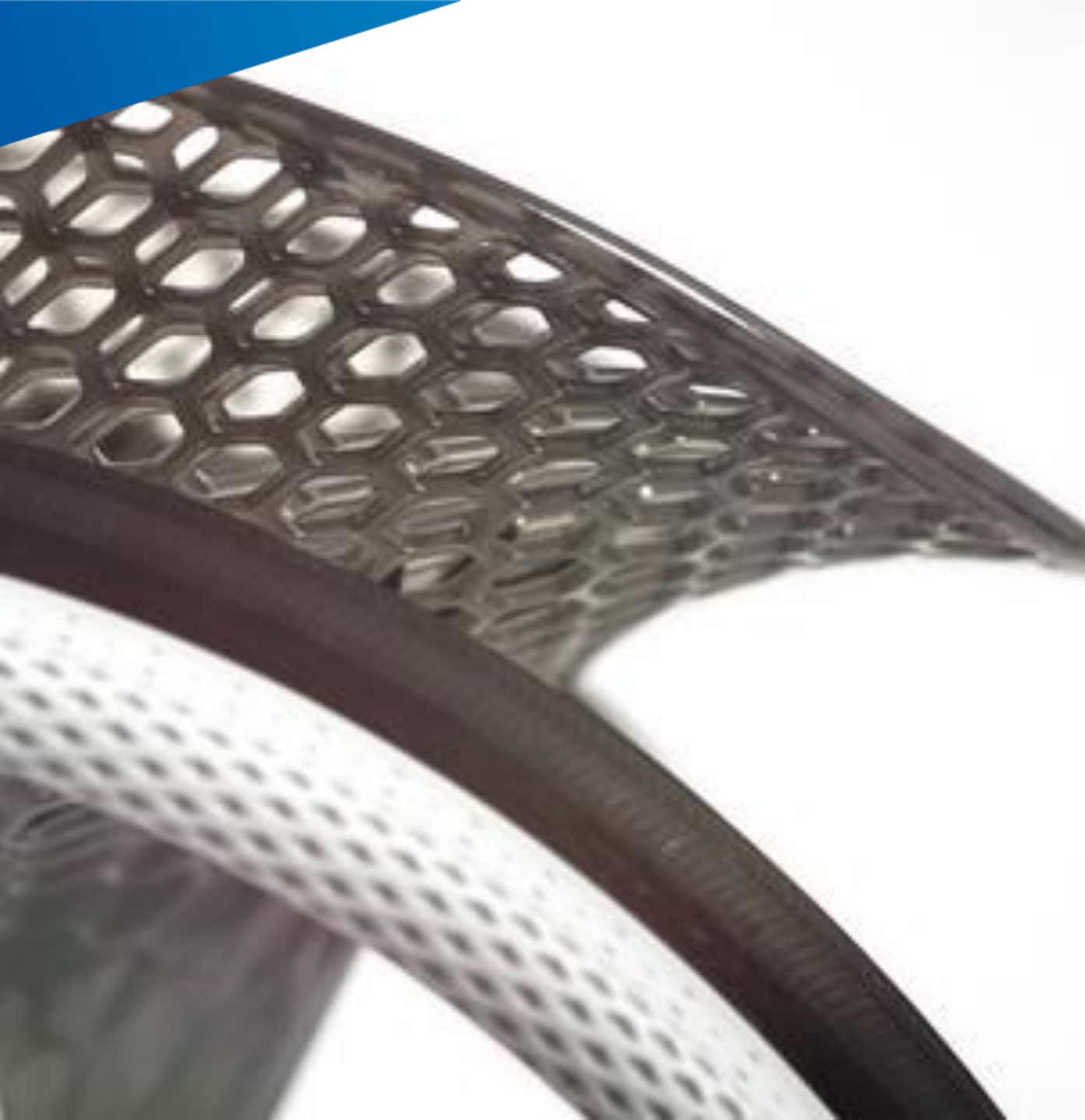
Keywords

3D Printing, Additive Manufacturing, Materialise, Stratasys

Disclaimer

This report was developed for academic purposes, using non-verified publicly available information. As so, we take no responsibility for any action that might derive from the use of this paper for anything other than information.

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Group Paper

Executive Summary

Company Overview

Materialise NV (NASDAQ: MTLN) is a **global provider** of software tools, medical solutions and sophisticated 3D printing services in the Additive Manufacturing (AM) market.

Incorporated in 1990 and headquartered in Leuven, Belgium, Materialise currently has over 2,000 employees and is present in **over 20 countries**.

The company is subdivided in three main segments: **Manufacturing, Software** and **Medical**, which combined offer products to over 8 different industries, including: Automotive, Aerospace, Consumer goods, Healthcare, Machinery, among others.

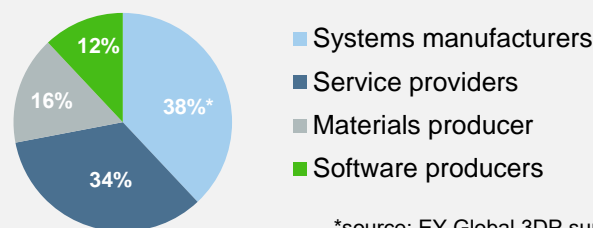
Deal Rationale

- 1 **Strong Competitive Positioning**
Pioneer in 3DP, global reach and disruptive tech.
- 2 **Successful Acquisition History**
6 acq. in the past decade with successful integration
- 3 **Growing Market**
7-Year CAGR estimates vary between 18% to 27%
- 4 **Strong Financials**
Increasing profitability and operating efficiency
- 5 **Highly Skilled Workforce**
3DP expertise both in management and engineering

Market Overview

The Additive Manufacturing market is divided into four industries. Within this division, Materialise is both a **software vendor** and a **service provider**. The overall AM market is estimated to grow from \$10.4bn in 2019 to **\$45.7bn** in 2027 at a **CAGR of 20.3%**.

Share of Companies by Industry

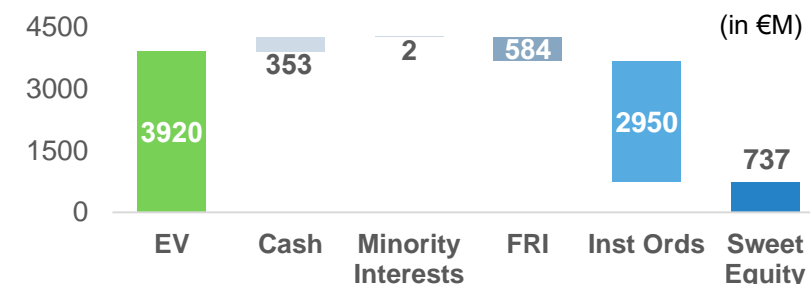


*source: EY Global 3DP survey 2019

Exit Strategy & Returns

Materialise's transaction value (EV) is € 671M with an entry multiple of 25.1x EBITDA. The deal will be financed by 39% of Debt and 61% of Equity.

The exit will be performed in **2026**, with a multiple of 12.1x. The Fund's return is **7.0x MM** and **35% IRR**.



Value Creation Plan

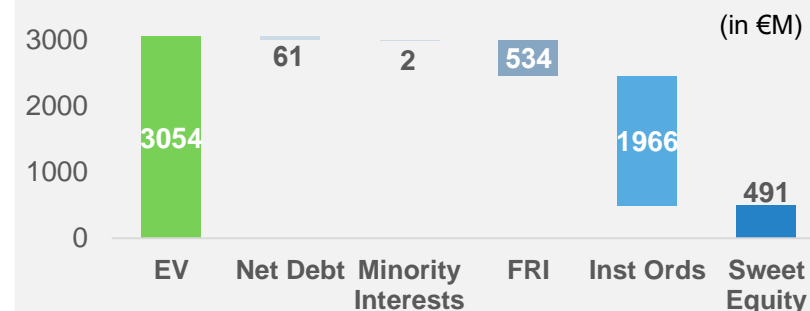
Investment thesis relies on 3 strategies to derive growth:

- A. **Organic Growth** by increasing focus in the APAC region through strategic partnerships, by strengthening Materialise's offer of metal-based printing which is a growing AM area and by expanding the customer base in the Americas and Middle East.
- B. **Optimizing Operations** by reducing SG&A and R&D costs as a result of the synergies generated by the strategic acquisition.
- C. **Strategic Acquisition** of a Systems Manufacturer to strengthen Materialise's position in the AM value chain. This vertical integration would allow the company to become an all-in-one supplier.

Contingency Plan

In case the Strategic Acquisition is not successful, a **standalone scenario** of Materialise was performed with a capital structure of 45% of debt and 55% Equity.

In this scenario, exit will occur in **2027**, with a multiple of 25.1x. The Fund's return is **5.0x MM** and **24% IRR**.



Company Overview | Company Profile & History

Company Profile

- Materialise NV (NASDAQ: MTLN) is a **global provider** of software tools, medical solutions and sophisticated 3D printing services in the Additive Manufacturing market.
- One of the largest and most long-established independent company in this sector, Materialise was incorporated on the **28th of June 1990** under the Belgian company law.
- The company currently holds **over 250 patents**, including 160 specifically related to medical applications.
- Multinational company established through a combination of **organic growth** and **acquisitions**.
- Materialise's main subsidiaries include **Engimplan**, **ACTech** and **RapidFit**



Geographical Presence



Company Description

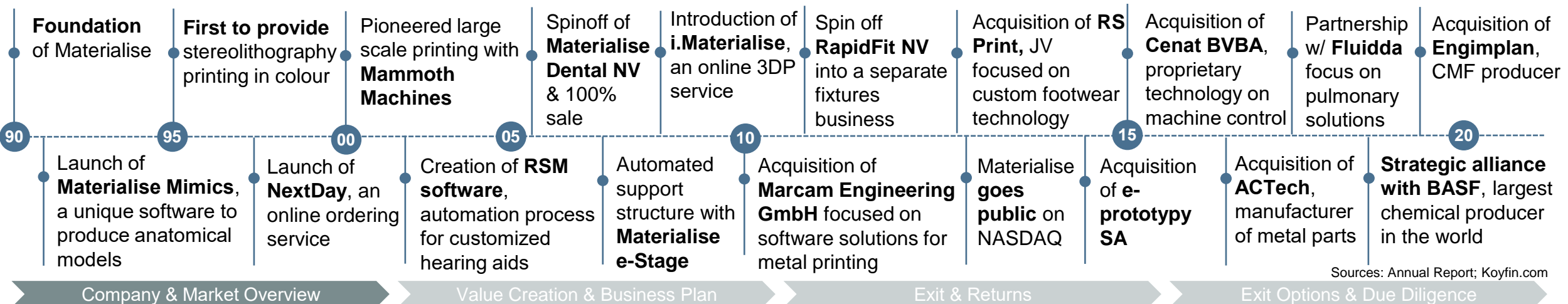
Corporate Headquarters: Leuven, Belgium

Market Segments: Manufacturing; Software; Medical

Number of Employees: 2,177

Financial Highlights (2019)

Metrics	5Y CAGR
Sales €196.7M (+ 6,5% vs. 2018)	≈ 16%
Gross Profit €109.7M (+ 7,1% vs. 2018)	≈ 15%
Net Profit €1.7M (- 43,0% vs. 2018)	n.a.
EBITDA €26.7M (+ 13,3% vs. 2018)	≈ 52%



Sources: Annual Report; Koyfin.com

Company Overview | Business Model

Manufacturing Segment

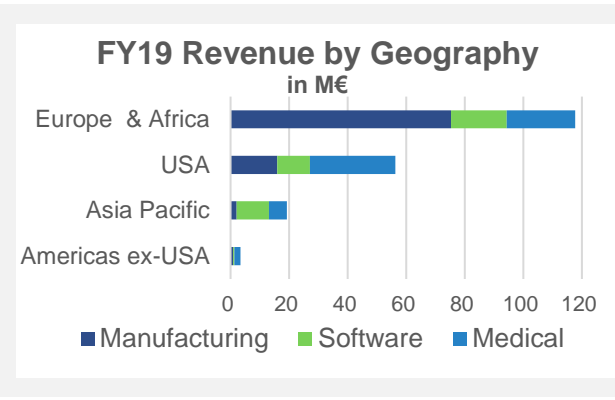
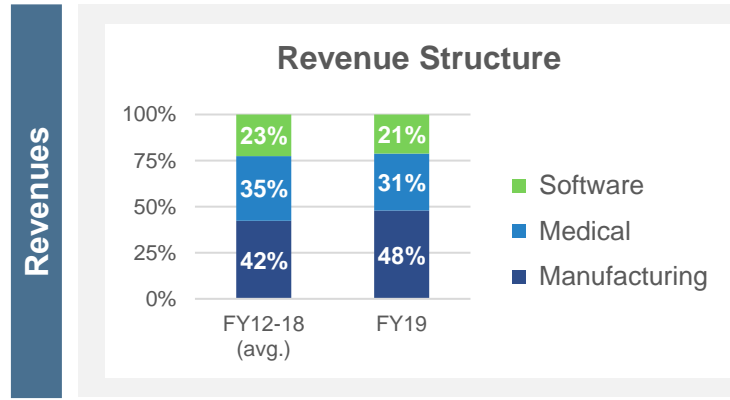
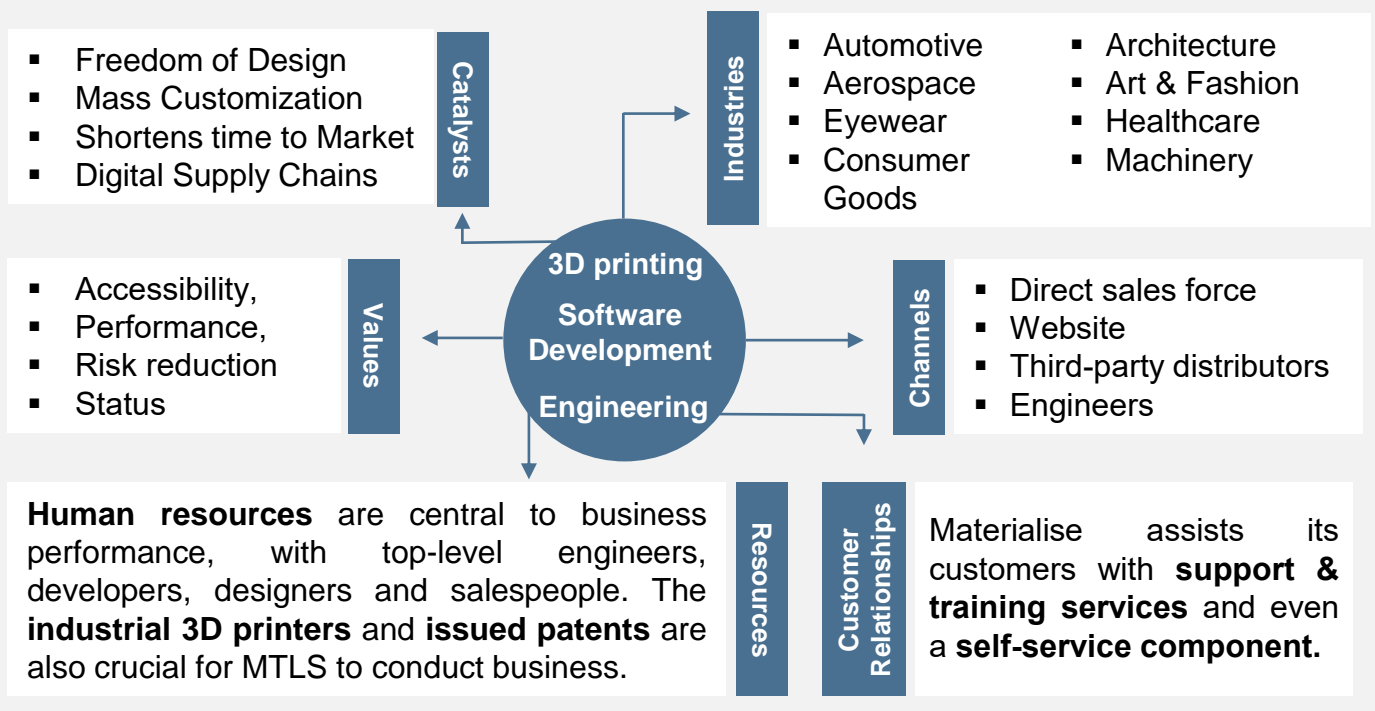
B2B service provider of **3D printing solutions through the co-creation, prototyping and consultancy services** with Materialise's engineers and designers, enabling the production of very complex parts or products using various materials and technologies, on demand.

Software Segment

Provides the necessary **sophisticated software tools** to use additive manufacturing to produce the highest standards' products regardless of complexity levels. It specializes in **workflow software** and is the backbone of 3D printing. It also provides **training and consulting services** for its products. It can also be sold as a standalone product.

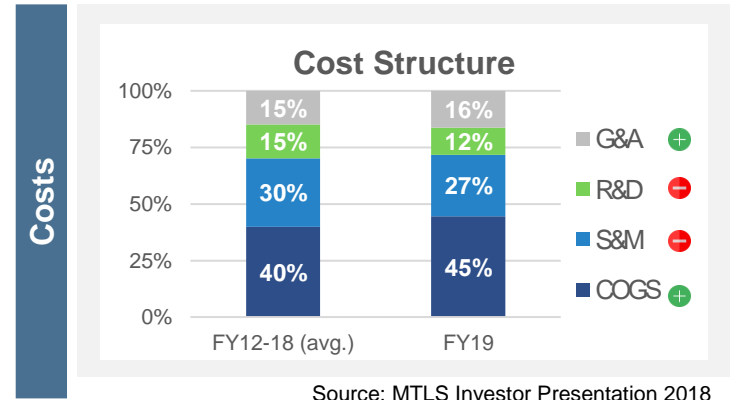
Medical Segment

Provides customers with **medical devices** printed in-house such as **surgical guides and implants, licenses to medical software packages** and **software maintenance contracts** to ensure the level of precision and accuracy required in Certified Medical Printing. Pioneering segment that revolutionizes the care for patients' lives.



Revenue is generated primarily by (i) the sale of software; (ii) 3D printed & complex manufactured products and services

Changes in revenue structure have been heavily affected by the acquisition of ACTech, boosting manufacturing's share of total revenue.



Source: MTLs Investor Presentation 2018

FY19 Highlights

Revenues
€94M

Revenue Share
48%

Growth rate
16.4%

EBITDA
€12M

EBITDA mg
13%

Employees
775 FTE

Revenue Model: The 3D Printing Process

1 Rapid Prototyping

- **Prototypes are essential** to verify the product design with a model that matches the real product, or **to perform form, fit and function** tests, in order to meet the customer's requirements.
- Rapid Prototyping allows designers and engineers to **execute fast and frequent revisions of their designs**. Thanks to a variety of available technologies and materials, 3D-printed prototypes work for both visual and functional testing.

2 Additive Manufacturing

- **Printing of 3D products** to industrial and commercial customers.
- **Co-creation:** Materialise works together with customers during the 3D printing process to solve complex design challenges and to discuss how the introduction of 3D printing can affect product development, manufacturing workflow, business models and customer experiences.
- **i.materialise:** Online service where customers can buy 3D printed products or create their own and offer them for sale to others through this platform.

3 Design and Engineering

- Services provided by highly specialized designers and CAD engineers that offer design and software support for additive manufacturing, including **remodeling and file preparation**, as well as **3D scanning and measuring**.
- These services are intended to add value to the product design, ranging from **improved performance to lowered cost**.

Strategy

"Printing on demand in one of the world's largest 3D printing factories while improving software solutions and acting as incubators for new verticals through the host of co-creations with industry leaders." - Materialise Investor Presentation

Sales and Marketing

The distribution of the **manufacturing services** is carried out by:

- Sales force
- Online portal
- Complex product offerings are addressed directly by specialized sales managers
- Straightforward products can be ordered directly through the automated system "**Materialise OnSite**".

Customer Segments

The customer base for the manufacturing segment are included in the following industries:

- Automotive
- Aerospace
- Healthcare
- Industrial machining art and design
- Consumer products

Ecosystem Partners



Sources: Annual Report, MTL Investor Presentation 2018

Company Overview | Software Segment

FY19 Highlights

- 10 > customers 22% of Revenue
- Revenues €42M
- Revenue Share 21%
- Growth rate 11.5%
- EBITDA €14M
- EBITDA mg 33%
- Employees 303 FTE

Main Products

MAGICS

Revenue Model

- Sources of revenue in this segment are **maintenance contracts, software licenses, and hardware controller sales** along with custom software development services.
- Licensing software products** can be done perpetually or on a time-basis, along with annual maintenance contracts for software updates or support

Magics' applications include:

- repairing and optimizing 3D models & analysing parts
- designing support structures
- making process-related design changes on STL¹ files
- process planning & documenting customer projects
- nesting multiple parts in a single print run

Further offerings help complement the Magics' Platform that provide automation and other productivity improvements.

- Magics Essentials:** entry-level package offering premium data preparation functionality which is used together with machine build preparation software.
- Magics Print:** conglomerates the key build preparation tools and straightforward build file generation technology (offered to machine manufacturers as a product enhancement to their machines' sale). Upgrading to the expert Materialise Magics provides full data and build preparation functionalities in one package:
 - Streamics**
 - 3-maticSTL**
 - e-Stage**
 - Build Processors and Machine Control Software**
 - Materialise Controller**
 - MiniMagics and MiniMagicsPro**

Strategy "Offer proprietary software worldwide through programs and platforms that enable and **enhance the functionality of 3D printers and 3DP operations**" – Materialise Investor Presentation

Sales and Marketing

The distribution of the **software** is carried out by:

- OEM Partner Sales
- Direct Sales
- Third-Party Distributors

Local offices offer technical help before and after the sale. OEMs and dealers often distribute software products combined with 3D printers to enhance the printers' value proposition and application.

Customer Segments






The customer base includes:

- 3D printing OEMs
- Manufacturers in other industries: consumer goods, automotive, aerospace, and hearing aid industries
- R&D departments
- Internal & External 3D printing service offices.

Ecosystem Partners

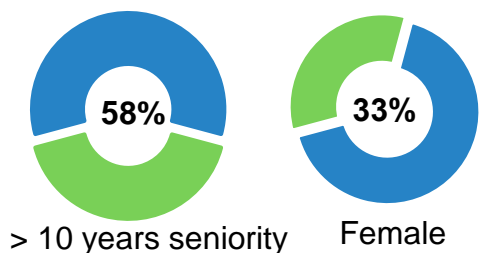
Sources: Annual Report, MTLs Investor Presentation 2018

FY19 Highlights	Subsegments	
<p>Revenues €61M</p>	<h3>Medical Software</h3> <ul style="list-style-type: none"> Materialise's software allows medical-image based analysis, engineering and 3D printed customized designs of surgical guides, implants and other anatomical models. Materialise generates revenues in this sub-segment by selling licenses to its medical software packages (eg. <i>Materialise Mimics/ 3-matic/ OrthoView/ ProPlan CMF</i>) and software maintenance contracts. Materialise Mimics is a medical software that allows 3D models to be printed accurately from medical imaging-data eg. CT or MRI's. Currently, there are over 250 hospitals worldwide that use Materialise Mimics Technology, especially in the Cardiac, Orthopedic, Vascular, Neurological and Hepatobiliary areas. 	<h3>Clinical Services</h3> <ul style="list-style-type: none"> Materialise provides customers with 3D printed surgical guides and patient specific medical implants, allowing doctors to pre-operate in models with the exact scenario they will face in the actual surgical intervention. The procedure to develop a customized implant involves: 1) Sending Materialise a CT scan; 2) Materialise's clinical engineers to organise a plan and design a proposal; 3) Doctors evaluating the proposal and give feedback; 4) Materialise producing and shipping the personalised implant, custom instruments and bone models to support the surgery. The 3D printed surgical guides include: shoulder, osteotomy, knee and hip replacement surgeries, whilst the 3D printed implants are for shoulder, hip and CMF implants.
<p>Revenue Share 31%</p>	<h3>Strategy</h3> <p><i>"Offer products and services that address long-term trends in the medical industry towards personalized, functional and evidence-based medicine"</i> - Materialise Investor Presentation</p>	
<p>Growth rate 16%</p>	<h3>Sales and Marketing</h3> <p>The distribution of medical software is carried out by:</p> <ul style="list-style-type: none"> Direct sales force Website PACS partners <p>The distribution of 3D printed medical devices is executed through agreements with collaborative partners. Clinical services may also be carried out by Materialise's own engineers that developed close connection with key customers.</p>	<h3>Customer Segments</h3> <p>The customer base for the Medical Segment products and services include:</p> <ul style="list-style-type: none"> Medical Device Companies Hospitals Universities Research Institutes Industrial Companies
<p>EBITDA €11M</p>	<h3>Ecosystem Partners</h3>	
<p>EBITDA mg 18%</p>	<p>Sources: Annual Report, MTLs Investor Presentation 2018</p>	
<p>Employees 763 FTE</p>	<p>Company & Market Overview Value Creation & Business Plan Exit & Returns Exit Options & Due Diligence</p>	
<p>3D Printing Machines 32</p>		

	KEY MEMBERS	EXPERIENCE	CAPABILITIES	FIT VALUATION
Executive Committee	 <p>Wilfried Vancraen Founder & CEO 30 years</p>	<p>Prior experience: engineering and consulting. Founded Materialise in 1990 and since then has been recognized with several awards as the most influential person in Additive Manufacturing and one of the biggest contributors to the industry (RTAM/SME Industry Achievement Award, 2013 Visionaries! Award) </p>	<p>Product and Industry expertise: Vision, Technical Know-how, Passion.</p>	
	 <p>Peter Leys Executive Chairman 7 years</p>	<p>Prior to being appointed director and Executive Chairman in 2013, Mr. Leys was a Corporate Finance Partner at Baker & McKenzie CVBA. He holds a Candidacy Degree in Philosophy from KU Leuven and Master of Law degrees from the University of Georgia and the KU Leuven.</p>	<p>Financial expertise: M&A knowledge, capital markets understanding, contract building & negotiation, philosophy and law.</p>	

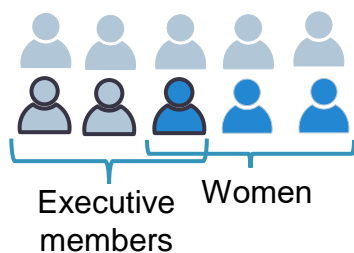
Key Metrics

EXECUTIVE COMMITTEE



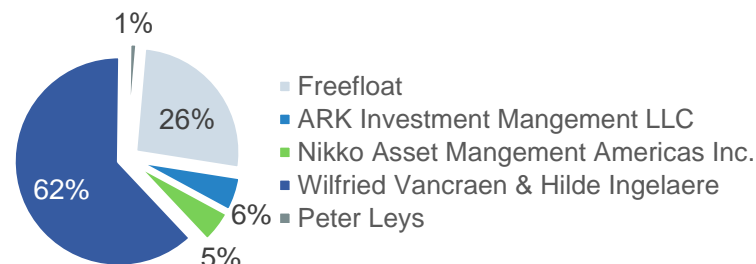
The Executive Committee is composed by 12 members

BOARD OF DIRECTORS



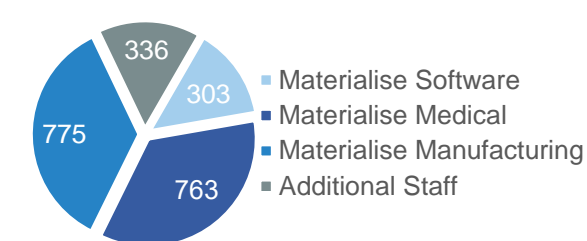
The BoD is composed by 7 fully independent members. There are 2 committees: 1) Audit & 2) Remuneration and Nomination Committee

SHAREHOLDER STRUCTURE



The above graph refers to the beneficial ownership of Materialise's ordinary shares as of April 24th 2020.

EMPLOYEES



Materialise employed 2,177 people in 2019, growing the team by 8.4% YoY.

Sources: See Appendix 1 for further information on the Management Team

Sources: Annual Report, Investor Relations

Company & Market Overview


Value Creation & Business Plan


Exit & Returns


Exit Options & Due Diligence

Appendix 1 | Company Overview


Additional Executive Committee members


 **Hilde Ingelaere** Education: 2 Masters - Bioengineering and Business Administration; Experience: Cardiovascular clinical research and business analyst; Materialise: Joined in 1990, became a director in 1997 (managed HR, legal and finance departments) and became Executive VP of MTLs Medical in 2011;


 **Bart Van Schueren** Education: Master in Mechanical Engineering and PhD in SLM Sintering; Experience: Worked as a liaison engineer & set up research activities of a Co. Materialise: Joined in 1995 and ran the 3D printing service bureau. Became Executive VP in 2011 and CTO in 2016;

 **Johan Pauwals** Education: Master in Electro-Mechanical Engineering w/ Stereolithography; Materialise: Joined in 1990 and worked as a software sales manager, Director of Sales and in 2011 became Exec. VP being responsible for global software;

 **Johan Albrecht** Education: Master in Corporate Finance; Experience: CFO & member of the Executive Committee (EC) & Director of a global laboratory (BARC NV); EC of Cerba European Lab (acquirer of BARC); Materialise: Joined in 2015 in representation of Alfinco BVBA;

 **Steeftaan Motte** Education: 2 Master - Mathematics and Applied Informatics; Experience: Software architect and project manager of NXP Semiconductors; Materialise: Joined in 2010 for the cranio-maxillofacial business, in 2012 became the Director of the Clinical Business Unit and in 2015 was VP & General Manager of MTLs Software;

 **Brigitte de Vet-Vei** Education: Master in Business Administration majoring in Engineering; Experience: VP at Cordis Neurovascular and GM. Became CEO of Acertys group (provider of medical devices and software); Materialise: Joined in 2016 in representation of De Vet Management BVBA as a VP for the Medical segment;

 **Jurgen Laudus** Education: Master in Engineering; Materialise: Joined in 2001 as a project manager, Rapid Tooling sales support and production management, International Production Manager for the AM services and Sales Manager. Became VP of the manufacturing segment;

EXECUTIVE COMMITTEE

Name	Age	Gender	# years at Materialise NV	Position
Wilfried Vancraen	58	Male	30	Founder, Director & CEO
Peter Leys	55	Male	7	Executive Chairman
Hilde Ingelaere	58	Female	30	Director & Executive VP - Medical
Johan Pauwels	52	Male	30	Executive VP - Software
Bart Van der Schueren	53	Male	25	Executive VP & CTO
Johan Albrecht	56	Male	5	Executive VP & CFO
Steeftaan Motte	43	Male	10	VP & Materialise Software segment
Brigitte de Vet-Veithen	49	Female	4	VP & Materialise Medical segment
Jurgen Laudus	41	Male	19	VP & Materialise Manufacturing segment
Eduard Crits	61	Male	2	CIO
Conny Hooghe	54	Female	3	VP & Human Resources
Carla Van Steenberghe	44	Female	17	VP & CLO

BOARD OF DIRECTORS (BOD)

Name	Age	Gender	# years at Materialise NV	Position
Wilfried Vancraen	58	Male	30	Founder & CEO
Peter Leys	55	Male	7	Executive Chairman
Johan De Lille	57	Female	14	Independent Director
Hilde Ingelaere	58	Female	30	Director & Executive VP - Medical
Pol Ingelaere	84	Male	9	Independent Director
Jurgen Ingels	49	Male	7	Independent Director
Jos Vander Sloten	57	Male	13	Independent Director
Lieve Verplancke	60	Female	5	Independent Director
Bart Luyten	43	Male	3	Independent Director
Volker Hammes	56	Male	2	Independent Director

Source: Annual Reports; Materialise's Website

Market Overview

P
olitical

- 3DP requires political intervention as it could threaten people's security. Governments may need to control the dispersion of 3D printers by developing a database with all the locations and holders of 3D printers.
- Government may need to intervene in order to prevent the production of **illegal products** that could lead to the creation of black markets.
- Finally, another issue that requires political intervention is the 3DP of designs that have **intellectual property rights**.

E
conomic

- Given the current economic outlook, **subsidies and grants** for research and development are likely to fall, which will surely impact the 3DP market.
- Likewise, **taxation** is expected to rise in the overall economy both direct and indirect.
- Finally, the private sector will also face great challenges accessing **debt markets** at reasonable conditions.

S
ocial

- 3DP allows companies to run their production in any part of the world. This will create **pressure on the “traditional” manufacturing market** as there is great concentration of production and employment in industrial regions.
- The rising trend for the use of **social networks** may play a crucial role in the evolvement of 3DP. People will want to share their own customized 3D printed designs with friends, family and society as if they were sending photos or videos.

T
echnological

- 3DP is considered a **disruptive technology** in the manufacturing market, as it allows for the production and sharing of customised products and designs.
- However, the 3DP market has **not yet reached its peak** or maturity, as new technologies arise allowing people to model even more their designs and use different materials.

L
egal

- The 3DP market highly relies on **intellectual property (IP)**. Manufacturers and software designers are protected by patents for a limited number of years. However, with the growth of the 3DP market new legislation will be required.
- As it was mentioned in the political factors, the breach of IP rights and contraband production are issues that put constrains on the development of the 3DP market and that call for heavy legislation.

E
nvironmental

- When it comes to **mineral resource consumption** and **water waste**, 3DP is considered more sustainable than the traditional industrial manufacturing process.
- On the other hand, researchers claim that the 3DP process has high **energy demands**, which can contribute to the emissions of Greenhouse Gases (GHG's).

Source: Corporate Finance Institute

Historical Financials | Income Statement

Income Statement (in €m)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Software	11	13	18	26	30	36	37	42
Medical	25	28	30	35	38	43	52	61
Manufacturing	23	27	33	41	46	64	95	94
Total Revenue	59	69	81	102	114	142	185	197
Growth %	-	17%	18%	25%	12%	24%	30%	7%
Gross Profit	35	42	49	59	68	80	102	110
Gross Margin %	60%	60%	60%	58%	59%	56%	55%	56%
Research and development expenses	(9)	(11)	(15)	(18)	(18)	(20)	(22)	(23)
Sales and marketing expenses	(20)	(22)	(28)	(37)	(36)	(39)	(46)	(53)
General and administrative expenses	(8)	(9)	(12)	(15)	(20)	(25)	(32)	(32)
EBITDA (unaudited)	5	8	5	3	8	13	22	26
Adjustments to EBITDA	0	0	1	1	1	2	1	0
Normalized EBITDA (unaudited)	5	8	6	4	9	15	24	27
EBITDA margin %	9%	11%	7%	4%	8%	10%	13%	14%
Net profit	1	3	2	(3)	(3)	(2)	3	2
Profit Margin %	2%	5%	2%	-3%	-3%	-1%	2%	1%

Comments

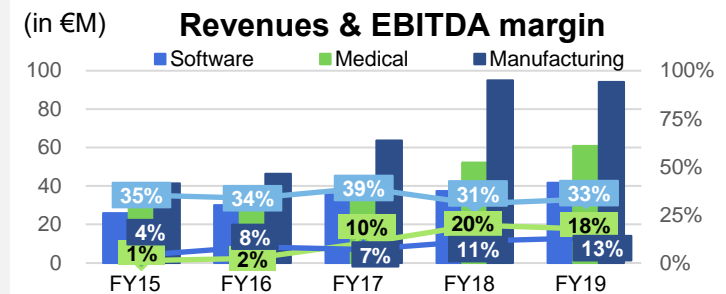
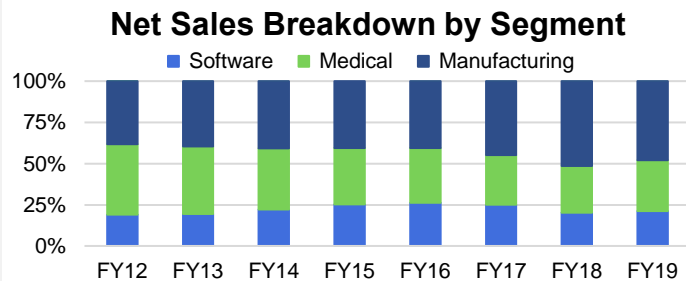
1 The Medical Segment revenue growth from FY17-18 was entirely due to an increase in partner sales, especially in the business lines of CMF, shoulder and knee devices. From FY18-19, the acquisition of **Engimplan** contributed with **€2.4m additional revenue** and while observing continued growth from partner business sales (especially CMF).

2 The acquisition of **ACTech** resulted in **€43.4m additional revenue** from the sale of printed industrial and consumer products, causing the manufacturing segment to weigh 51.4% of revenues compared to 44.7% in FY17.

3 The stagnation of growth in manufacturing revenues due to a less favorable economic scenario in FY19 (i.e. trade war) broke the revenue trend, although partially offset by increases in other segments.

4 Increase in costs mainly reflect the acquisition of ACTech. Increasing operation costs mainly driven by S&M and G&A expenses, both largely composed by payroll expenses.

5 Materialise reaches profitability after increases in revenues from ACTech more than offset increase in costs.

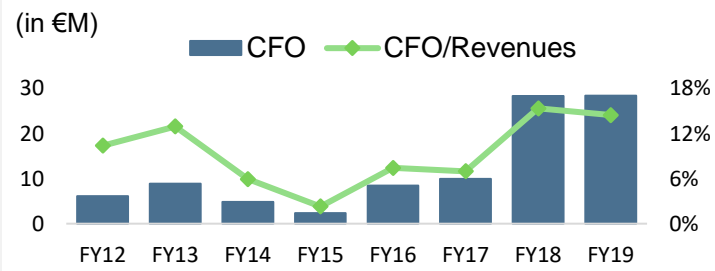
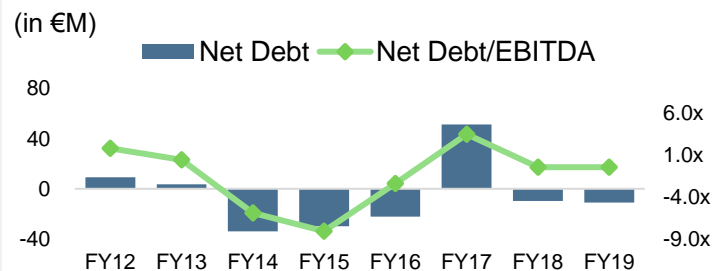


Sources: Annual Report, Investor Relations

Historical Financials | BS & CFS

Balance Sheet (in €m)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Cash and Cash Equivalents	6	13	51	51	56	43	116	129
NWC w/ Cash	4	7	53	46	48	35	96	107
Equity	13	18	85	83	79	77	136	143
Net Debt	9	4	(34)	(30)	(22)	51	(9)	(11)
Net Debt/EBITDA	2x	0x	-6x	-8x	-2x	4x	0x	0x
ROE	11%	19%	2%	-3%	-4%	-3%	2%	1%
ROA	3%	6%	1%	-2%	-2%	-1%	1%	0%

Cash Flow Statement (in €m)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Normalized EBITDA	5	8	6	4	9	15	24	27
Income tax paid	0	0	(0)	(0)	(1)	(2)	(1)	(2)
CFO	6	9	5	2	8	10	28	28
Purchase of PPE	(4)	(2)	(10)	(9)	(12)	(28)	(18)	(13)
Acquisition of Subsidiary (net of cash)	0	(0)	(10)	(2)	0	(27)	0	(6)
CFI	(5)	(3)	(31)	(3)	(13)	(59)	(22)	(26)
Net Proceeds of Loans & Borrowings	3	1	(1)	1	12	42	14	17
Capital Increase in Parent Company	(1)	0	70	1	0	0	60	1
CFF	2	1	62	(2)	9	38	65	11
CFO/Revenues	10%	13%	6%	2%	7%	7%	15%	14%
CFO/Assets	13%	16%	4%	2%	5%	4%	9%	8%
CFF/CFO	39%	8%	1282%	-76%	109%	382%	230%	38%



Comments

1 In June 2014, Materialise went public and sold around 8 million ADS's at a price of \$12.00 per ADS. According to Materialise's financial reports, the company received net proceeds from the **IPO** of approximately \$88.3M.

2 In July 2018, MTLs closed a **private placement** of around 2M ordinary shares to BASF Antwerpen. One week later the company performed a **secondary public offering** of over 3M ADSs at a price of \$13.00 per ADS. Collectively, these capital increases rendered approximately \$65.2M in net proceeds for MTLs.

3 Usually in possession of more cash & eq. relative to its financial obligations, we can see a temporary switch in 2017 given a major increase in Loans & Borrowings to fund ACTech (€27.2M) and PPE (€27.7M).

4 In 2014, MTLs acquired **OrthoView**, an Orthopedic Pre-Operative Planning Software Co. In 2017, acquired **ACTech**, full-service manufacturer of complex metal parts. On August 2019, Materialise concluded the acquisition of **Engimplan**, a Brazilian company specialized in manufacturing of orthopaedic and CMF implants and instruments.

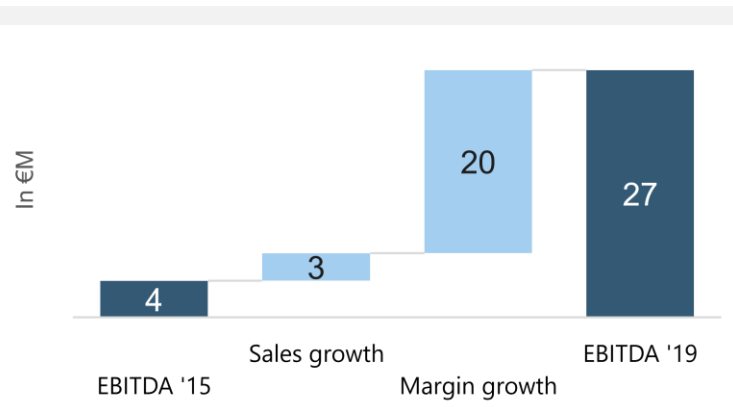
5 This increase in Loans & Borrowings reflect the financing of ACTech's acquisition, expansion of PPE and R&D projects.

Sources: Annual Report, Investor Relations

Historical Financials | FCF

CAPEX (in €M)	FY15	FY16	FY17	FY18	FY19	Free Cash Flow (in €M)	FY15	FY16	FY17	FY18	FY19
Purchase of PPE	(9)	(12)	(28)	(18)	(13)	EBITDA	4	9	15	24	27
Proceeds from of PPE & intangibles	0	2	0	0	0	Depreciation & Amortization	(7)	(8)	(13)	(17)	(19)
Purchase of intangible assets	(2)	(2)	(4)	(2)	(2)	EBIT	(3)	1	2	6	7
Acquisition of subsidiary (net of cash)	(2)	0	(27)	0	(6)	Operating Taxes	0	(2)	(1)	(0)	(3)
CAPEX	(12)	(13)	(59)	(20)	(22)	Maintenance CAPEX	(7)	(8)	(13)	(17)	(15)
Maintenance	(7)	(8)	(13)	(17)	(15)	Expansion CAPEX	(5)	(4)	(46)	(3)	(6)
Expansion	(5)	(4)	(46)	(3)	(6)	Change in NWC	1	2	(7)	10	3
						FCF	(6)	(3)	(52)	13	5

EBITDA Growth



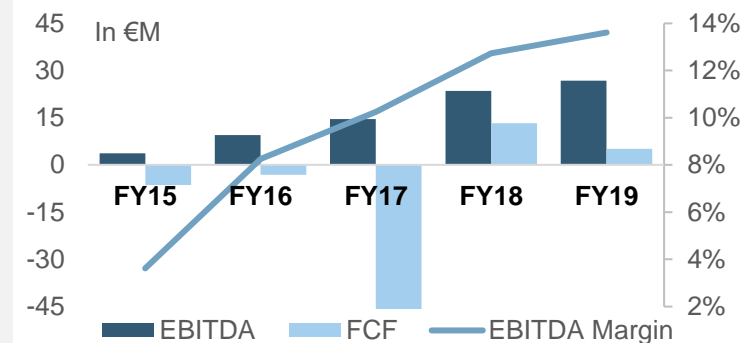
1 EBITDA experienced a constant growth since 2015 with a **CAGR of 73%**. The rise in EBITDA is mainly explained by the **EBITDA Margin improvement** and a smaller part driven by revenue growth.

CAPEX & NWC

2 In 2017 Materialise acquired ACTech, a German full-service manufacturer of complex metal parts, for a total of €28M in cash. This acquisition led to a drastic change in the expansion CAPEX and consequently a very negative FCF in 2017 of around €52M.

3 The Net Working Capital has been changing steadily over the period of 2015 to 2019. These changes are mainly explained by the acquisitions and strategic partnerships that Materialise established over the past few years. Not only ACTech in 2017 but also Engimplan in 2019.

Free Cash Flow

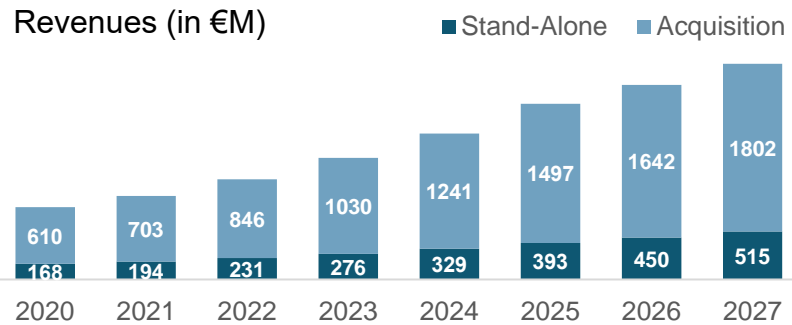


4 The FCFs have been unstable mainly due to the CAPEX, which includes acquisitions of subsidiaries. However, since 2018 the cash flows have been increasing driven by the EBITDA growth.

Sources: Annual Report, Investor Relations

Business Model | Overall Business Plan

Top Line



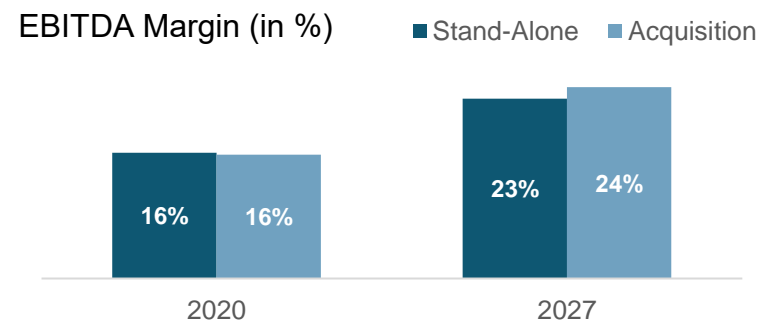
1 Standalone Scenario

Increasing focus in the **APAC** and **US** regions by engaging in strategic partnerships. Special focus in Workflow & CAD Software, in order to enable customized mass-production. Expand the offer of **metal-based printing**, key growth area with increasing demand in the AM industry. In terms of revenues, the period 2020-2027 has a **CAGR of 17.3%**.

2 Acquisition Scenario

This growth can be explained by the revenue synergies arising from the vertical and horizontal integration of Stratasys into Materialise's business. Post-acquisition the company becomes an **all-in-one supplier** which allows for the target of a larger customer base. In terms of revenues, the period 2020-2027 has a **CAGR of 16.7%**.

Bottom Line



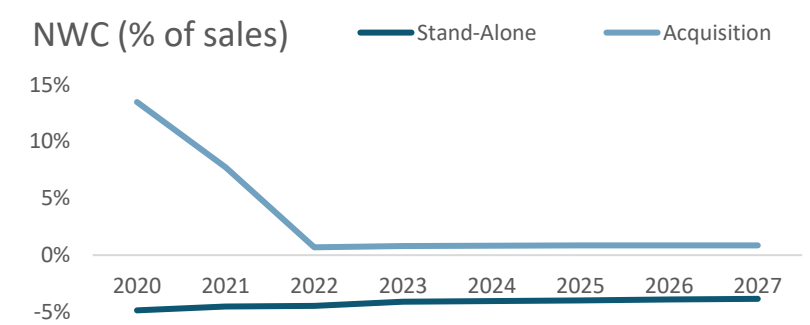
1 Gross Margin (GM)

Materialise already possesses a strong GM when compared to its top competitors. In 2019 Materialise's GM was 61% while Stratasys had a GM of 49%. Post-acquisition, Materialise's **operational efficiency** will contribute to the improvement of Stratasys margins. In addition, the company will also benefit from a **higher bargaining power** with suppliers.

2 EBITDA Margin

In the Stand-Alone scenario Materialise is expected to be able to improve its EBITDA margin at a **CAGR of 5.2%** between 2020 and 2027. With the acquisition of Stratasys, the company will benefit from **R&D and SG&A synergies**, mainly in the Service Provider segment. This will result in a **CAGR of around 6.4%** of the EBITDA margin between 2020 and 2027.

Investments



1 Net Working Capital (NWC)

In 2019, Materialise's **NWC** was **-4%** of revenues, meaning a quick generation of cash from operations, while Stratasys had **32%**. Post-acquisition, the company will hold a stronger bargaining power with its customers and suppliers. In the acquisition scenario, from 2020 to 2022 the NWC will fall steadily, until it remains constant at around 1% from 2022-onwards.

2 CAPEX

In the stand-alone scenario CAPEX will slightly decrease from 8% to 3% of sales until 2027. In the acquisition scenario, the CAPEX will require **larger investments** in order to streamline operations across countries. On the other hand, there will also be **divestures** in the geographical areas where both companies are present.



Individual Paper

Exit & Returns | Sources and Uses - Acquisition Scenario

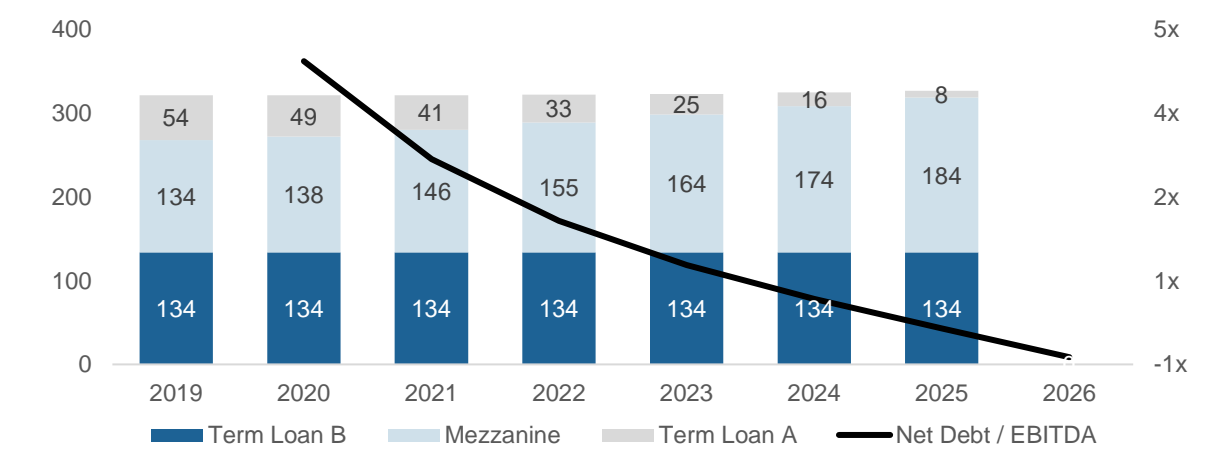
Capital Structure				
Sources of Funds	€	x EBITDA	%	Uses
Senior debt				EBITDA
Term Loan A	54	2,0x	6%	Multiple
Term Loan B	134	5,0x	16%	Transaction Value (EV)
Subordinated debt				- Total debt
Mezzanine	134	5,0x	16%	- Minority Interest
Total debt	321	12,0x	39%	+ Cash
				Purchase Offer (Equity)
				Refinancing of Debt
				Fees
Fixed Return Instrument	481	18,0x	58%	
Ordinary Equity	25	0,9x	3%	
Institutional Investor	20			
Sweet Equity	5		20%	
Total Equity	506	18,9x	61%	
Total sources	827	30,9x	100%	Total Uses
				827

Debt Financing

The total debt financing represents around €321M (39%), corresponding to a multiple of 12.0x EBITDA. The debt sources are divided in Senior debt and Subordinated debt, where Senior debt is divided in two tranches, Term Loan's A and B:

- 1 Term Loan A (2.0x EBITDA)**
Secured debt; 7-year amortized loan; Interest rate of 2.0% + 3M Euribor;
- 2 Term Loan B (5.0x EBITDA)**
Secured debt; 7-year bullet loan; Interest rate of 5.5% + 3M Euribor;
- 3 Mezzanine Debt (5.0x EBITDA)**
Unsecured debt; 7-year bullet loan; Interest rate divided in PIK Element of 6.0% and Cash Element of 1.0% + 3M Euribor;

Debt Repayment Schedule (in €M)



Equity Financing

The total equity financing represents around €506M (61%), corresponding to a multiple of 18.9x EBITDA.

- 1 Fixed Return Instrument (18.0x EBITDA)**
Guaranteed rate of return (PIK) of 3%;
Management buy-in of €10M, 2.0% of FRIs;
- 2 Ordinary Equity (0.9x EBITDA)**
The Management contributed sweet equity of €5M, 2x their yearly wage. In addition, contributed with €0.4M through Inst. Ords, around 1.6% of Ordinary Equity.

Breakdown of Equity		€	%
Institutional Strip		501	
Fund		491	
Fixed Return Instrument		472	
Institutional Ords		19	78%
Management		10	
Fixed Return Instrument		10	
Institutional Ords		0	2%
Sweet Equity		5	20%
Total Equity		506	100%

Exit & Returns | Sources and Uses - Standalone Scenario

Capital Structure

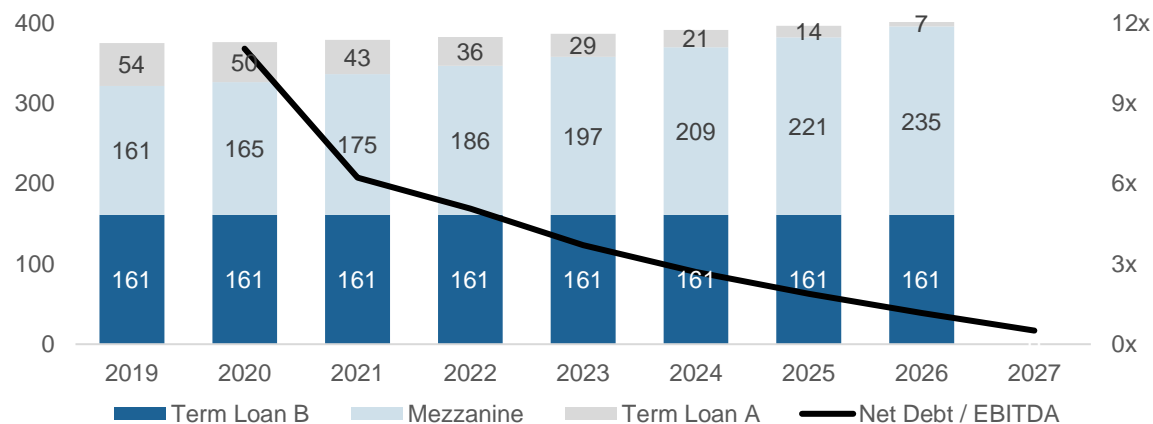
Sources of Funds	€	x EBITDA	%	Uses	€	x EBITDA
Senior debt				EBITDA 2019	27	
Term Loan A	54	2,0x	6%	Multiple	25,1x	
Term Loan B	161	6,0x	19%	Transaction Value (EV)	671	
Subordinated debt				- Total debt	129	
Mezzanine	161	6,0x	19%	- Minority Interest	2	
Total debt				+ Cash	125	
	375	14,0x	45%	Purchase Offer (Equity)	665	26,5x
Fixed Return Instrument				Repayment of Debt	129	4,8x
Ordinary Equity	428	16,0x	52%	Fees	34	1,3x
Institutional Investor	25	0,9x	3%			
Sweet Equity	5		20%			
Total Equity						
	453	16,9x	55%			
Total sources				Total Uses	827	827
	827	33,0x	100%			

Debt Financing

The total debt financing represents around €375M (45%), corresponding to a multiple of 14.0x EBITDA. The leverage is higher in this scenario as there isn't the additional risk of integrating a large manufacturer, Stratasys, into Materialise's business. The debt sources are divided in Senior debt and Subordinated debt, where Senior debt is divided in two tranches, Term Loan's A and B:

- 1 Term Loan A (2.0x EBITDA)**
Secured debt; 8-year amortized loan; Interest rate of 2.0% + 3M Euribor;
- 2 Term Loan B (6.0x EBITDA)**
Secured debt; 8-year bullet loan; Interest rate of 5.5% + 3M Euribor;
- 3 Mezzanine Debt (6.0x EBITDA)**
Unsecured debt; 8-year bullet loan; Interest rate divided in PIK Element of 6.0% and Cash Element of 1.0% + 3M Euribor;

Debt Repayment Schedule (in €M)



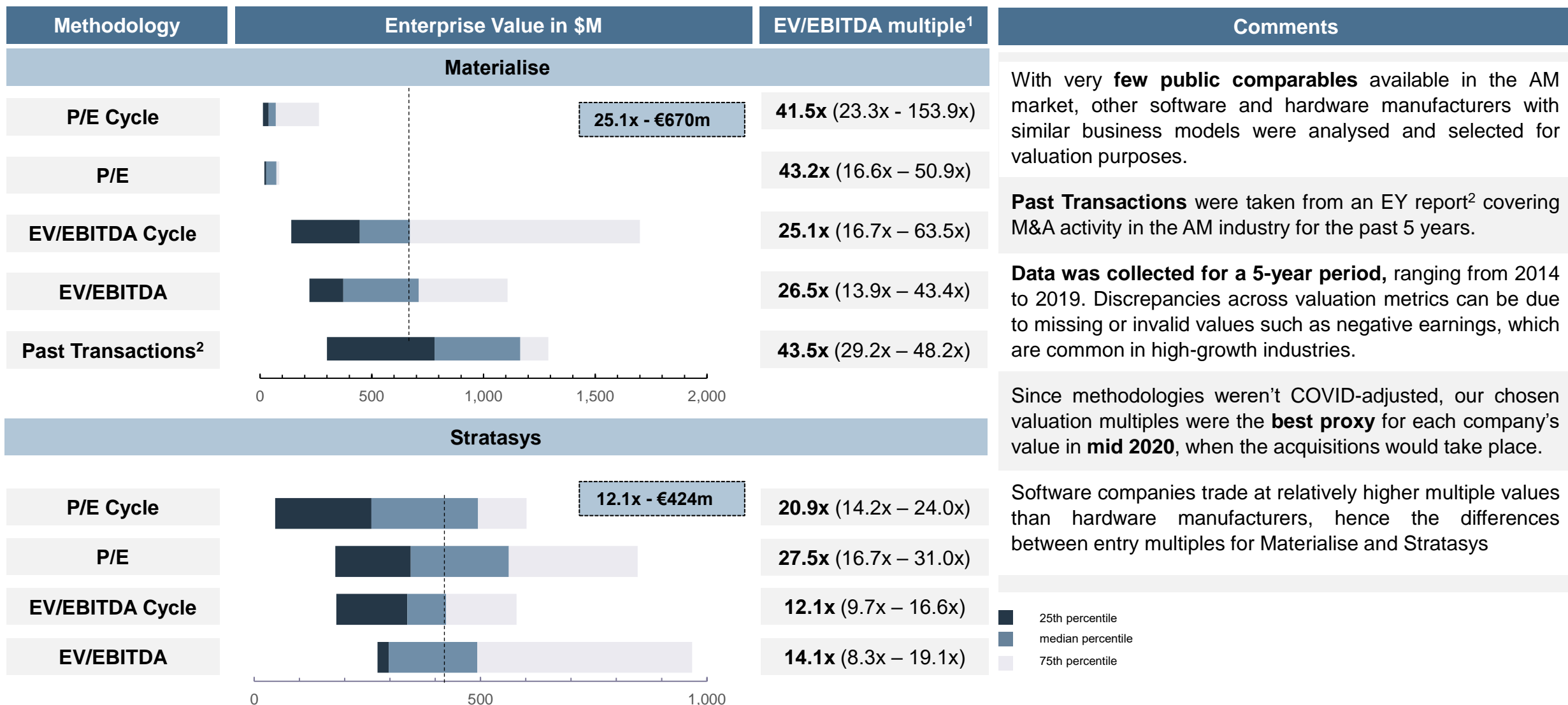
Equity Financing

The total equity financing represents around €453M (55%), corresponding to a multiple of 16.9x EBITDA.

- 1 Fixed Return Instrument (16.0x EBITDA)**
Guaranteed rate of return (PIK) of 3%;
Management buy-in of €10M, 2.2% of FRIs;
- 2 Ordinary Equity (0.9x EBITDA)**
The Management contributed sweet equity of €5M, 2x their yearly wage. In addition, contributed with €0.4M through Inst. Ords, around 1.8% of Ordinary Equity.

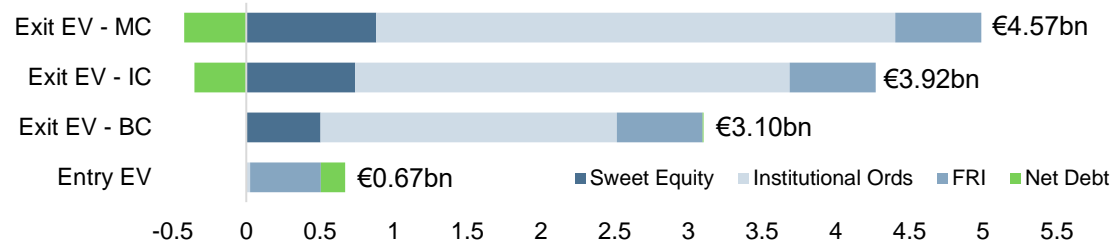
Breakdown of Equity		€	%
Institutional Strip		448	
Fund		438	
Fixed Return Instrument		418	
Institutional Ords		19,4	78%
Management		10	
Fixed Return Instrument		9	
Institutional Ords		0	2%
Sweet Equity		5	20%
Total Equity		453	100%

Exit and Returns | Entry Valuation for EV



Exit & Returns | Key Credit Statistics & Model Returns – Acquisition Scenario

Exit Enterprise Value Evolution



The exit planned in **2026** is set to happen at a valuation of **€3.92bn**. The **upside is captured by the Institutional Ords and Sweet Equity** while Net Debt decreases to negative figures, with larger discrepancies in more optimistic models. Additionally, FRI remains constant.

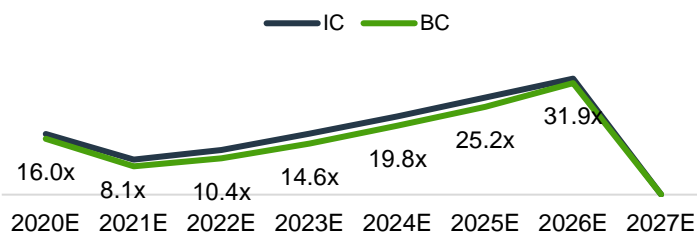
Institutional & Management Returns – IC

Returns in €M	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Management Exit Proceeds	41	146	238	379	526	700	819	933
Management Equity	14,9	14,9	14,9	14,9	14,9	14,9	14,9	14,9
Management MM Returns	2,7x	9,8x	16,0x	25,5x	35,3x	47,0x	55,0x	62,7x
Returns Institutional Investor	547	940	1289	1815	2359	3005	3452	3388
Institutional Investor Equity	491	491	491	491	491	491	491	491
Institutional MM Returns	1,1x	1,9x	2,6x	3,7x	4,8x	6,1x	7,0x	6,9x
IRR	24%	54%	47%	45%	42%	39%	35%	29%

The fund is expected to provide a MM return of **7.2x**, yielding top management a **62.7x** return and achieving an IRR of **35%**.

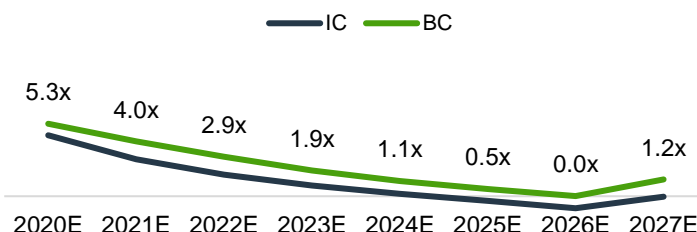
Credit Statistics

Interest Cover Ratio



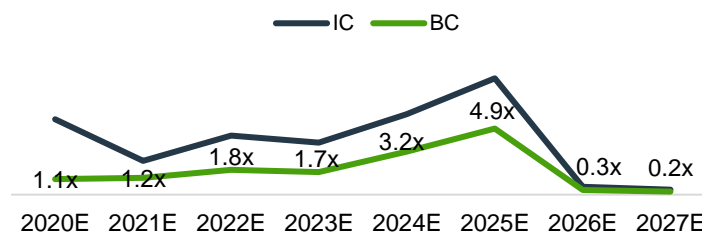
Despite only 17% of total debt being amortized, the ratio became steeper as **EBITDA rose exponentially** until standing at **31.9x in the exit year**.

Net Debt to EBITDA



Net Debt to EBITDA ratio substantially improves to **0.0x at exit**, with the strengthening of EBITDA margins, as the company is able to generate higher cash levels while also repaying its debt.

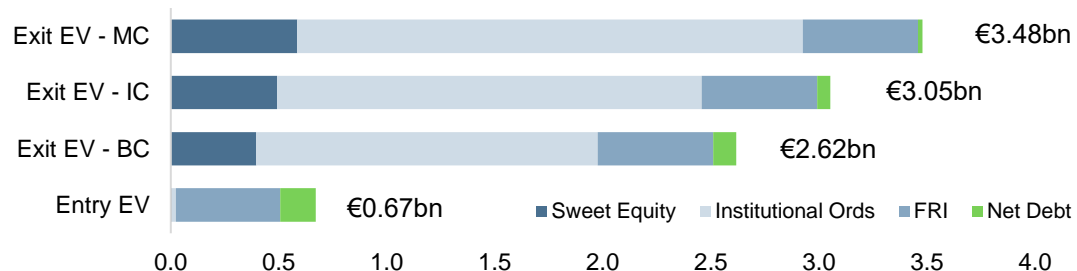
Cash Cover



Cash generation stood strong and improving above 1.0x during the investment period. The **reduction in this ratio relates to the repayments** done in 2026 and 2027.

Exit & Returns | Key Credit Statistics & Model Returns – Standalone Scenario

Exit Enterprise Value Evolution



The exit planned in **2027** is set to happen at a valuation of **€3.05bn**. The **upside is captured by the Institutional Ords and Sweet Equity** while Net Debt decreases, with larger discrepancies in more optimistic models. Additionally, FRI remains constant.

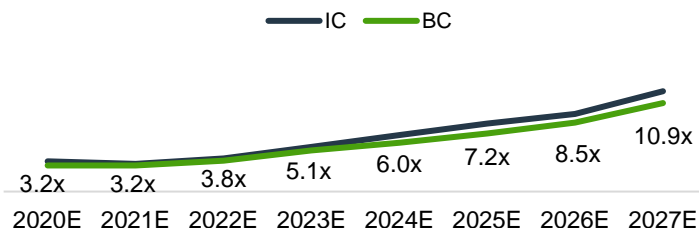
Institutional & Management Returns – IC

Returns in €M	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Management Exit Proceeds	17	68	106	184	269	358	446	551
Management Equity	14,9	14,9	14,9	14,9	14,9	14,9	14,9	14,9
Management MM Returns	1,2x	4,6x	7,1x	12,3x	18,1x	24,1x	30,0x	37,1x
Returns Institutional Investor	417	613	760	1055	1376	1711	2044	2440
Institutional Investor Equity	491	491	491	491	491	491	491	491
Institutional MM Returns	0,8x	1,2x	1,5x	2,1x	2,8x	3,5x	4,2x	5,0x
IRR	-28%	16%	19%	24%	26%	25%	25%	24%

The fund is expected to provide a MM return of **5.1x** yielding top management a **36,1x** return and achieving an IRR of **24%**.

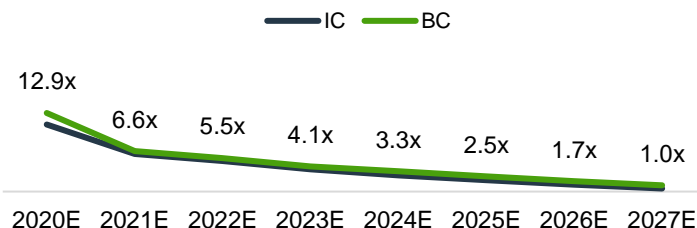
Credit Statistics

Interest Cover Ratio



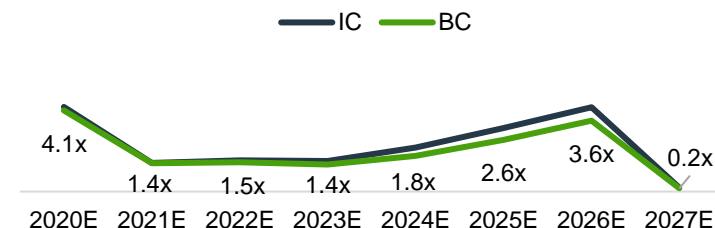
Despite the inexistence of amortizable debt, the ratio became steeper as **EBITDA rose exponentially** until standing at **10.9x in the exit year**.

Net Debt to EBITDA



Net Debt to EBITDA ratio is reducing over time, improving to **1.0x at exit**, with the strengthening of EBITDA margins and the higher cash generation, despite debt levels still increasing.

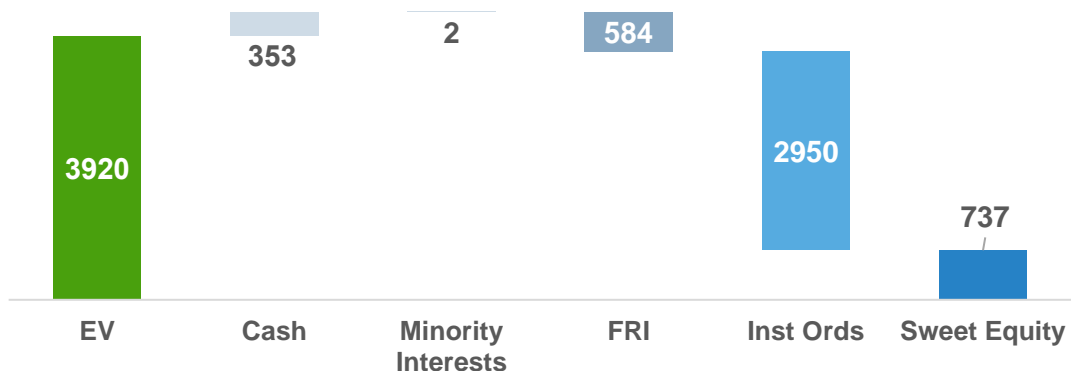
Cash Cover



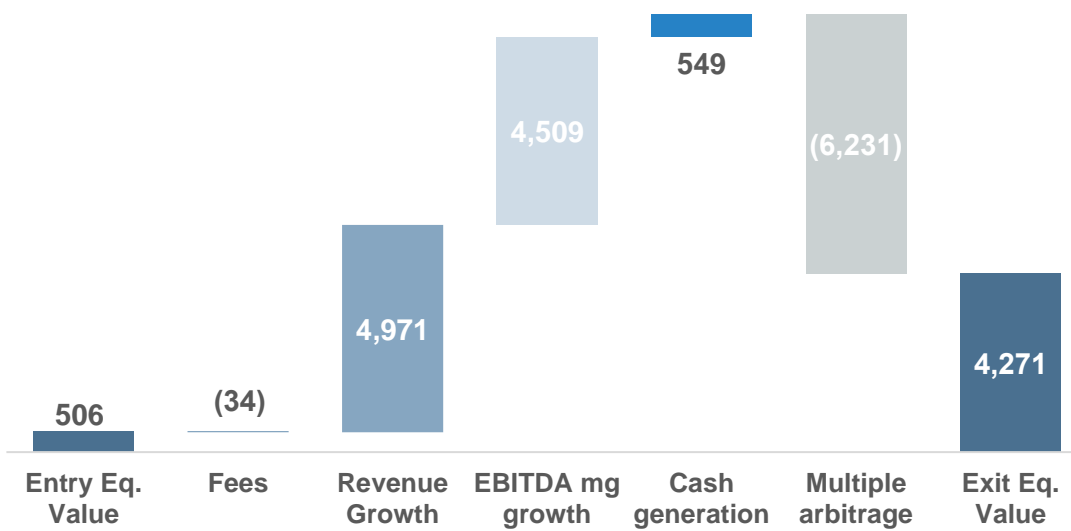
Cash generation stood strong above 1.0x and **constantly improving during the investment period**. The reduction of this ratio to 0.2x relates to the repayments done in 2027.

Exit & Returns | Value Creation – Acquisition Scenario

Exit Waterfall (€M)



Value Creation Breakdown (€M)

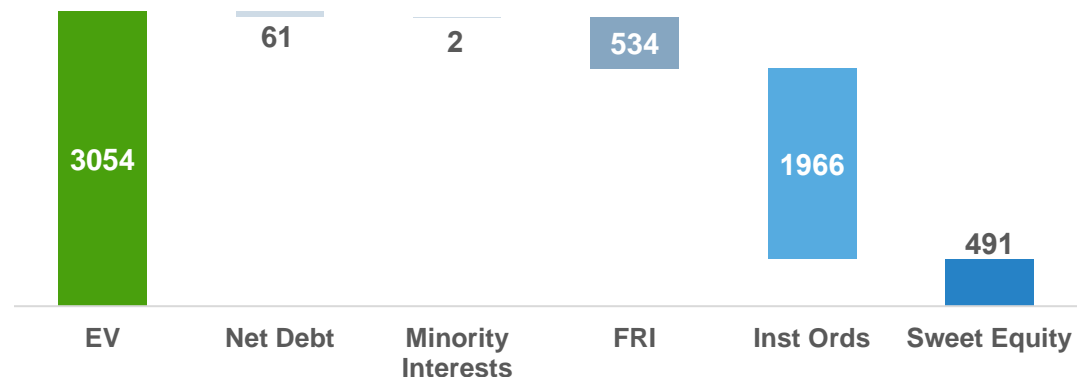


Comments

- At exit, the **Enterprise Value** will be **€3.9bn**. With no debt outstanding and excess cash of €0.4bn, the **Equity value** is expected to grow from **€0.5bn to €4.3bn**, implying a **value creation** of nearly **€3.8bn** until 2026.
- During the holding period, Materialise operations will be able to generate more than enough cash (€0.5bn) to repay all the outstanding debt. Thus, the total **Net Debt** will go from **€0.2bn to -€0.3bn**.
- After deducting the sub loan (FRI), shareholders remain with a total of €3.7bn (Ordinary Shares), with **€0.7bn corresponding to sweet equity** (20%) and **€3bn to institutional investors** (80%).
- Revenue growth is the major source of value creation**, due to both organic and inorganic growth, contributing with roughly **€5bn** – being **€0.6bn** provided by **Stratasys** acquisition and **€4.4bn** by the Additive Manufacturing's **market growth** and **merger synergies**.
- Improvements in EBITDA margin** are expected to represent a value creation of **€4.5bn (+9.4pp)** driven by our business plan to improve the company's operating efficiency, aiming at a margin in line with larger competitors in the industry to which Materialise will compare after the vertical integration.
- The **exit EV/EBITDA multiple (9.7x)** is expected to decrease significantly over time in the acquisition scenario. The difference is explained by the current expectations in the 3D printing market that are foreseen to cool down after a very bullish period. In addition, Stratasys has a lower multiple what contributes to a negative multiple arbitrage. For the multiples estimation, it was assumed the median of the EV/EBITDA Cycle.

Exit & Returns | Value Creation – Standalone Scenario

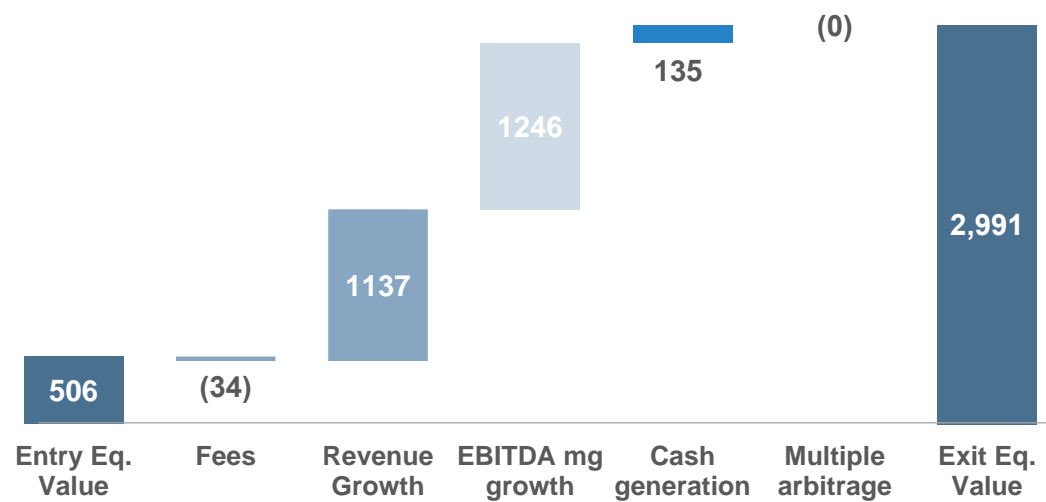
Exit Waterfall (€M)



Comments

- At exit, the **Enterprise Value** will be **€3bn**, being **98%** attributable to **Equity**, implying a **value creation** of nearly **€2.5bn**.
- The total **Net Debt** will go from **€196M to €61M**, representing roughly **2% of the EV** at the exit. This debt repayment is possible with the cash generation from the operating activity of approximately **€135M**.
- After deducting the sub loan (FRI), shareholders remain with a total of **€2.5bn** of ordinary shares, where **€0.5bn** corresponds to **sweet equity (20%)** and **€2bn** to **institutional investors (80%)**.

Value Creation Breakdown (€M)



- Improvement in the EBITDA margin from 13.6% to 24.5% is the major source of value creation (€1.2bn)**, driven by reductions in operating and non-operating costs, as we shrink the cost margins by leveraging on scale.
- Revenue growth** will contribute with nearly **€1.1bn** to value creation driven by the Additive Manufacturing market's massive growth.
- The **exit EV/EBITDA multiple (25.1x)** is the same as the entry multiple. Kindly note that the exit multiple is still higher than in the acquisition scenario since in the previous case it is added a company (Stratasys) with a lower multiple than Materialise which also decreases substantially in 2027. For the multiples estimation, it was assumed the median of the EV/EBITDA Cycle.

Acquisition Scenario

INVESTMENT		Returns		
		2025	2026	2027
Exit Multiple	7,7x	4,7x	5,4x	5,1x
	8,7x	5,4x	6,2x	6,0x
	9,7x	6,1x	7,1x	6,9x
	10,7x	6,9x	7,9x	7,8x
	11,7x	7,6x	8,7x	8,7x

INVESTMENT		IRR		
		2025	2026	2027
EBITDA Margin	23%	38%	35%	29%
	24%	39%	35%	29%
	24%	40%	35%	30%
	25%	40%	36%	30%
	25%	41%	36%	31%

Standalone Scenario

INVESTMENT		Returns		
		2025	2026	2027
Exit Multiple	23,1x	3,2x	3,8x	4,5x
	24,1x	3,3x	4,0x	4,7x
	25,1x	3,5x	4,2x	5,0x
	26,1x	3,7x	4,4x	5,2x
	27,1x	3,9x	4,6x	5,5x

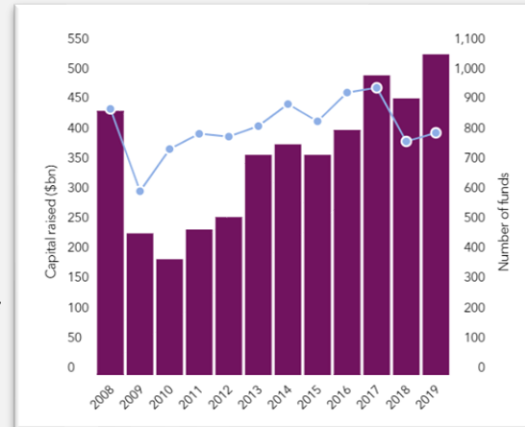
INVESTMENT		IRR		
		2025	2026	2027
EBITDA Margin	22,0%	26%	24%	23%
	22,5%	27%	25%	24%
	23,0%	27%	26%	24%
	23,5%	28%	26%	25%
	24,0%	28%	27%	25%

- Returns remain attractive across both scenarios, although the acquisition of Stratasys would provide significantly higher upside.

COVID impact in Leverage Buyouts

LBO Trends before 2020

- In the United States, Private Equity funds raised more than \$500 billion in 2019 being \$393 billion correspondent to LBO deals. The average buyout deal size reached the highest in the decade (\$419 million)
- The LBO model can work well during booms. In the most recent years, with interest rates with historically low levels and with hedge funds underperforming the market, Private Equity companies end up 2019 with a record value of \$1.43 trillion of capital available.



LBOs during COVID

- LBO companies usually carry high levels of risk due to large amounts of Debt. In times of economic crisis, whether it's a traditional recession or a pandemic, the more difficulty companies will have to generate cashflows from the operating activities and the higher the probability of default.
- The pandemic has caused an increase in bankruptcies for a wide range of companies, some of which belong to private equity firms.
- For this reason, Materialise could not ask for high levels of debt, taking into account the lower activity in 2020 and 2021 that would jeopardize debt amortization.

Leverage Buyouts after the pandemic

- The most recent bankruptcies during this crisis have highlighted and brought to discussion lack of regulation in the form of financing LBOs. In 2013, the Federal Reserve issued guidelines on LBO financing related to maximum leverage and it is now debated whether such limits should become mandatory.
- As established above, private equity activity is highly exposed to systematic risk and the conditions of capital markets. Through the uncertainty of the following years regarding the evolution of the pandemic and the economic recovery, the number of LBOs is expected to fall considerably.
- On the other hand, after the pandemic and with more stable market conditions, most private equity firms will find out many investment opportunities with companies facing restructuring needs and at a discount price.

1) Company-related sources:

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