EDISON

# Nano Dimension

Results and strategy update

## On the cusp of commercialisation

Tech hardware & equipment

**Nano Dimension has combined techniques from 3D printing and nanotechnology inks to develop an innovative system that revolutionises printed circuit board (PCB) prototyping, enabling designers to bring the process in house. This reduces time to market and ensures that IP security is not compromised. During Q217, the company successfully completed its beta test programme, meeting management's stated timescales and preparing the way for early commercial sales in H217.This progression to commercial engagement has given management a more accurate view of pricing models and ramp-up rate, so we have pulled back our estimates and cut our indicative valuation (which is based on current levels of executional risk) from US$12.47/ADS to US$7.04/ADS.**

| Year end | Revenue (US$m) | EBITDA** (US$m) | PBT* (US$m) | EPADS* ($) | DPADS ($) | P/E (x) |
|---|---|---|---|---|---|---|
| 12/15*** | 0.0 | (2.4) | (2.1) | (0.39) | 0.0 | N/A |
| 12/16 | 0.0 | (6.5) | (6.8) | (0.83) | 0.0 | N/A |
| 12/17e | 2.4 | (13.7) | (14.7) | (1.32) | 0.0 | N/A |
| 12/18e | 17.8 | (4.0) | (5.6) | (0.38) | 0.0 | N/A |

Note: *PBT and EPADS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments. **EBITDA stated after deducting amortisation of capitalised R&D. ***Translated from NIS.

## Beta phase confirms investment proposition

Nano Dimension delivered 16 printers to beta-phase customers between August 2016 and June 2017. These customers include companies designing electronic goods, defence companies and PCB service providers. Customers used the printers extensively to create multi-layer circuits. The feedback provided, which was predominantly positive, helped Nano Dimension to define a commercial grade variant for delivery later this year. In parallel, the company made some significant advances in technology for printing structural electronics and announced its intention to form a separate entity for commercialising its bio-printing IP.

## Commercial deliveries to commence in H217

Nano Dimension is preparing to commence commercial deliveries during H217, in line with its original schedule. Now that it is working through its sales pipeline and negotiating contracts in earnest, as well as establishing a network of distributors, it has better visibility of pricing models and routes to market. We revise our estimates to reflect the introduction of a leasing option, greater use of distributors and a lengthier sales cycle than management had originally anticipated.

## Valuation: Significant upside on volume roll-out

Our indicative share price of US$7.04/ADS (NIS5.06/ordinary share) (formerly US$12.47/ADS or NIS8.99/ordinary share) is based on a DCF analysis. This uses a discount rate of 12% to reflect the current uncertainty regarding the rate of commercial ramp-up. Delivery to our estimates would remove this uncertainty, justifying significant share price appreciation past this indicative value towards a risk-free (10% discount) of US$9.22/ADS or NIS6.63/share. This valuation excludes any contribution from bio-printing or structural electronics.

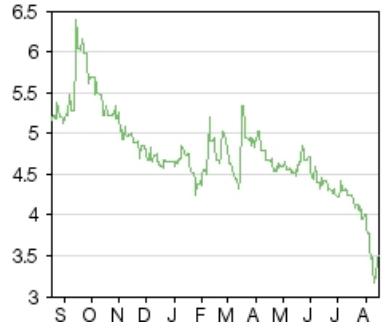
**21 August 2017**

| | |
|---|---|
| **Price*** | **NIS3.50** |
| **Market cap** | **NIS216m** |

*Priced at 15 August 2017

| | |
|---|---|
| | NIS3.60/US$ |
| Net cash (US$m) at end June 2017 | 16.5 |
| Shares in issue | 61.8m |
| ADRs in issue | 12.4m |
| Free float | 77% |
| Code | NNDM |
| Primary exchange | TASE |
| Secondary exchange | NASDAQ |

### Share price performance




| % | 1m | 3m | 12m |
|---|---|---|---|
| Abs | (17.5) | (21.9) | (33.5) |
| Rel (local) | (13.8) | (19.1) | (31.8) |

| | | |
|---|---|---|
| 52-week high/low | NIS6.4 | NIS3.2 |

### Business description

Nano Dimension focuses on the development of advanced 3D printed electronics systems and advanced additive manufacturing. The company's initial products include a 3D printer for rapid prototyping of multi-layer PCBs and associated nanotechnology conductive and dielectric inks.

### Next event

| | |
|---|---|
| Q3 results | November 2017 |

### Analysts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# Investment summary

## Company description: Making electronics 3D

Nano Dimension is focused on the research and development of advanced 3D printed electronics. The flagship product is the DragonFly 2020 3D printer for rapid in-house prototyping of multi-layer PCBs. Unlike competitive systems, it is able to output complex multi-layer PCBs with the relatively fine conductive tracks required for commercial applications because the system uses proprietary nanotechnology-based conductive and dielectric inks. The DragonFly system is targeted at the prototyping segment of the PCB market. We estimate that the total available market (estimated as 20% of all PCB prototyping) could grow to be worth US$836m by 2025, equivalent to 8.6k print systems. In the longer term, we expect almost half of the revenues to be derived from sales of replacement ink for use with print systems, effectively forming a source of recurring revenues. Nano Dimension has also demonstrated the capability to print human cells and tissue and intends to establish a separately funded subsidiary to commercialise this opportunity.

## Sensitivities: Technical and market risks reducing

Nano Dimension has a potentially disruptive technology, which has been tested extensively on potential customer sites and is scheduled to commence commercial sales later this year. As a result of feedback from the 16 beta-phase customers, Nano Dimension has refined both the printer and ink technology, substantially reducing technical risks. It has also built up a pipeline of around 100 potential customers. There remains significant uncertainty on the initial rate of roll-out. This is because the early sales will be made to large corporates as these employ big teams of electronic designers, but have lengthy procurement processes. In addition, there is uncertainty as to whether customers will prefer to purchase equipment or to lease it. Initially, Nano Dimension believed that beta customers would purchase equipment, but discovered that a leasing model was preferred.

## Financials: First commercial deliveries scheduled this year

H117 revenues, which were from beta-phase customers, totalled US$0.3m. Operating losses almost doubled year-on-year during H117 to US$8.8m, reflecting a substantial increase in R&D staff and also a decision to cease capitalising R&D from Q416 onwards. During H117, the company raised c US$13.5m through three placings, each at NIS4.2/ordinary share, leaving US$16.5m cash at the end of June 2017. Management estimates that this is sufficient to take the group through to break-even, which it anticipates reaching by the end of FY18. Noting the uncertainty regarding the initial rate of commercial roll-out during H217 and FY18, we reduce the number of commercial grade printers estimated to be delivered during H217 from 35 to 24 and in FY18 from 200 to 150. We also model some printers being supplied on a leasing model and reduce the average selling price in FY18 to reflect a higher proportion of sales being made through distributors. The impact of this is summarised in Exhibit 6. Our estimates exclude any revenues from complementary markets such as structural electronics or printing biological tissues.

## Valuation: Share price continues to underplay potential

At current levels of risk, which acknowledge that the technology has acquitted itself well during the beta test phase but that the outcome of the commercial roll-out is still uncertain, our indicative valuation returns a fair value of US$7.04/ADS (NIS5.06/ordinary share) (formerly US$12.47/ADS or NIS8.99/ordinary share). Delivery to our estimates and key milestones over the next six months would reduce the discount rate applied (currently 12%), justifying share price appreciation beyond the current indicative value.

# Company description: PCB factory in a box

Nano Dimension is developing and commercialising solutions for advanced 3D printed electronics systems for a number of applications. Its initial focus is on additive manufacturing of prototype PCBs. During the recent beta test phase, the company's solutions were shown to substantially shorten the time required for designers to manufacture prototypes, thus reducing time to market, and enhancing IP security. Other applications, such as 3D printing of structural electronics and printing of human cells and tissue, are being targeted further out. Nano Dimension intends to derive revenues from sales of printers and the inks used in them, thus generating recurring revenues.

Nano Dimension's solutions embrace a combination of proprietary nano-technology conductive and dielectric inks, hardware and software. In Q215, the company unveiled the alpha version of an innovative 3D printer, the DragonFly 2020, for professional multi-layer PCBs. It delivered printers to 16 beta-phase customers between August 2016 and June 2017, and we expect it will make its first commercial sales later this year. The technology used for 3D PCB printing and the complementary activities are protected by a growing patent portfolio.

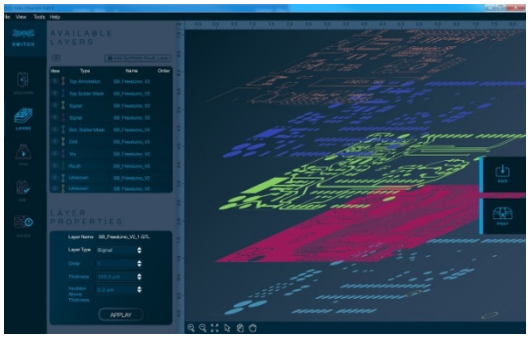
Founded in July 2012 by directors Amit Dror, Sharon Fima and Simon Fried, Nano Dimension listed on the Tel Aviv Stock Exchange in August 2014, following a reverse merger with a shell company, and then on NASDAQ in March 2016. The company is based in Ness-Ziona near Tel Aviv. Ness-Ziona is home to a cluster of 3D print companies, providing a good local recruitment pool. The company currently employs around 110 full- and part-time staff.

# Initial commercial focus: PCB prototyping

**Exhibit 1: DragonFly 2020 3D printer**


Source: Nano Dimension

**Exhibit 2: Switch software package**



Source: Nano Dimension

Nano Dimension has initially focused on solutions for PCB prototyping that give electronics designers a fast, secure alternative to outsourced prototype production. Its solutions combine technologies from three key disciplines: nanoparticle inks, 3D printing hardware and computer-aided design (CAD) software.

## Nano Dimension's solution for PCB prototyping

### Nanotechnology inks – the key differentiator

The key enabler behind the DragonFly system is a suite of nanotechnology inks, which form both the conductive and the insulating regions of a PCB.

The conductive inks contain a dispersion of silver nanoparticles. The inks are formulated so that they are sufficiently conductive to produce track widths that are as narrow as those produced using conventional lithographic processes, and exhibit uniform conductivity and good adhesion so that the tracks do not wear off during use. (Management states that these are the highest conductivity inks currently available.) The proprietary dielectric ink, which forms the insulating regions in circuit boards, is a modified epoxy. It is formulated so it can be extruded through DragonFly's fine print heads. Once deposited and cured, it has similar electrical, thermal and mechanical properties to the FR4 material typically used as a substrate in rigid circuit boards.

Nano Dimension's ability to create exceptionally conductive inks depends on a process for extracting 10-100nm particles of pure silver from widely available silver compounds. Nano Dimension licenses this IP from the Hebrew University of Jerusalem on an exclusive basis. Under the terms of this licence, which will remain in effect until at least April 2029, Nano Dimension will be required to pay royalties of around 3% on sales of conductive ink. The process is protected by three patents. In addition, Nano Dimension has submitted its own patent applications for the dielectric ink and a next-generation, ultra-conductive ink.

### 3D printer – innovative DragonFly incorporating patented technology

Nano Dimension's DragonFly printer makes multi-layered PCBs by printing the conductive and dielectric inks onto a sacrificial substrate. Importantly, the two inkjet print heads have hundreds of small nozzles that allow for exact picolitre deposition of nanotech inks, contributing to the ability to achieve fine dimension conductive traces. Each pass of the print head deposits a 2 micron layer of material at the exact locations specified by the CAD software. The inks are heated to remove surplus solvent and then cured using strong IR/UV (infra-red/ultra-violet) light sources prior to the deposition of the next layer. The maximum size of circuit that may currently be deposited is 200x200x3mm. This does not cover all PCB applications, although management intends future generations of DragonFly printers to be able to output larger dimension boards. A large, complex, 10-layer board will potentially take overnight to print. Nano Dimension has submitted several patent applications covering its own printing technology, although the printer itself is built out of standard components.

### Software – proprietary 'Switch' package with patented algorithms

The company's proprietary software package, 'Switch', processes the output from different brands of CAD software used by electronic designers. Switch converts this output, which describes the topology of each layer of the circuit, into instructions for controlling the movement of the DragonFly printer heads and deposition of the inks. The user interface enables designers to adjust numerous parameters including layer thickness, conductor width, layer order, punching and rotation options as well as the shape or object outline. Nano Dimension has submitted a patent application covering algorithms used in the software that result in substantial savings in inks and time. Nano Dimension completed the development of the initial version of the Switch software package in July 2016. In April 2017, the company announced that it was working with Zuken, one of the leading providers of 3D print software to make it simpler for engineers to port designs from Zuken's CR-8000 Design Force software suite to Nano Dimension's Switch package.

## Conventional PCB prototyping

### PCB structure – multi-layers required for complex circuits

PCBs are an overlooked but vital and near ubiquitous part of electronic devices. In the simplest form, a single-sided PCB, a design of conductive tracks, is created on a non-conductive board by using chemical etches to remove unwanted copper. Components are then attached on the surface

of the board so that the conductive tracks connect them up. The substrate provides a mechanical support for both conductive tracks and components.

As tracks on a single-layer board cannot cross each other, more complex designs are typically double-sided, while for the most complex circuits a multi-layer PCB is required. This consists of multiple layers (up to 30) of chemically etched insulating substrates with conductive tracks on both sides. The substrate layers are sandwiched together with insulating material separating each layer. The connective tracks loop around each other, passing from layer to layer through regions referred to as vias.

### Outsourced prototyping predominates

The majority of electronics manufacturers outsource PCB prototyping. During the design phase of a new electronics device, engineers define the topology of the PCB and simulate its performance using CAD software, then send that design information to a third party, which will manufacture a small number of PCBs using exactly the same process as that used for volume production. This is a highly specialist process requiring significant capital investment and manufacturing know-how. Photolithography is used to pattern the electrical traces on each layer of substrate, with around 15 different steps required to pattern each layer. Further processing steps drill the holes for the vias, copper plate them to make them conductive, align the individual layers so that the traces track correctly from one layer to another and press the layers together at high temperature.

### Drawbacks of outsourcing – delays and IP leakage

Although outsourcing is much more capital efficient, it does add a delay to the process (anywhere between one day and three weeks depending on the location of the supplier, most of which are in the Far East) and urgency, especially when one takes into account that the design phase can involve several iterations. This delay can clearly be costly, but it can also result in suboptimal designs as the number of design iterations is often curtailed to reduce cost and the length of the design cycle. In certain verticals (eg defence, cutting-edge technology) there is also a potential IP risk inherent in outsourcing prototype production to a third party. We note that many of the beta-phase customers are engaged either in the defence industry or in Silicon Valley. In both sectors, security of IP is vital and the ability to carry out multiple design variants in the time previously taken to get a single circuit board manufactured is a significant competitive advantage.

## Market parameters

### Scoping potential for a disruptive technology – top-down approach

As using 3D printing techniques for PCB prototyping is a disruptive technology, there are no statistics relating directly to market size. In January 2016, industry commentator TechNavio noted that the global PCB market reached nearly US$61.5bn in 2015, and predicted an increase to US$63.5bn in 2016 with a CAGR of 3.1% from 2016 to 2021. In November 2016, Future Market Insights predicted that the global value of the PCB design software market would grow at a CAGR of 12.9% from around $1.4bn in 2016 to around $4.8bn by 2026. It noted that one of the key drivers for market growth is the requirement to simplify the PCB design process and thus accelerate the design phase for inventive electronic devices. This indicates that the level of PCB design activity globally continues to grow and, consequently, that demand for PCB prototyping is rising. If we assume that the PCB market continues to grow at a 3.1% CAGR between 2021 and 2025, it will reach US$83.6bn by 2025. Demand is being driven by the need to introduce new electronic products quickly, especially in the consumer electronics, medical devices and automotive sectors. Noting that global average expenditure on R&D is 2.4-5% of GDP, we assume that 5% of the global PCB market value is PCB prototyping. If 20% of this prototyping activity is brought in house, this

represents a total available market of US$836m, equivalent to 8.6k PCB printer systems annually if the price erosion profile adopted in our valuation is used.

### Nano Dimension could enlarge the market for prototyping equipment

As an alternative point of reference, the current market leader for dedicated PCB prototyping equipment (which is not based on 3D printing) is Germany-headquartered LPKF Laser & Electronics. In 2016, LPKF's electronic development equipment division, which is predominantly PCB prototyping equipment, generated revenues of €22.6m (€25.5m in 2015). We estimate that this represents sales of several hundred prototyping units annually. Nano Dimension's solution, once commercialised, will potentially be substantially easier to use than LPKF's equipment, since it requires one rather than multiple steps, and is therefore likely to attract more users, in our view.

### Estimated one million users of PCB design software globally

With regard to the total number of potential sales annually, Nano Dimension estimates that there are around one million users of PCB design software globally, all of whom need access to PCB prototyping services. It also cites around 1,800 PCB-related service providers and around 500 academic departments engaged in electronics design in the US alone. While smaller teams of designers will probably continue to outsource prototyping to third parties, larger teams spending US$100k or more per annum on prototyping constitute a key target segment for Nano Dimension. For these teams, purchasing a DragonFly system for c US$200k gives a short payback period. Another key target segment is companies offering prototype services. Many of these prototyping bureaux located in North America, Europe and Israel may have had their own processing equipment historically, but now act only as intermediaries between designers and print shops in the Far East. We note that a significant proportion of the companies participating in the beta-phase programme (see below) were either involved in defence and other sectors where protection of IP is critical, or were PCB design bureaux.

## Scoping potential – bottom-up approach

**Exhibit 3: Summary of Nano Dimension's survey results**

| Respondents who: | | Amount spent annually on prototyping | |
|---|---|---|---|
| Use external prototyping services | 91% | US$100k+ | 16% |
| Require multi-layer circuits | 66% | US$50-100k | 14% |
| Are concerned about IP security | <67% | US$10-50k | 37% |
| | | <US$10k | 33% |

Source: Nano Dimension data, October 2016.

Nano Dimension has already received over 7,000 enquiries for the DragonFly. Around 1,000 of these contacts, gathered from 31 industries and disciplines and 25 countries, participated in a survey, giving some indication not of the total available market but of likely actual interest in DragonFly in the medium term. This is helpful for assessing potential uptake given that the market does not exist yet, so there are no data regarding its size. Nano Dimension is focusing initially on those businesses spending US$100k or more annually on prototyping services, as these will benefit from the shortest payback time (around two years). If we assume that the survey is a representative sample of PCB designers, then an estimated 160,000 of the million designers globally will be in teams that spend more than US$100k each year on prototyping. If we assume that these engineers are based in teams with an average of 12 engineers each, this represents a market opportunity of 13.3k PCB prototyping systems. Adding the 1,800 US-based service providers and 500 academic establishments noted above gives a total available market of 15.6k PCB printing systems. This estimate excludes service providers and academic establishments outside the US.

## 3D print competitors

Our analysis of the competitive environment indicates that there are currently only two other companies that offer 3D printers intended for PCB prototyping. These two, BotFactory and Voltera, are not able to manufacture multi-layer boards because they do not have the ability to print the insulating material that separates the conductive traces in different layers. Also, since neither BotFactory nor Voltera uses inks with as high a level of conductivity, they cannot produce circuits with very fine traces. As neither can be used to manufacture complex boards, they command a lower price point than the DragonFly, which is the first 3D printing system to reach IPC (formerly Institute of Printed Circuits, now Association Connecting Electronics Industries) standards for PCBs. Nano Dimension is thus able to target a more sophisticated user base.

The other 3D printers listed in Exhibit 4 are intended for structural electronics applications (see below), not PCB prototyping, and lay down multiple layers of filaments, not inks. Even if these printers are combined with software for converting PCB designs to 3D print instruction and a conductive filament for depositing electrical tracks, the relatively poor conductivity of the filament means that the minimum trace width is, in our opinion, insufficiently fine for the finished board to be of use to anyone other than hobbyists. The use of specially formulated conductive inks distinguishes the DragonFly from conventional 3D printers that have been adapted to use conductive pastes. These can only produce single-layer circuits with fairly thick traces, which appear to be only suitable for hobbyists. None of the printers listed appears to be shipping in volumes exceeding several dozen annually.

**Exhibit 4: Competitive prototyping equipment**

| | Number of layers | Minimum line width | Cost | Availability | Comments |
|---|---|---|---|---|---|
| Nano Dimension DragonFly 2020 | <17 PCB | 90 micron | $150k** | Now | Two inks – one conductive, one insulating |
| BotFactory Squink | Two*-layer PCB | 254 micron | $5k | Now | Patterns solder paste and places components |
| MGI Group CeraPrinter | 3D object with embedded wiring | 150 micron | $400k | Now | Some equipment incorporates Optomec technology |
| Mutracx Lunaris | Inner layers only | 100 micron | Unknown | Now | Volume PCB manufacture |
| Optomec Aerosol Jet | 3D object with embedded wiring | N/A | Unknown | Now | Also 3D printing of metals and biological material |
| Voltera V-One | Double-sided PCB | 200 micron | $3k | Now | Patterns solder paste and heats for reflow stage for surface mount components |
| Voxel8 | 3D object with embedded wiring | 250 micron | $9-17k | Now | Also 3D printing of medical products, athletic textiles and footwear |
| Xerox | 3D object with embedded wiring | N/A | N/A | Under development | Using conductive filaments to create traces |
| LPKF mechanical milling | <Eight-layer PCB | 100 micron | $6-17k | Since 1990s | Additional steps needed for multi-layer boards |
| LPKF laser milling | <Eight-layer PCB | 50 micron | $100k | Now | Additional steps needed for multi-layer boards |
| LPKF laser transfer printing | Individual layers | Unknown | Unknown | Now | Currently being sold for antenna production but could be used for printing individual PCB layers |

Source: Edison Investment Research, information from company websites. Note: *users encouraged to experiment with more than two layers. **Average selling price to end-user.

## In-house prototyping using PCB milling techniques

Until the application of 3D print technology to PCB prototyping, design teams wanting to manufacture prototypes in house would use dedicated milling equipment to process individual layers forming a PCB. Older technology (LPKF, MITS, T-Tech) uses mechanical cutting tools to scrape away the unwanted copper from each layer. Newer technology (LPKF) uses lasers to remove the unwanted copper. Laser-based equipment gives a higher resolution but is much more expensive. Importantly, additional equipment is needed to plate the vias, cut the circuit to size, and to align and press the individual layers to make a multi-layer circuit. This adds complexity to the prototyping process. Some of these steps involve dangerous chemicals and are not appropriate for a design environment.

The advantages of Nano Dimension's system compared with PCB milling are:

- Electrical contact is made when a conductive trace from a lower layer meets a trace on the layer above, so there is no need to drill holes and plate through them to create vias. This eliminates the use of hazardous chemicals used in through plating, which are out of place in a design environment.
- The layers are built up in a single process so there is no need to align them and press them together to create a complete multi-layered board.
- The inks are deposited as a circuit of the correct size and shape, so there is no need to cut unusually shaped circuits out of a rectangular substrate.
- PCBs with fine traces may be manufactured without needing to locate bulky equipment in a clean-room environment.

# On the cusp of commercialisation

The previous 12 months have been an exciting time for Nano Dimension as it has passed successive milestones en route to commercialisation in line with management's stated schedules. It has proved that the technology can work in a customer environment and is able to accelerate PCB turnaround times and enhance IP security. The next few months are critical, as this is when the company will commence commercial shipments, thus confirming it is able to deliver on our estimates and, importantly, validating the company's pricing strategy and business model.

**Exhibit 5: Key milestones to commercialisation**

| | |
|---|---|
| Delivery of first printer to customer for onsite beta test | Delivered August 2016 |
| Delivery of printers to beta-test customers in Silicon Valley | Delivered Q416 |
| Financing to fund expansion of ink production | Completed September 2016 |
| Receipt of first revenues from beta-test customers | Q416 |
| Delivery of final printer for beta-phase testing | June 2017 |
| Completion of expansion of ink production | H217 |
| Deliveries of commercial version of DragonFly and receipt of associated revenues | H217 |

Source: Edison Investment Research

## Scaling up production

### In-house ink production facility constructed

The inks are currently manufactured in house. So far, Nano Dimension has not needed large volumes of ink, but this will change once the company starts to deliver printers for commercial use later in 2017. Since the formulation of the inks is a key differentiator, Nano Dimension is investing US$1.5m, most of which capital expenditure will occur in FY17, in expanding its ink production capability ahead of the commercial launch. The construction phase of the project is finished and management expect the permitting phase to be completed within a few weeks. The production equipment required for the early commercialisation phase is already in place elsewhere in the building, so management is confident that everything will be in place to support ink production for the onset of commercial deliveries.

### Flex set up to provide outsourced manufacturing of printer

In January 2016, Nano Dimension announced that it had an agreement with Flex to manufacture the DragonFly. This means that there is no limitation on production volumes or risk in scaling up to commercial volumes. Flex's staff have already been trained so that they are poised to commence production when required. (This scaling-up process does involve significant risk. We note the possibly terminal challenges faced by a potential rival, the start-up Cartesian Co, which attempted to build printers in house and experienced severe problems with suppliers.)

## Distribution and sales network in place

Nano Dimension is addressing the market through a combination of direct sales and distribution agreements. In March 2016, it signed an agreement to collaborate with FATHOM to distribute the DragonFly in Silicon Valley and the greater West Coast area. FATHOM (70+ employees) is an advanced manufacturer, distributor and service provider with expertise in 3D printing. In September 2016, FATHOM became the first beta phase site in the US. So far in 2017, it has announced collaborations with distributors in the UK and Ireland, Canada and Australia. During H217, it intends to establish a sales office in the US West Coast San Francisco Bay area. This will become the main sales office as the US is a key market. Six of the 16 beta-phase customers are US-based.

## Beta-phase completed successfully

A beta version of the 3D printer was shown at the Printed Electronics USA trade show in November 2015 and at CES in January 2016. Then, between August 2016 and June 2017, Nano Dimension delivered 16 printers to customers participating in the beta-phase test programme. As well as the US distribution partner mentioned above, participants in the programme include: four companies involved in the defence sector; a US-based Fortune 100 multinational in the technology sector; one of the 10 largest bank holding companies in the US, which has installed the printer in its hardware development centre; a medical device company; a smart transportation company; and a solar energy company, all of which are very keen to protect their IP. Other participants include one of the 10 largest PCB manufacturers globally, one of the top 10 contract manufacturers globally and three PCB design bureaux in Israel, all of which are interested in the fast turnaround times that the technology offers. The majority of these customers have been paying to lease the printers during the beta phase, providing a useful source of income. They have also provided valuable feedback to direct further product development, which has enabled Nano Dimension to upgrade and refine the technology, printing capabilities and work processes of the DragonFly printer. In July, management noted that it had sufficient beta-phase partners and intended to move to early commercial sales of printers and related proprietary inks during H217.

The feedback so far has been mainly positive. Customers have been using the printers extensively, in some cases manufacturing five or six PCBs each week with the equipment. The customers have successfully made PCBs with up to 12 layers. The beta testing uncovered some minor problems, mainly software functionality, which have been fixed. The resolution of teething problems is to be expected during a beta test phase and highlights why Nano Dimension was keen to have an extended beta test phase with customers that would provide detailed feedback. Nano Dimension notes that the current generation of the DragonFly has been shown to be suitable for the early adopters who will receive the first commercial shipments of the printer. It will continue to make successive modifications to the DragonFly printer and ink formulations so that the system is suitable for wider deployment.

# Future developments: Moving beyond prototyping

Although Nano Dimension is highly focused on moving to the commercial phase of the PCB printer and software, it has made significant progress in developing 3D print systems for other sectors and the next-generation 3D print system for PCBs. Importantly, it is protecting this IP through patent applications. Since it is unlikely that significant R&D effort will be dedicated to launching an alpha-stage demonstration of technology for any of these complementary applications until the DragonFly is shipping in volume, any potential revenues derived from these applications are treated as upside to our estimates and valuation.

## Next-generation PCB printing – structural electronics

In January 2017, Nano Dimension announced that it had successfully 3D printed a series of multi-layered rigid PCBs, connected through printed flexible conductive connections. This process provides a solution to traditional production limitations in the electronics industry, enabling PCBs to be bent so that they fit inside curved and complex geometrical products. Management believes that the company is the first in the world to successfully print multi-layered rigid circuits with flexible connections. The potential market for this solution includes aerospace, defence, wearable equipment and the Internet of Things (IoT).

Later in the same month, Nano Dimension announced that it had successfully 3D printed electrical circuits in which it had inserted embedded electrical components during the printing phase. This technique presents several advantages: it improves the PCB reliability by protecting components from the external environment, it eliminates the soldering process for attaching components to the board and improves connectivity to the components, which is a major source of device failure. Importantly, this represents a step towards printing complete electronic devices where the casing itself supports the electrical components and the connectors joining them, and the shape of the device is not constrained by the need to accommodate a rigid rectangular PCB. This freedom is particularly important for IoT applications, where everyday objects such as prosthetics, spectacles and coffee mugs are turned into smart devices through the addition of electronic sensing, processing and communication chips.

## 3D printing for space applications

In February 2017, Nano Dimension announced that it had received a budget from the Israel Innovation Authority to finance a project to develop 3D printing of advanced ceramic materials. This project is primarily intended to find a better way of manufacturing aerospace and automotive components. In addition, it potentially gives a route for replacing the insulating material in PCBs with ceramic, thus improving the substrate's mechanical and thermal characteristics. This was followed in June 2017 by an announcement regarding another grant from the same body to develop 3D ceramic materials that can be used to print low-density, high-thickness components for space applications. This project will use novel ceramic material precursors from Semplastics, which has been used in prototype space applications for NASA. In June 2017, Nano Dimension announced that it was working with Harris Corporation to develop 3D printing of multi-layer PCBs for space applications. These would be able to distribute digital, power and RF signal on the same substrate, thus reducing the size, weight, power and cost of electronic modules. This project is a step on the road to creating structural electronics for space applications. Both these projects are partly supported by grants from the Israeli Innovation Authority.

## 3D bio-printing

In May 2016, Nano Dimension successfully lab-tested a proof-of-concept 3D bio-printer for stem cells using an adapted 3D printer. The trial was conducted in collaboration with Accellta, which provided the suspensions of stem cells. The combination of Accellta's ability to produce billions of high-quality stem cells per batch and Nano Dimension's high-precision, high-throughput 3D printing expertise opens the possibility of printing complex biomaterials for use in preclinical drug discovery and testing, cosmetics safety testing, toxicology assays, tissue printing and 'organs on chips'. This is already an active market. For example, Organovo is already producing liver models for pharmaceutical testing and is partnering with L'Oréal to produce 3D-printed skin for cosmetics safety testing, while Cellink has a commercial bio-printer and a distribution agreement with Thermo Fisher Scientific. Nano Dimension's adapted printer could potentially make large volumes of tissues and organs more quickly than using other techniques. In June 2016, the company filed a patent in the US covering the conversion of images of organs from MRI and CT scans into a 3D

representation of the biological structure of the tissue and organ, which is then converted into very thin 2D slices for 3D printing. Nano Dimension has stated that it will form a new entity to address this promising application and raise funds separately for it. This will focus initially on creating materials with similar functionality to kidney tissue.

## Management

Nano Dimension's management has a combination of entrepreneurial acumen and experience of 3D technology. Co-founder and CEO Amit Dror is a serial entrepreneur with a background in project, account and sales management across a range of sectors. Co-founder and chief business officer Simon Fried has a background in marketing and sales strategy, management, business development and fund-raising. Co-founder and chief technology officer Sharon Fima is a print technology development expert whose experience encompasses inkjet technology, 3D printer production and nano-silver ink development. Previous positions include advanced research and development management at HP Indigo and XJet.

Chairman Itschak Shrem has more than 40 years of experience in financial markets and venture capital. Non-executive Director Ofir Baharav has held several senior roles at companies in the 3D printing industry, including VP of product portfolio for Stratasys and CEO of XJet. Non-executive director Avi Reichtental, who joined the board in April 2017, was previously president and CEO of 3D print major 3D Systems.

## Sensitivities

The beta testing programme has completed, demonstrating that the current generation of the DragonFly is suitable for the early adopters who will receive the first commercial shipments of the printer. This reduces the technological risk substantially. However, Nano Dimension needs to make further adjustment to the DragonFly printer and ink formulations so that the system is suitable for wider deployment, which still represents material risk. For example, it needs to prove that the technology can provide prototypes of equivalent performance to those manufactured using photolithographic techniques, particularly with regard to compatibility with assembly techniques or lifetime reliability.

There is no guarantee that the new ink manufacturing facility will be able to produce inks economically in volume, although the risk has been reduced by scaling up the production processes as far as is feasible within a laboratory environment.

As Nano Dimension offers a disruptive technology, there are by definition limited data regarding potential market size, so there is significant risk surrounding our assessment of market demand.

As the beta-phase activity only concluded in July, management has only recently focused attention on negotiating commercial sales contracts with potential customers. Quite rightly, in our view, up to this point the focus had been on supporting the technical aspects of the beta phase. This shift has given management greater awareness of the length of sales cycles when dealing with the large corporates that form its initial target market, indicated an appetite for leasing rather than purchasing equipment, and confirmed initial views of pricing. However, there is no certainty that either the proportion of customers leasing equipment assumed in our financial model and indicative valuation or the rate of pipeline conversion will be appropriate. We note the potential impact of widespread adoption of leasing on cash flow.

# Financials: Commercialisation in sight

## H117 P&L

Revenues during H117 totalled US$0.3m. There were no revenues in H116 as printer deliveries did not commence until H216. Revenues were higher in Q217 (US$150k) than Q117 (US$118k), reflecting longer periods of customer use in the second quarter compared with the first quarter. Operating losses almost doubled year-on-year during H117 to US$8.8m. R&D costs increased almost sixfold year-on-year to US$5.8m, partly because the number of employees engaged in R&D rose from 57 in June 2016 to 70 at the end of June 2017, and partly because in H116 US$2.9m of development costs were capitalised. Since Q416, management has expensed all R&D costs. We note that some of these R&D staff are engaged in longer-term programmes such as structural electronics and bio-printing. General and administrative expenses grew by 9% year-on-year to US2.8m, reflecting an increase in payroll and related expenses. The third factor behind the widening loss was US$0.4m amortisation of capitalised development costs, which is chargeable now that Nano Dimension is generating revenues from the IP.

## Forecasts

### Pricing assumptions

Since there is no comparable equipment available, Nano Dimension has used a cost-of-ownership calculation to determine the sales price. Noting that companies in its initial target segment are paying US$100k+ each year on prototyping services, management has set the price paid by end-users per unit at around US$150k for the DragonFly. This price includes installation fees and starter quantities of ink. Management also estimates that established users will purchase US$40k of additional ink annually. This gives a payback period of around two years. Alternatively, since high-tech companies typically write off equipment after four years, purchasing a DragonFly system approximately halves prototyping costs for these companies. From sales discussions so far, this pricing level appears to be appropriate. However we have cut our estimates to reflect a significant proportion of sales being made through distributors from FY18 onwards, which reduces the amount Nano Dimension receives per printer.

### Estimates predicated on timely conversion of sales pipeline

Our estimates assume that Nano Dimension is able to convert the existing enquiry pipeline into a strong position in the PCB prototyping market. Since Nano Dimension has identified large corporates as its initial target market because these have substantial prototyping requirements, contract negotiations with these customers may be longer than originally anticipated and a switch from an outright purchase to a leasing model may be necessary to complete some deals. We therefore reduce the number of commercial-grade printers delivered during H217 from 35 to 24, 13 of which are leased, compared with no leasing in our previous model. It is likely that the majority of these commercial deliveries will be made towards the year-end once sufficient DragonFly systems have been manufactured, contributing to a total of US$2.4m revenues. We also cut the number of printer deliveries in FY18 from 200 to 150 (35 leased).

### Total cost of ownership pricing model should support high margins

As discussed, the printer pricing is based on a total cost of ownership basis, rather than a cost-plus basis, giving a high gross margin. Management also intends to realise high gross margins (c 70%) from ink sales. As the equipment is being purchased by ‘early adopters’ during our forecast period, price erosion has not set in. The company has a low cost base as it is outsourcing printer manufacture. This results in relatively high (60%) total gross margins during FY18.

## Revisions to estimates

We have revised our estimates extensively to reflect:

- reduced average printer price received by Nano because of distributor commissions;
- a more conservative roll-out schedule because of the lengthier sales cycle;
- the introduction of a leasing model; and
- an increase in R&D expenses in line with number of staff at the end of June 2017.

**Exhibit 6: Revision to estimates**

| | FY16 | FY17e | | | FY18e | | |
|---|---|---|---|---|---|---|---|
| | Actual | Old | New | % change | Old | New | % change |
| Printer deliveries | 6 | 50* | 34* | (12.8) | 200 | 150 | (25.0) |
| Revenues (US$m) | 0.0 | 5.2 | 2.4 | (53.6) | 35.7 | 17.8 | (50.2) |
| EBITDA (US$m) | (6.5) | (7.7) | (13.7) | 79.0 | 12.2 | (4.0) | (133.3) |
| PBT (US$m) | (6.8) | (8.8) | (14.7) | 67.1 | 11.0 | (5.6) | (150.4) |
| EPADS (US$) | (0.83) | (0.79) | (1.32) | 67.1 | 0.75 | (0.38) | (150.4) |
| Net cash (US$m) | 12.4 | 16.7 | 9.0 | (45.9) | 27.3 | 2.2 | (91.8) |

Source: Edison Investment Research. Note: *Including beta-phase units.

## Cash flow and balance sheet

Cash totalled US$16.5m at end June 2017 compared with US$12.4m at end December 2016. The balance sheet is debt free. Inventory grew by US$0.2m. The value of tangible assets increased by US$2.2m to US$4.4m, reflecting progress creating the ink manufacturing facility. During H117 the company raised US$13.5m through three placings, each at NIS4.2/ordinary share. We note that the shareholders participating in these placings were not incentivised through the issue of warrants.

Management expects that customers will pay a significant proportion of the US$150k/unit as a deposit, reducing working capital requirements. In addition, production of the DragonFly printer, which will be a standard non-customised model, will be outsourced, reducing inventory requirements. We model a US$1.0m increase in working capital for FY17, and US$0.5m in FY18 as sales ramp up. We expect capex requirements to be high (US$2.5m) in FY17, primarily $1.5m on the new ink facility and US$0.7m on printers for leasing, then to reduce to US$2.2m in FY18, US$1.8m of which is for leased printers. Management estimates that it has sufficient cash to take the group through to break-even, which it anticipates reaching by the end of FY18.

# Valuation: Delivery on milestones is key

We continue to present a DCF calculation for valuation purposes. This adopts the roll-out assumed in our estimates for the first two years, then ramps up revenues through to FY25 as shown in Exhibit 7. Although we have pulled back roll-out during FY17 and FY18 (see Exhibit 6), we have retained the longer-term assumptions regarding market share we previously proposed, leading to 400 units in 2025. Importantly, this sales progression is predicated on Nano Dimension making the step from successful beta test to early commercial deliveries. Our analysis excludes the earlier-stage development initiatives such as structural electronics and human tissue printing.

**Exhibit 7: Revenues from printer and ink sales**

| | 2017e | 2018e | 2019e | 2020e | 2021e | 2022e | 2023e | 2024e | 2025e | 2026e |
|---|---|---|---|---|---|---|---|---|---|---|
| Total units delivered | 34* | 150 | 210 | 273 | 323 | 345 | 366 | 384 | 400 | 408 |
| Price per unit (US$k)** | 150 | 120 | 116 | 113 | 110 | 106 | 103 | 100 | 97 | 94 |
| Revenues from equipment sales and leasing (US$k) | 2,280 | 15,630 | 26,934 | 31,874 | 35,341 | 36,680 | 37,715 | 38,412 | 38,750 | 38,377 |
| Revenues from ink sales (US$k) | 115 | 2,128 | 5,213 | 8,816 | 12,751 | 16,605 | 20,577 | 24,360 | 27,919 | 31,198 |
| Total revenues (US$k) | 2,395 | 17,758 | 32,147 | 40,690 | 48,092 | 53,286 | 58,292 | 62,772 | 66,669 | 69,575 |

Source: Edison Investment Research. Note: *Including beta-phase units. **After commissions to distributors.

## DCF assumptions for PCB prototyping sector

- Ramp-up in sales to 400 DragonFly units/year by FY25. This is in line with management's target, which it has recently reiterated and is based on the market analysis presented on page 5. Together with ink sales, this totals US$66.7m annual revenues, US$17m EBITDA, which we estimate is equivalent to 0.08% of the total global PCB market at that point and only 8% of the total available annual market of US$836m (as discussed in our top-down approach on page 5.) Ink sales are linked to the cumulative number of printer sales, so these are substantially lower than in our previous model because of the slower ramp-up, even though the number of printer deliveries in later years is not changed. Note: A ramp-up to 360 printer deliveries in 2025, 10% less than our base case gives an indicative valuation at 12% discount of US$4.80/ADS (NIS3.45/ordinary share) compared with our base case of US$7.04/ADS (NIS5.06/ordinary share. A ramp-up to 440 printer deliveries in 2025, 10% higher than our base case gives an indicative valuations of US$8.39/ADS (NIS6.03/ordinary share).
- Cumulative unit sales of 2.5k by end FY25 (less than half of the number of enquiries regarding the DragonFly system that have already been received and 16% of our estimate of the total available market of 15.6k PCB systems, as discussed in our bottom-up approach on page 6).
- Average price per DragonFly printer reduces sharply in FY18 to reflect potential commission to distributors, 3% per annum thereafter.
- Gross margin of 57% and EBITDA margin of 25% in FY25. This is relatively high, reflecting the high gross margins management expects to achieve for the proprietary inks, combined with low sales costs for repeat ink sales. Inks constitute a higher proportion of total revenues as the installed base gets bigger. Capital expenditure is modelled broadly in line with depreciation, other than a total of US$4.0m invested in further expansion of the ink production capacity between FY19 and FY25. Note: A 10pp reduction in ink gross margin gives an indicative valuation at 12% discount of US$5.85/ADS (NIS4.21/ordinary share).

**Exhibit 8: Edison DCF valuation sensitivities against discount and terminal growth rates**

| | US$/ADS | Discount rate | | | NIS/ordinary share | Discount rate | | |
|---|---|---|---|---|---|---|---|---|
| | | 10.0% | 12.0% | 14.0% | | 10.0% | 12.00% | 14.0% |
| Terminal growth | 0.0% | 8.01 | 6.35 | 5.21 | 0.0% | 5.76 | 4.56 | 3.74 |
| | 1.0% | 8.55 | 6.66 | 5.40 | 1.0% | 6.15 | 4.79 | 3.88 |
| | 2.0% | 9.22 | 7.04 | 5.63 | 2.0% | 6.63 | 5.06 | 4.05 |
| | 3.0% | 10.09 | 7.49 | 5.89 | 3.0% | 7.25 | 5.39 | 4.24 |
| | 4.0% | 11.24 | 8.07 | 6.21 | 4.0% | 8.08 | 5.80 | 4.47 |

Source: Edison Investment Research

While the successful completion of the beta phase removes a substantial part of the technical risk previously associated with this stock, there remains significant executional risk with regard to the volume ramp-up, which will not be reduced until the first commercial deliveries commence later this year. We therefore reduce our discount rate a little, from 13% to 12%, and keep the terminal growth rate of 2%. This gives an indicative share price at current levels of risk of NIS5.06/ordinary share (US$7.04/ADS) (previously NIS8.99/ordinary share or US$12.47/ADS). The share price has dropped by around 20% since the Q217 results were announced, and is now NIS3.50/ordinary share (US$4.85/ADS), substantially below our indicative valuation. In our opinion, this reflects investor concerns on how long it will take to win meaningful sales volumes once the commercial version of the printer is available later this year. Our reverse DCF indicates that the current share price implies an even more conservative roll-out, reaching only 350 units/year in 2025 (US$58m revenues, US$12m EBITDA) and a cumulative total of 2.2k units, c 88% of our forecast of 2.5k.

If Nano Dimension continues to deliver on the major milestones we have set out, investors will gain confidence that the sales ramp-up presented in our estimates and valuation is achievable and we expect the share price to start to move past our indicative value towards the risk-free (10%

discount) level. However, while the current share price appears to already factor in some delays, a severely delayed onset of commercial sales may cause the share price to decline further.

**Exhibit 9: Financial summary**

| US$000 | 2015 | 2016 | 2017e | 2018e |
|---|---|---|---|---|
| Year-end 31 December | IFRS | IFRS | IFRS | IFRS |
| PROFIT & LOSS | | | | |
| Revenue | 0 | 46 | 2,395 | 17,758 |
| Cost of Sales (including amortisation of capitalised IP) | 0 | (193) | (1,843) | (7,104) |
| Gross Profit | 0 | (147) | 553 | 10,654 |
| EBITDA | (2,437) | (6,465) | (13,720) | (4,047) |
| Operating Profit (before amort. and except.) | (2,473) | (6,829) | (14,704) | (5,555) |
| Intangible Amortisation | 0 | 0 | 0 | 0 |
| Exceptionals | 0 | (149) | 0 | 0 |
| Other | (3,262) | (2,025) | (2,025) | (2,025) |
| Operating Profit | (5,735) | (9,003) | (16,729) | (7,580) |
| Net Interest | 355 | 38 | 0 | 0 |
| Profit Before Tax (norm) | (2,118) | (6,791) | (14,704) | (5,555) |
| Profit Before Tax (FRS 3) | (5,380) | (8,965) | (16,729) | (7,580) |
| Tax | 0 | 0 | 0 | 0 |
| Profit After Tax (norm) | (2,118) | (6,791) | (14,704) | (4,666) |
| Profit After Tax (FRS 3) | (5,380) | (8,965) | (16,729) | (7,580) |
| Average Number of Shares Outstanding (m) | 5.4 | 8.2 | 11.2 | 12.3 |
| EPADS - normalised (c) | (39.49) | (83.30) | (131.87) | (38.05) |
| EPADS - normalised fully diluted (c) | (39.49) | (83.30) | (131.87) | (29.63) |
| EPADS - (IFRS) (c) | (1.00) | (1.10) | (1.50) | (0.62) |
| DPADS (c) | 0.0 | 0.0 | 0.0 | 0.0 |
| Gross Margin (%) | N/A | N/A | 23.1 | 60.0 |
| EBITDA Margin (%) | N/A | N/A | N/A | -22.8 |
| Operating Margin (before GW and except.) (%) | N/A | N/A | N/A | -31.3 |
| BALANCE SHEET | | | | |
| Fixed Assets | 4,151 | 8,903 | 10,463 | 11,105 |
| Intangible Assets | 2,910 | 6,787 | 6,021 | 5,255 |
| Tangible Assets | 1,131 | 2,006 | 4,332 | 5,740 |
| Restricted deposits | 110 | 110 | 110 | 110 |
| Current Assets | 9,057 | 13,323 | 11,570 | 9,929 |
| Stocks | 0 | 0 | 1,000 | 1,500 |
| Debtors | 264 | 814 | 1,414 | 6,070 |
| Cash | 8,665 | 12,379 | 9,026 | 2,229 |
| Restricted deposits | 128 | 130 | 130 | 130 |
| Current Liabilities | (907) | (1,968) | (2,568) | (7,224) |
| Creditors | (907) | (1,968) | (2,568) | (7,224) |
| Short-term borrowings | 0 | 0 | 0 | 0 |
| Long-Term Liabilities | (254) | (956) | (1,376) | (688) |
| Long-term borrowings | 0 | 0 | 0 | 0 |
| Liability in respect of government grants | (254) | (956) | (1,376) | (688) |
| Net Assets | 12,047 | 19,302 | 18,089 | 13,122 |
| CASH FLOW | | | | |
| Operating Cash Flow | (3,330) | (5,914) | (14,300) | (4,647) |
| Net Interest | 0 | 0 | 0 | 0 |
| Tax | 0 | 0 | 0 | 0 |
| Investment in intangible & tangible assets | (2,344) | (4,167) | (2,544) | (2,150) |
| Acquisitions/disposals | 0 | 0 | 0 | 0 |
| Financing | 14,362 | 13,525 | 13,491 | 0 |
| Dividends | 0 | 0 | 0 | 0 |
| Net Cash Flow | 8,688 | 3,444 | (3,353) | (6,797) |
| Opening net debt/(cash) | (207) | (8,665) | (12,379) | (9,026) |
| HP finance leases initiated | 0 | 0 | 0 | 0 |
| Other | (230) | 270 | 0 | 0 |
| Closing net debt/(cash) | (8,665) | (12,379) | (9,026) | (2,229) |

Source: Nano Dimension accounts, Edison Investment Research

| Contact details | Revenue by geography |
|---|---|
| 2 Ilan Ramon Street,<br>Ness Ziona 7403635<br>Israel<br>+972 73 7509142<br>www.nano-di.com | N/A |

**Management team**

| Chairman: Itschak Shrem | Co-founder and Chief Executive Officer: Amit Dror |
|---|---|
| Mr Shrem has more than 40 years' experience in financial markets and venture capital. He has been the managing director of Yaad Consulting since 1995. He is also chairman of BreedIT Corp, director of Eden Spring and Globe Oil Exploration, and is on the board of several high-profile public institutions including the Tel-Aviv Sourasky Medical Center and the Weizman Institute. He was appointed chairman of Nano Dimension in April 2014. | A project leader with extensive experience in company and account management, Mr Dror has a background that covers technology management, software, business development, fund-raising and complex project execution. Previous positions include executive roles with ECI Telecom, Comverse, Eternegy and Milk & Honey Distillery. He was appointed chief executive in August 2014. |
| **Co-founder and Chief Business Officer: Simon Anthony-Fried** | **Co-founder and Chief Technology Officer: Sharon Fima** |
| Mr Anthony-Fried has worked extensively on global projects in both the B2B and B2C markets driving significant strategic change to global marketing organisations. He was a co-founder of Diesse Solutions, a project management, risk and marketing consultancy, serving as its chief executive officer from 2004 to 2014. He is also director of the Milk & Honey Distillery. He was appointed to his current role in August 2014. | Mr Fima's expertise encompasses digital printing technology, inkjet technology, 3D printer production and nano-silver ink development. Previous roles include integration team manager at HP Indigo from 1999 to 2008, production manager at Xjet from 2008 to 2009, before moving to integration R&D manager, a role he held until 2013. He was appointed to his current role in August 2014. |

| Principal shareholders | (%) |
|---|---|
| Ayalim Trust Fund | 5.6 |
| HaPhoenix Group | 5.4 |
| Michael Ilan Management & Investment | 5.0 |
| Amit Dror | 3.5 |
| Simon Anthony-Fried | 3.5 |
| Itschak Schrem | 2.3 |
| Sharon Fima | 1.8 |

**Companies named in this report**

3D Systems (DDD:US), Cellink (CELLNK:SS), Flextronics (FLEX:US); Harris Corp (HRS:US); LPKF Laser & Electronics (LPK:GR); NICE (NICE:US); Organovo Holdings (ONVO:US); Stratasys (SSYS:US); Thermo Fisher Scientific (TMO:US)

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