

Zacks Small-Cap Research

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IDEX Biometrics ASA (OTCQB: IDXAF)

IDXAF: A Pure Play in Next-Gen Biometric Payment Cards

We are valuing IDEX on 2025 revenues discounted to today using the average EV/Sales of other fabless semiconductor companies that trade at 10.1 times 2021 estimated sales.

Current Price (01/29/21) \$0.29
Valuation \$1.00

OUTLOOK

IDEX Biometrics is a Norwegian-headquartered fabless semiconductor company largely operating from the US with a US based senior management team that provides hardware and software systems to create biometric fingerprint protected payment cards and other smart card solutions. Next generation payment cards are being piloted and should start to ship in volume at the end of this year. The networks that process 45% of cards worldwide have already certified its technology. Its solution results in a payment card cost that is 30-50% less expensive than cards built with the competition through leading-edge design and is protected by IP. Without legacy product to cannibalize, IDEX provides a pure play in fingerprint based biometric solutions.

SUMMARY DATA

52-Week High \$0.40
52-Week Low \$0.19
One-Year Return (%) 101
Beta 2.6
Average Daily Volume (sh) 8,083

Shares Outstanding (mil) 832
Market Capitalization (\$mil) \$241
Short Interest Ratio (days) 0.8
Institutional Ownership (%) 5.4
Insider Ownership (%) 19.1

Annual Cash Dividend \$0.00
Dividend Yield (%) 0.00

5-Yr. Historical Growth Rates
Sales (%) N/A
Earnings Per Share (%) N/A
Dividend (%) N/A

P/E using TTM EPS N/M
P/E using 2021 N/M
P/E using 2022 N/M

Risk Level High
Type of Stock Small-Growth
Industry Elec. Comp-Semi

ZACKS ESTIMATES

Revenue

(in millions of \$)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	0.2 A	0.0 A	0.1 A	0.1 A	0.4 A
2020	0.1 A	0.1 A	0.2 A	0.6 E	1.1 E
2021	0.7 E	0.8 E	1.2 E	2.3 E	5.0 E
2022					20.0 E

Earnings Per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	-0.014 A	-0.013 A	-0.013 A	-0.022 A	-0.053 A
2020	-0.009 A	-0.009 A	-0.009 A	-0.008 E	-0.035 E
2021	-0.009 E	-0.009 E	-0.008 E	-0.007 E	-0.033 E
2022					-0.023 E

Zacks Projected EPS Growth Rate - Next 5 Years % N/A

KEY POINTS

- IDEX Biometrics was founded in Norway in 1997 and has since 2014 largely become a US centric product company with extensive expertise in fingerprint biometrics and semiconductor and systems design. It is a fabless semiconductor company that targets primarily the payment card industry and is just starting to ship production volumes of its next generation sensors and solutions to major card providers.
- Next generation credit cards will have fingerprint authentication embedded sensors and chips. Importantly this generational switch will not require new POS equipment as with chip and PIN and should occur much faster. This technology is expected to reduce fraud and increase usage easily providing payback for banks even with the incremental cost. IDEX's unique patent-protected "*off-chip*" design allows cards to be manufactured at less than half the price of competitors by separating the fingerprint sensor from its controller chip thus allowing the use of a smaller, newer, and more powerful chips.
- Despite the existence of smartphone-based payment systems, market researcher Nilson still believes the market for payment cards will increase 7.3% per year. There are 23.6 billion payment cards in use globally. Biometric payment card units are expected to grow from 2 million shipped in 2021 to a minimum of 400 million by 2024. IDEX could receive \$3 per card of the market share it captures.
- IDEX has already had its design certified by two out of the three major card networks, MasterCard and China UnionPay, who process over 45% of the cards in use worldwide. It has begun to provide cards in small quantities to card issuers to sample and conduct pilots at banks in various countries.
- It has more than \$7 million of revenue under contract, all booked in 2020, and is now shipping against these orders. In 2021 we expect the company will be providing product to many of the major card providers who in turn will sell to their customers worldwide. In addition, it will be selling production volumes to customers in the secure access control business and other applications such as IOT.
- The company trades on the Oslo Børs and the OTCQB but has recently filed an F-1 to list its ADSs on NASDAQ.
- As a fabless semiconductor company with high operating leverage, it is expected to be at very high pretax margins once it ramps revenues and it deserves an enterprise value to sales valuation in line with its peers that trade at 10.1 times. It currently trades at \$241 million market cap. We believe that by 2025 it has the potential of \$500 million in sales at which point it could be valued as a \$5 billion company.

OVERVIEW

IDEX Biometrics was founded in 1997 and is headquartered in Norway. The company has 94 employees and currently operates from offices in Wilmington, MA and Rochester, NY (54 employees), Farnborough, UK (37), Shanghai China (8), and Norway (1). It files financials in Norway and is listed on the Oslo Bors and OTCQB exchanges. The company applied to be listed on NASDAQ in October under the ticker IDBA. As a result, it has begun to file in the US with the SEC including a prospectus filed in October of 2020.

It sells its system solutions which include fingerprint sensors, chips, and the software to make them function, to companies that incorporate fingerprint identification technology into their products. IDEX is targeting primarily the payments card market including contactless debit and credit cards. The company also supplies its products for access control and IoT. It has developed a unique design that fits the specific parameters required for cards including energy harvesting and low power operation at industry leading costs. Its main competitor is Fingerprint Cards AB (FPC) of Sweden, who has participated in more pilots with partners but is offering an older, more expensive, larger, and kludgy solution. IDEX believes customers will see its cost and design advantages and it will capture large market share in this nascent industry.

TECHNOLOGY



Source: Shutterstock

While fingerprint authentication has a lot of advantages, both the challenges and cost to get that technology functioning in a card have been high. A smartphone can do it easily because of all its processing power. It can use a small sensor and take a tiny part of a fingerprint and extrapolate that into a match with the information it has stored on the phone. With a large on-board battery it also has abundant power to access to complete this biometric processing. Cards are more difficult. A card has no power source (although earlier renditions tried to integrate batteries) and it must be inexpensive, thin, and highly durable. Since the card derives the energy to power the transaction from the POS terminal on which it is used, no battery is required.

Current dual interface cards (chip and PIN technology or contactless) cost about \$2.50 a card to a bank. To pay more than that, the issuer needs compelling reasons. Competitors to IDEX enable biometric card solutions that cost a bank issuer about \$10-\$15 per card, IDEX's highly integrated system design enables biometric cards that can be sold to an issuer for only \$5. At \$5 a card, biometric card usage can be more easily justified over standard contactless cards from fraud reduction alone, but there are many other advantages including consumer demand for touch-free payments, identity protection, and transaction convenience. Biometric authentication virtually eliminates card-present fraud, as its owner can only use the card. In addition, the card cannot be skimmed or used in PIN theft attacks.

The integration level of IDEX's solution drives this difference in card cost. A card based on a small number of highly integrated devices is lower cost and easier to manufacture than a card based a large number of separate electronic components.

The competition uses an all-silicon sensor technology, which integrates the sensing area array directly into the silicon controller chip. However, in order to control cost, they have to use older semiconductor technologies that are not suited to large-scale integration of biometric processing functions. Because of this, a silicon sensors' only function is to capture a simple image of the fingerprint and designers face constant pressure to reduce both chip size and sensing area due to cost.

The downward pressure in sensing size that the silicon sensor faces makes this sensor technology harder and harder to apply in the biometric smartcard application. Because the card does not have the processing power of a phone, it helps to have a large fingerprint sensing area to capture as much of the finger as possible – this is at odds with the downward pressure on silicon sensor size. This large sensing

area approach enables the biometric processing in the card to be both quick and power efficient, ensuring a good user experience with a low-power battery-free design.

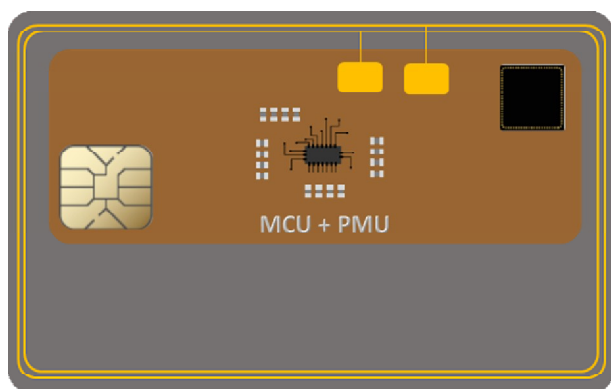
In contrast to the shrinking silicon-sensor, the IDEX off-chip sensor separates its silicon controller chip from the sensor array in a way that enables both a large sensing area and the use of a small silicon chip. This approach allows the use of advanced semiconductor technology where more functionality and highly efficient biometric processing can be built into the fingerprint sensor. Since silicon costs more than an order of magnitude per unit area than an off-chip sensor substrate, it is far more cost effective to reduce the chip size (and thus over all solution price) than the sensing area.

IDEX designs its own silicon controller chips in advanced 40nm technology fabricated and manufactured by TSMC. To form an overall sensor companies such as Amkor place this controller chip on a low-cost substrate with a standard packaging process. When combined with its on-board software running advanced biometric authentication algorithms the IDEX off-chip sensor is then shipped to card manufacturers who will add the standard secure element chip from one of the companies such as: Infineon, NXP, STMicro, Tongfang, or Fudan Microelectronics to form the overall biometric smart card.

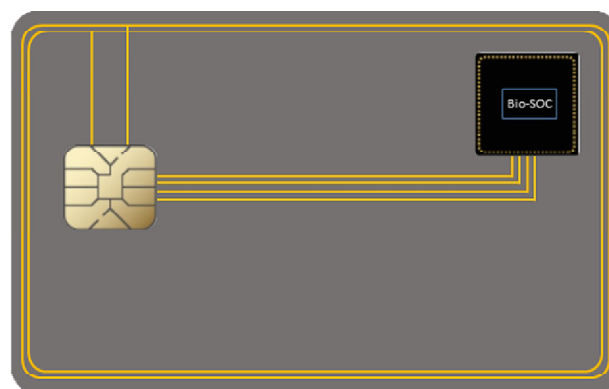
The IDEX solution enables a far lower system cost by separating the sensor from the chip and integrating more separate components.

- First, the IDEX off-chip sensor enables a much **smaller silicon controller chip** than competing silicon sensors, since it uses a low-cost flexible plastic substrate for its off-chip sensing array
- Second, the IDEX off-chip sensor allows it to use advanced silicon technology in its controller chip thereby **enabling integration of other components and functions**
- Third, this highly integrated approach enables **significant reductions in card cost and manufacturing complexity**

Competitor's Complex Design



IDEX Simple Design



Source: IDEX Biometrics

IDEX has a broad IP portfolio encompassing 133 granted patents and very defensible IP both with its design and its enrollment sleeve methodology, which it licenses for ten cents per card to other companies if they are not customers of IDEX. When a consumer gets this new card in the mail, they slide it into a cardboard or plastic sleeve which merely contains a battery and must be touched six times to log the fingerprint onto the card. The fingerprint array is never stored on a network. The sleeve can be used to enroll several cards in the same household before it is discarded. Previous generations required having

the customer to go to the issuing bank and enrolling on specific hardware, a clear fail all around. To see the enrollment process, watch [Idemia's video](#).

APPLICATIONS

IDEX focuses its sales efforts on largely card applications where its unique patented off-chip technology has clear advantages. Clearly payment cards have the biggest potential volumes but IDEX also has customers in the security access space. It can be used beyond those two verticals and can be applied to any situation where use should be restricted to a specific individual. Access and payment could also be combined, for example, on campuses. As an example, the Georgia Tech Buzzcard lets students pay for dinner and laundry as well as open the front door of the dorm, but it has no security at all and anyone can use the card if it is lost or stolen. Being fingerprint enabled would stop illegal building access as well as illegal payments on the card. A further integration could be replacing the manual keys on to room doors with this technology making that also contactless and removing another labor-intensive system. Other possible applications are found in the Internet of things. A card could limit access to authorized or licensed users of tools and vehicles and in the case of its client Bloomberg, be built into hardware to protect subscription services.

Payment Cards

According to Nilson, there are three main card processing networks globally who account for approximately 59% of payment cards worldwide: VISA, Master Card, and China Union Pay. IDEX has been certified by the latter two and hopes to be certified by VISA in 2021. The credit card manufacturing business is dominated by three Tier 1 players: Thales Gemalto, Giesecke + Devrient (G&D) based in Germany, and IDEMIA of France. IDEX is already designed into cards at IDEMIA and it is in discussions with the other two.

Advantages of Biometric Cards for Payments

Currently fingerprint biometrics is the only type of biometric in use on a card due to the low amount of processing power available and lower cost sensor required. The fingerprint replaces the PIN. The fingerprint is not transferrable like a PIN is and it provides better security **restricting use to the one person** with the correct fingerprint.

During this pandemic year, contactless payments have grown as they allow transactions without touching anything touched by anyone else as long as the merchant allows them to be used without a PIN. This is usually limited to smaller dollar volume transactions. Contactless payments using a card give rise to greater fraud as a lost or stolen card can then be used by anyone. Biometric cards allow **contactless payments** without a PIN, but cannot be used by others as the fingerprint authorizes the transaction. Thus the merchant can accept any size transaction without the fear of fraud.

A biometric card cannot be skimmed. It has no biometric data on its mag stripe and the PIN code theft associated with today's skimming attacks does not apply for biometric authenticated transactions. According to the FBI, skimming costs banks and consumers \$1 billion a year. According to The Nilson Report, worldwide card fraud losses were \$28.7 billion in 2019 and are projected to rise to \$38.5 billion by 2027. According to Experian, 22% of surveyed victims said the fraud occurred while shopping at a retail store.

Nilson breaks down major fraud categories to:

- criminals taking over existing card accounts
- lost, stolen or counterfeited cards

- synthetic fraud when new accounts are opened using a mix of valid and/or completely false information
- friendly fraud when cardholders or their family members make purchases that they subsequently dispute

65% of the losses due to fraud were from card-not-present transactions, which include purchases made with mobile devices, meaning 35% was with card present. Clearly fingerprints reduce fraud from lost or stolen cards, make counterfeiting cards more difficult, and curbs friendly fraud when card usage is limited to a single person. In future generations, if information is only shown on a display that is activated with a fingerprint, even more fraud can be eliminated.

Security and Access Cards

In addition to bank cards there are other uses for biometric cards. IDEX has orders from companies that provide access cards. Biometric cards can be used to replace current technology and provide more secure as well as a contactless solution especially in an environment where people are hesitant to touch things other people have touched. For example, employees or students entering a building might touch a keypad at a turnstile or use a fob to unlock a door. Using IDEX enabled biometric cards, the user would not need to touch the keypad, but just use the card and touch that. Also integrating fingerprint into an ID card could eliminate fobs. This would eliminate an entire piece of hardware by combining access into the ID card, and it would prevent others from using the card both for entry as well as paying. Since the issuer individualizes each card, each person would have buildings or rooms they are allowed to enter that is unique to their permissions.

What's Next?

In addition to new applications, the company continues to press forward with better and cheaper technology as well as new features for cards that would drive the adoption of a next generation. For example, the company is working to add a display, on which information would appear with a fingerprint touch. While being touched the card could show a signature for matching or a picture of the owner or even the credit card number. In fact, with a hidden display, the card could be completely blank and all the information could appear only after being touched. This not only prevents fraud, but also certainly generates a cool factor that would make the card highly sought by consumers thus reducing customer acquisition costs for a bank.

Current Orders

The company has \$7 million of revenue under contract all booked in 2020 of which \$6 million is a minimum order from Bloomberg and that make take over two years to fill. The rest are from both credit card manufacturers (IDEMIA), security access card makers (DWA of Korea), and Bloomberg, who uses it to restrict use of their terminals to authorized users with a solution embedded in its keyboards. Backlog is the sum of all the orders received despite the time frame of delivery. For standard products, IDEX customers place purchase orders with standard lead times and delivery terms. IDEX also accepts custom order. Clearly the backlog only reflects the minimum not the maximum or even the expected volumes from each customer signed.

The largest customer that is using IDEX products that are already in the wild and being sold and used by consumers is Bloomberg. Bloomberg accounted for 84% of revenues for the first nine months of 2020 or \$417,000. An IDEX fingerprint sensor is embedded into new Bloomberg keyboards, and a portable card with a sensor—known as a B-UNIT® and approximately the size of a credit card—allows you to access your Bloomberg account from any location using Bloomberg Anywhere on a PC or a mobile device. In Q3

IDEX shipped production revenues from Bloomberg as well as from product shipped to Dongwoon Anatech (DWA) and Ubivelox for testing.

Other than Bloomberg, most customers are in the testing and piloting phase. Once they are done testing they will move to making small batches of cards for pilots with some of their customers. The pilots can take a couple months at which point product will begin to be rolled out to the end users. Bankcards of course will have a somewhat predictable rollout with the same amount being sent out every month as customer's cards expire or are lost and have to be replaced. Typically, an order for IDEX might be \$30,000 for enough product for testing, and \$50,000 - \$100,000 for enough to do a pilot which might involve 100 to 200 cards.

An example of a pilot that IDEX is in is with MasterCard, Idemia, and MatchMove, a fintech based in Singapore. The three are piloting a card for in-store payment transactions in Asia. It was developed by Idemia and is issued by MatchMove. This quarter employees of all three companies are testing the cards.

Other Backlog

It typically takes three months from an order being received until it is shipped and booked as revenue. In September IDEX received its first commercial and volume order from IDEMIA, a tier one global card manufacturer, for its fingerprint sensors. IDEMIA has been testing IDEX products since 2019 and is ready to start pilots and roll outs once CTC certifies the technology. We expect certification in Q1 2021. This certification is important in that it allows legal liability to be transferred from the merchant to the payment network.

Q3 Orders

- Dongwoon Anatech - volume production orders for both its current and next generation, TrustedBio fingerprint sensors. Dongwoon Anatech is a smart card integrator headquartered in Seoul, South Korea. These orders are for DWA's smart identity (ID) cards. This order is a small order in quantities for testing, but since this company makes access control and security cards it does not need to go through the same certifications as bank cards and will be able to roll out products quicker. It should ship in Q4.
- Ubivelox - a production order for its TrustedBio™ products. Ubivelox, headquartered in Seoul, South Korea, is working with IDEX to provide biometric payment cards for its 140+ customer base, which include MasterCard and Visa issuers across the Asia Pacific region. This order is expected to ship in small quantities in Q4.
- Zwipe (ZWIPE.ST) - 300,000 units of TrustedBio™ fingerprint sensors to integrate with Zwipe's PayONE platform. Zwipe is a Norwegian pioneer in contactless payments who sells fingerprint credit cards and watchbands and has partnered with IDEMIA. The order is for its customers to conduct pilots. None of it has shipped yet and the order is expected to be filled throughout 2021.
- Hengbao – a production order for IDX3205 fingerprint sensors. Hengbao is one of the largest smart card companies based in China, and its cards support MasterCard, China UnionPay, VISA, JCB and others, as well as emerging digital currency standards. The order is to create cards for upcoming pilots and it should ship in Q1 2021.

COMPETITION

While IDEX competes with a few companies depending on application its main competitor is **Fingerprint Cards AB (OTC: FGRRF)**. Fingerprint Cards (FPC) is a \$600 million market cap company based in Sweden. In the first nine months of 2020 it generated \$105 million in revenue down from \$127 million in 2019. It sells fingerprint technology and sensors and derives most of its revenues from the smartphone

market. In Q3, Visa certified a biometric payment card from Thales, in which FPC's technology is included. The company claims that this is the first biometric card to be certified by both Visa and MasterCard. In Q3 it announced its new sensor module for cards called *T-Shape* costs \$3 per unit in volume production. It also has partnerships with Infineon and STMicroelectronics for biometric cards that would combine FPC sensors with chip and pin from these two chip suppliers.

NEXT Biometrics ASA (NEXT.OL) is a thirty-person, \$16 million public company traded in Oslo. In the first nine months of 2020 it reported \$5.8 million in revenues. Its patented NEXT Active Thermal principle allows the development of large, high quality fingerprint sensors in both rigid and flexible formats. Its solution is considered power hungry and not as suitable for cards.

Due to security concerns, IDEX believes customers may be hesitant to use Chinese suppliers for biometric authentication. The two major Chinese suppliers are:

ELAN Microelectronics Corp. (2458.TW) is a \$1.4 billion Taiwanese semiconductor manufacturer that sells silicon-based fingerprint sensors to primarily the Chinese market.

Shenzhen Goodix Technology Co., Ltd. (603160.SS) is an \$11 billion fabless semiconductor company that is the largest biometric authentication solution provider for Android devices in the global market. Currently, Goodix product lines cover the areas of biometric authentication, human interface, and IoT.

INDUSTRY OUTLOOK

The global fingerprint sensor market is estimated to be \$3.6 billion in 2020 and is projected to expand at CAGR, of nearly 15% to \$6.7 billion by 2025 according to Zion Market Research.

Fueling much of that growth will be the global market for payment cards. According to market researcher, Nilson, at the end of 2019 there were **23.6 billion** credit, debit and prepaid general purpose and private label payment cards in circulation worldwide. The global brand cards accounted for 62.3% of all payment cards in circulation worldwide. UnionPay cards accounted for 35.6%, Visa 14.6%, and MasterCard 9.2%.



Source: IDEX Biometrics

By 2025, payment cards in circulation worldwide are projected to reach 31.3 billion (a CAGR of 7.3%). Global brand cards in circulation are projected to grow by 5.3 billion, private label cards by 1.6 billion, and domestic-only cards by 0.8 billion.

According to Nilson, 2.7 billion payment cards were shipped in 2019. 81.0% were chip cards, and 19% were mag stripe. ABI thinks that number was 3.2 billion and it will decline to 3 billion in 2020.

A subset of chip cards is cards that facilitate contactless payments. Of that 3 billion of payment cards shipped, 1.9 billion are expected to be contactless according to ABI up 14% from the year before. In Europe, all cards were mandated in 2019 to be contactless so there, 75% of payment card transactions are contactless. **By 2025, it expects 2.8 billion** of the 3.4 billion cards shipped globally will be contactless.

The next generation of payments card technology is using biometrics, which improves security over the current pin and chip generation. Biometric cards are expected to take part of the contactless card market as they are also contactless. If the value of IDEX's content in a card is \$3 per card. The total contactless card market could be an \$8.4 billion market for IDEX content by 2025.

By being so lagging edge, the US may in fact leapfrog going to contactless cards first, straight to biometric cards. The market for biometric cards is tiny now but is about to ramp from an estimated 2 million shipped in 2021. How quickly they ramp is a matter of debate based on cost.

ABI released an extensive report on biometric cards on December 10th that puts forth two growth scenarios based on biometric card costs we feel are much too high. Its best-case scenario is one where card costs are estimated at \$13 per card in 2021 and below \$10 mark achieved as early as 2022. It also assumes the cost ratio between a biometric payment card and a contactless payment card would be 3X or approximately \$6 by 2025. This yielded volumes of 353 million units worldwide by 2025, mostly in Europe and Asia. We find this analysis flawed in that IDEX's solution can already be used to create cards that are priced at \$5 per unit to the bank, making the entire analysis moot. The study also say a cost ratio of 2X, compared to the current ASP of a contactless payment card should be a goal and that \$4 solution would be a viable cost for an issuer to swallow however it does not forecast the volume or percent of market share a solution priced at \$4 would capture.

FINANCIALS

First nine months of 2020

In the first nine months of 2020 the company generated \$497,000 in revenues compared to \$352,000 in 2019, product sales however were \$420,000 in the first nine months of 2020 compared to \$106,000 in 2019 reflecting the beginning of the of production shipments to Bloomberg as well as sample and pilot shipments to card manufacturers. 84% of these sales were to Bloomberg for its new keyboards against its \$6 million minimum contract. These sales yielded a gross margin of 80.5%. Operating loss for the nine months was \$17.9 million compared to a loss of \$21.2 million last year. The net loss was \$19.5 million compared to \$23.0 million, while the non-GAAP loss was \$16.9 million versus \$22.4 million, a decrease of \$5.5 million, as management streamlined operations as it approaches volume ramps.

GAAP loss per share was \$0.03 this year compared to \$0.04 last, and non-GAAP was a loss of \$0.02 versus \$0.04. The share count increased 27.3%.

EBITDA loss in this year's first nine months was \$15.9 million compared to \$19.2 million in 2019. Cash flow (not including changes in working capital) was a negative \$16.4 million compared to a negative \$19.4 million. Free cash flow was almost the same at a negative \$17.0 million compared to \$19.9 million last year.

Balance Sheet

At the end of September IDEX had \$5.7 million in cash, \$4.7 million in working capital and no debt. It is burning about \$1.5-\$2 million a month. On November 9th the company sold 42.5 million new shares at NOK 1.65 per share in a private placement resulting in gross proceeds of NOK 70 million (US\$7.9 million). It now has 832 million shares outstanding. It has filed an F-1 with the SEC to list American Depository Shares (ADSs) on NASDAQ under the ticker IDBA, at the ratio of 75:1 shares to ADS.

FORECASTS

Q4 2020

For Q4 2020, we are expecting revenues to be higher than Q3 as the company ships more of the product from orders received in October combined with Bloomberg and other previous orders.

Expenses should be similar to Q3 with the exception of expense incurred from the F-1 filing, NASDAQ expenses, and any variable incentive compensation earned and recorded. Given the November raise the average share count should increase to 810 million up 32% from last year. This would lead to a loss per share of \$0.01 compared to a loss of \$0.02 a year ago.

2020

For the year we are expecting revenues of \$1.1 million to be reported compared to \$430,000 last year. This would lead to a loss of \$26.3 million compared to a loss of \$32.3 million in 2019. This is a loss per share of \$0.04 per share flat with last year's results on an increase of shares of 25%.

2021

In 2021 we expected some increase in revenues that will come from increased shipments to Bloomberg and the beginnings of volume shipments in the payment card market. We suggest investors focus more on design wins, pilots, customers signed, and card certifications. A pilot can take a couple of months and then a design win can turn into revenues six to twelve months later. To get an idea of order of magnitude, a customer order for samples could be \$30,000, while for a pilot could be \$50,000 to \$100,000 for 100 to 200 cards. For a typical launch, volume could be 2 million units or \$6 million in shipments.

Another important factor for 2021 and 2022 is the cash burn required to reach cash breakeven, which will dilute shareholders. For 2021 we are expecting revenues of between \$3 and \$7 million depending on when customers decide to place orders after successful pilots. Most revenues will be in the latter half of the year, although we do expect revenues to increase sequentially throughout 2021.

Expenses are more predictable, and we expect the company to spend in levels more like 2019 than 2020. Expenses of \$30 million in 2021 would lead to a loss of \$29 million for the year requiring \$26 million in cash.

For 2021 we are looking for revenues of \$5 million and a loss of \$29 million or a loss of \$0.04 per share using 874 million shares.

Beyond 2021

In order to evaluate IDEX's potential revenues we need to look at the market and think about the possible market share IDEX could capture. Using ABI's forecast of 353 million biometric cards in 2025 as the minimum and IDEX's content of \$3 per card that is a total addressable market of \$1.1 billion a year. If IDEX gets half, that is \$530 million in revenues in 2025.

However given the actual cost of the card at \$5 per card, we believe the potential market is closer to that afforded by the entire contactless card market size, which would be 3.4 billion cards or \$10.2 billion. Assuming half the contactless market goes biometric and half of the half goes to IDEX that would be \$2.6 billion in revenues to IDEX in 2025.

The company should be EBITDA positive at quarterly revenues of \$11-13 million and \$6-7 million in expenses using a 50% gross margin. We expect this could be achieved in 2022.

VALUATION

IDEX is coming from near zero revenues as it launches its new products and gains acceptance in the marketplace. To value the company we need to look to future years and discount valuations back to today to calculate a current price for IDEX. From the comp chart below we see that the average fabless semiconductor company trades as an average of 10.1 times enterprise value to 2021 estimated sales. By 2025 IDEX could reach \$500 million in sales or higher. That would result in an enterprise value of \$5 billion. Given the company will need to raise cash to get to breakeven, we are adding 127 million shares to reach 957 million by 2025. Divided by 957 gives us a stock price of \$5.22 share. Discounting that by 30% per year to current value gives an EV of \$1.75 billion and a stock price of \$1.83 per share. To be conservative we are starting with a valuation of \$1.00 per share and will increase that as we see it ramp revenues and land design wins on its path to our earnings expectations.

Fabless Semiconductors

Company	Ticker	Cal. Revenue			EBITDA	EBITDA Margin	Enterprise Value / Sales			EV/EBITDA	Included in Average?	Ent. Value
		2021E	2020E	LTM			2021E	2020E	LTM			
AMD	AMD	\$13,340	\$9,760	\$9,760	1,660	17%	7.9x	10.8x	10.8x	63.3x	y	105,000
Broadcom	AVGO	\$26,500	\$24,600	\$23,890	11,040	46%	8.2x	8.8x	9.1x	19.7x	y	217,199
Cirrus Logic	CRUS	\$1,412	\$1,330	\$1,240	242	20%	3.8x	4.0x	4.3x	21.9x	y	5,306
Inphi	IPHI	\$803	\$683	\$598	98	16%	11.4x	13.5x	15.4x	94.0x	y	9,185
Lightwave Logic	LWLG	NA	NA	\$0	(6)	NM	NM	NM	NM	-29.1x	y	168
Marvell	MRVL	\$3,480	\$2,980	\$2,890	496	17%	10.3x	12.0x	12.4x	72.0x	y	35,700
MediaTek	2454.TW	NA	NA	\$290,450	42,810	15%	NA	NA	4.4x	30.1x	y	1,288,300
Monolithic Power Sys	MPWR	\$946	\$837	\$778	175	22%	17.0x	19.2x	20.6x	91.8x	y	16,045
Novatek	3034.TW	NA	NA	\$74,030	13,340	18%	NA	NA	3.0x	16.8x	y	223,684
NVIDIA	NVDA	\$18,730	\$16,490	\$14,780	5,120	35%	17.1x	19.5x	21.7x	62.7x	y	321,000
Qualcomm	QCOM	\$30,700	\$24,800	\$23,530	7,620.0	32%	5.9x	7.3x	7.7x	23.8x	y	181,180
Realtek	2379.TW	NA	NA	\$72,360	8,940.0	12%	NA	NA	2.7x	22.2x	y	198,880
Xilinx	XLNX	\$3,375	\$3,050	\$3,050	952.0	31%	9.4x	10.4x	10.4x	33.4x	y	31,810
Average							10.1x	11.7x	10.2x	40.2x		202,574

RISKS

- The use of biometric payment and security cards is still in the testing and pilot stage. There is no assurance customers will ultimately choose to use this technology or that it will work as expected.
- IDEX is just starting to produce larger volumes of product. There is no assurance they will be able to successfully manufacture product in the volumes needed at the cost expected.
- Production ramps and customer acceptance and rollouts may take longer than expected and forecasts may not be achieved in the time frame we predict.
- The company is still losing money and is cash flow negative. We expect it will need further funding before reaching cash flow break even, diluting current shareholders.

MANAGEMENT

VINCENT (VINCE) GRAZIANI

Chief Executive Officer

Mr. Graziani became Chief Executive Officer (CEO) of IDEX on 27 February 2020. He joined IDEX from Infineon Technologies where he was most recently VP of Strategy Development and Implementation and was responsible for leading new business development and strategic partnerships. Vince has also led technology companies from the pre-revenue stage to significant revenues and scale while serving as CEO of Sand 9 Inc., Vbrick Systems, and Sandburst Inc. Earlier in his career, he held positions of increasing responsibility in engineering as well as sales and marketing at Intel, Broadcom, and Siemens Semiconductor. Mr. Graziani works at IDEX America in Wilmington, Massachusetts.

As of November 10, 2020, Mr. Graziani held 1,035,000 shares and 5,000,000 subscription rights to shares in IDEX.

DEREK D'ANTILIO

Chief Financial Officer

Mr. D'Antilio joined IDEX as CFO in July 2019. He has over twenty years of financial experience with some of the most recognizable companies, including PwC and Hewlett Packard. He has held senior finance positions at high-growth US-listed technology companies with responsibility for global accounting and reporting, financial planning, treasury, tax, operations, and investor relations. Prior to joining IDEX, Mr. D'Antilio served for eight years as VP of Finance and Corporate Controller of MKS Instruments, Inc. Mr. D'Antilio has an MBA from Babson College with Honors and is a Certified Public Accountant and Certified Management Accountant. Mr. D'Antilio works at IDEX America in Wilmington, Massachusetts.

As of November 10, 2020, Mr. D'Antilio held 611,479 shares and 2,000,000 subscription rights to shares in IDEX.

ANTHONY EATON

Chief Technology Officer

Mr. Eaton joined IDEX Biometrics in August 2016 and became CTO in March 2019 having previously served as the company's VP of Systems Engineering. Before IDEX, he served as Director of System Engineering at Atmel, where he was responsible for building and running the System Engineering function for the MaxTouch Business Unit. Prior to this Mr. Eaton held senior engineering roles at NVIDIA, Mirics Semiconductor and Sony Semiconductor. Mr. Eaton holds a First Class Bachelors and Master's degree in Engineering from Cambridge University, England. Mr. Eaton works at IDEX UK in Farnborough, UK.

As of November 10, 2020, Mr. Eaton held 211,041 shares and 1,452,800 subscription rights to shares in IDEX.

STANLEY A. (STAN) SWEARINGEN

SVP, Strategy & Advanced Technology

Mr. Swearingen took up his current position in February of 2020. He first joined IDEX's Strategy Advisory Council in May 2016 and was appointed Chief Products Officer of the company in October 2016. He was promoted to CEO in April 2018. Prior to joining IDEX, Mr. Swearingen served as SVP & General Manager MaxTouch Business Unit and CTO of Atmel. Mr. Swearingen has also served as SVP and General Manager Biometric Products Division and CTO for Synaptics, where he was instrumental in the formulation of the biometric fingerprint strategy, including the acquisition of Validity. Prior to Synaptics, Mr. Swearingen held senior positions at semiconductor companies, such as MiniCircuits, Skyworks Solutions, Agere Systems, and National Semiconductor. Mr. Swearingen has his office at IDEX America in Wilmington, Massachusetts.

As of April 21, 2020, Mr. Swearingen held 400,000 shares and 8,015,900 subscription rights to shares in IDEX.

FRED BENKLEY
Chief Innovation Officer

Fred previously served as CTO at IDEX Biometrics. He has over 30 years of experience in the semiconductor technology and biometrics industries. Fred founded Picofield Technologies in 2010, which company's technology was acquired by IDEX in 2013. He founded Validity Sensors in 2002 and Metro Engineering prior. Fred holds a B.S. in Electrical Engineering from Northeastern University.

BOARD OF DIRECTORS

MORTEN OPSTAD
Chairman

Mr. Opstad has served as chair of the board in IDEX since 1997. Mr. Opstad is a partner in Advokatfirma Ræder DA in Oslo. He has rendered legal assistance with respect to establishing and organizing several technology and innovation companies. He currently serves as chairman of the board of Thin Film Electronics ASA. Mr. Opstad earned a legal degree (Cand.Jur.) from the University of Oslo in 1979. He was admitted to the Norwegian Bar Association in 1986. Mr. Opstad was born in 1953 and is a Norwegian citizen and resides in Oslo.

As of November 10, 2020, Mr. Opstad and close relations held or controlled 7,398,916 shares in IDEX.

LAWRENCE JOHN (LARRY) CIACCIA
Deputy chair

Mr. Ciaccia has served the board of IDEX since 2015 and deputy chairman of the board since 2019. He has broad expertise from the semiconductor industry. Mr. Ciaccia played a pivotal role in transforming AuthenTec from a start-up, into the world's leading fingerprint sensor supplier, and served as its CEO from September 2010 and was instrumental in the acquisition of AuthenTec by Apple in October 2012. He remained with Apple through 2013 to assist in the acquisition integration and transition. Mr. Ciaccia is a US citizen, and resides in Florida.

As of November 10 2020, Mr. Ciaccia held 271,563 shares and 600,000 subscription rights to shares in IDEX.

DEBORAH DAVIS

Ms. Davis has served the board of IDEX since 2015. She holds non-executive director positions at Which?, The Institute of Directors UK and International Personal Finance plc. and is a trustee of Southern African Conservation Trust. Prior to this, she held senior executive leadership roles at PayPal, eBay, Verizon, and Symantec. Ms. Davis holds a Diploma in Company Direction with distinction from IoD, a Sloan Masters in Science (Management) with Distinction from London Business School and a Bachelor of Applied Science (Electronics) Honors degree from the University of Melbourne. Ms. Davis is a dual citizen of the UK and Australia and splits her time across UK, Africa, and the Far East.

As of November 10, 2020, Ms. Davis held 564,479 shares in IDEX.

HANNE HØVDING

Ms. Høvdning has served on the board of IDEX since 2007. Ms. Høvdning has a Bachelor's Degree in Economics and Business Administration from the Norwegian School of Economics and Business Administration. In her professional career Ms. Høvdning has held several management positions within personnel administration, finance, credit card administration and debt collection. Ms. Høvdning is a Norwegian citizen and resides in Oslo.

As of November 10, 2020, Ms. Høvdning held 487,778 shares in IDEX.

STEPHEN A. (STEVE) SKAGGS

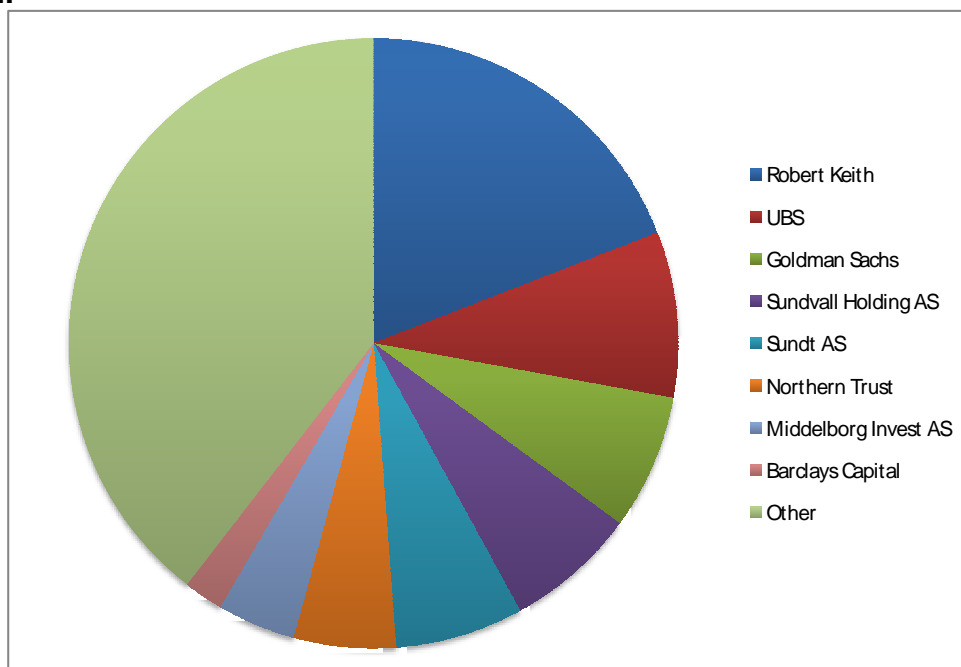
Mr. Skaggs has served on the Board of IDEX since May 2019. He currently also serves as a non-executive director of Coherent, Inc. Mr. Skaggs has more than 25 years of experience in the semiconductor industry, including serving as President, CEO, and CFO of Lattice Semiconductor. Mr. Skaggs served as SVP and CFO of Atmel Corporation, prior to its acquisition by Microchip Technology Incorporated. Early in his career, he worked for Bain & Company. Mr. Skaggs holds an MBA degree from the Harvard Business School and a B.S. degree in Chemical Engineering from the University of California, Berkeley. Mr. Skaggs is a United States citizen and lives in Oregon.

As of November 10, 2020, Mr. Skaggs held 764,909 shares in IDEX.

TOM QUINDLEN

Tom is expected to join the board after a shareholder vote of approval. He is Executive Vice President and CEO for Retail Card at Synchrony, a premier consumer financial services company. Retail Card is the largest division of Synchrony; it has more than 75m active accounts and more than \$149 billion in sales financed. Tom has spent 30 years there, including five years in Europe and Asia, even before it was spun off from GE. Before working at GE Capital, Tom spent seven years at GE Aerospace in finance and auditing. He earned a BA in Accounting from Villanova in 1984 where he is on the board of trustees. He is a US citizen and lives in Connecticut.

OWNERSHIP



PATENTS

The company has 55 patent families, 113 granted patents and 101 pending. None of these patents have been defended in court. It believes the following are the most important barriers to competition:

Remote Enrollment Patent Family

The company is licensing its enrollment sleeve technology to card makers. It has already licensed Idemia and Chutien and is in talks with others. The main patents that underpin this technology include:

US Patent No.: 10,282,651

Sensor array system selectively configurable as a fingerprint sensor or data entry device

Abstract

Devices, systems, and methods facilitate enrollment of authenticating biometric data for authenticating an authorized user via a biometric sensor. Included devices transmit power to a sensor-enabled device that does not have an independent power source without transmitting data to or from the device. Data input devices coupled to the biometric sensor enables user input of non-biometric data, such as an activation code, via the biometric sensor. For biometric sensors comprising fingerprint sensors, finger guides position a finger to contact the sensor at a desired orientation. Systems and methods allow for enrollment of one or more authenticating biometric data templates with or without requiring input of non-biometric authentication data, such as an activation code.

US Patent No.: 10,248,900

Sensor array system selectively configurable as a fingerprint sensor or data entry device

Abstract

Devices, systems, and methods facilitate enrollment of authenticating biometric data for authenticating an authorized user via a biometric sensor. Included devices transmit power to a sensor-enabled device that does not have an independent power source without transmitting data to or from the device. Data input devices coupled to the biometric sensor enables user input of non-biometric data, such as an activation code, via the biometric sensor. For biometric sensors comprising fingerprint sensors, finger guides position a finger to contact the sensor at a desired orientation. Systems and methods allow for enrollment of one or more authenticating biometric data templates with or without requiring input of non-biometric authentication data, such as an activation code.

US Patent No.: 10,546,223

Sensor array system selectively configurable as a fingerprint sensor or data entry device

Abstract

Devices, systems, and methods facilitate enrollment of authenticating biometric data for authenticating an authorized user via a biometric sensor. Included devices transmit power to a sensor-enabled device that does not have an independent power source without transmitting data to or from the device. Data input devices coupled to the biometric sensor enables user input of non-biometric data, such as an activation code, via the biometric sensor. For biometric sensors comprising fingerprint sensors, finger guides position a finger to contact the sensor at a desired orientation. Systems and methods allow for enrollment of one or more authenticating biometric data templates with or without requiring input of non-biometric authentication data, such as an activation code.

US Patent No. 10,769,512

Device and method to facilitate enrollment of a biometric template

Abstract

Devices, systems, and methods facilitate enrollment of authenticating biometric data for authenticating an authorized user via a biometric sensor. Included devices transmit power to a sensor-enabled device that does not have an independent power source without transmitting data to or from the device. Data input devices coupled to the biometric sensor enables user input of non-biometric data, such as an activation code, via the biometric sensor. For biometric sensors comprising fingerprint sensors, finger guides position a

finger to contact the sensor at a desired orientation. Systems and methods allow for enrollment of one or more authenticating biometric data templates with or without requiring input of non-biometric authentication data, such as an activation code.

US Patent No.: 10,775,906

Power source for biometric enrollment with status indicators

Abstract

Devices, systems, and methods facilitate enrollment of authenticating biometric data for authenticating an authorized user via a biometric sensor. In one aspect, power is transmitted to a smart card from a power source removably coupled to the smart card, the power source including a power element that provides power to the fingerprint sensor and a finger guide comprising two or more finger guide channels positioned adjacent to the fingerprint sensor of the smart card when the power source is coupled to the smart card. Each finger guide channel is configured to position a finger placed thereon to contact the fingerprint sensor at a different orientation. During the transmission of power to the smart card, the user is instructed with respect to the placement and removal of the user's finger with respect to each finger guide channel with a status indicator associated with the finger guide channel.

There are also granted patents in the enrollment family in: Australia, China, Germany, England, and Spain. There are 11 pending applications in: the US, Australia, China, Germany, Europe, Hong Kong, and Mexico.

Matcher Patent Family

Once the user's fingerprint is enrolled, subsequent uses of the card will require fingerprints scanned by the sensor to be matched to the template created during enrollment to verify that the person attempting to use the card is authorized to do so. Exemplary patents in this family are:

US Patent No.: 9,940,502
US Patent No.: 10,528,789
US Patent No.: 9,684,813
US Patent No.: 9,928,401
US Patent No.: 7,512,256
US Patent No.: 10,157,306
US Patent No.: 10,600,219
US Patent No.: 10,621,765

US Patent No.: 10,331,936
US Patent No.: 9,805,247
US Patent No.: 10,325,141
US Patent No.: 10,395,129
US Patent No.: 10,551,931
US Patent No.: 10,534,952
US Patent No.: 10,133,912
China Patent No.: 106,326,833

Sensor Patent Family

IDEX sensors use an "off-chip" design, which separates the fingerprint sensor into two key components: the sensor array and the silicon chip. This off-chip design architecture allows the sensor array to be made from a flexible and cost-efficient polymer substrate while minimizing the silicon area needed for the silicon chip. Primary patents related to this technology are:

US Patent No.: 8,421,890
US Patent No.: 9,659,208
US Patent No.: 10,115,001
US Patent No.: 10,592,719
US Patent No.: 10,088,939
US Patent No.: 10,114,497

US Patent No.: 9,798,917
US Patent No.: 10,101,851
Korean Patent No.: 10-1769640
China Patent No.: CN102893248
China Patent No.: CN102906761
China Patent No.: CN104838390

INCOME STATEMENT

US\$ in Thousands												
	Q1 19	Q2 19	Q3 19	Q4 19	Q1 20	Q2 20	Q3 20	Q4 20E	2019	2020E	2021E	2022E
Product sales	10	42	53	54	53	121	246	600	159	1,020		
Other operating income	150	1	96	18	47	28	2	20	265	97		
Total Revenue	\$ 160	\$ 43	\$ 149	\$ 71	\$ 100	\$ 149	\$ 248	\$ 620	\$ 423	\$ 1,117	\$ 5,000	\$ 20,000
Yr-to-yr growth	74.3%				-37.5%	246.5%	66.4%	773.2%		164.1%	347.6%	300.0%
Cost of revenue	6	19	21	16	19	32	45	120	62	216	2,500	10,000
Gross margin	154	24	128	55	81	117	203	500	361	901	2,500	10,000
Gross margin %	96.3%	55.8%	85.9%	77.5%	81.0%	78.5%	81.9%	80.6%	85.3%	80.7%	50.0%	50.0%
Operating expenses												
Payroll expenses	5,259	4,780	5,037	6,673	4,677	3,515	4,275	4,300	21,749	16,767	20,600	18,000
Development expenses	1,141	919	968	1,357	40	1,069	930	1,000	4,385	3,039	4,400	4,000
Other operating expenses	1,132	1,254	1,012	1,243	1,191	1,218	1,370	1,400	4,641	5,179	5,000	4,800
Operating expenses	7,532	6,953	7,017	9,273	5,908	5,802	6,575	6,700	30,775	24,985	30,000	30,000
Operating income	(7,378)	(6,929)	(6,889)	(9,218)	(5,827)	(5,685)	(6,372)	(6,200)	(30,414)	(24,084)	(27,500)	(20,000)
Amortization and depreciation	401	406	393	3,929	429	422	430	430	1,633	1,711	1,720	1,720
Net financial items	(17)	(52)	(110)	(326)	(164)	(330)	7	0	(216)	(487)	0	0
Pretax loss from operations	(7,796)	(7,387)	(7,392)	(13,473)	(6,420)	(6,437)	(6,795)	(6,630)	(32,263)	(26,282)	(29,220)	(21,720)
Income taxes	94	155	129	(218)	(101)	(41)	(3)	0	160	(145)	0	0
Net loss	(7,890)	(7,542)	(7,521)	(13,255)	(6,319)	(6,396)	(6,792)	(6,630)	(32,423)	(26,427)	(29,220)	(21,720)
Non-GAAP net loss	(7,101)	(6,932)	(6,926)	(12,718)	(5,806)	(5,992)	(5,128)	(6,230)	(29,892)	(26,427)	(29,220)	(21,720)
Exchange differences on foreign operations	(17)	(305)	117	239	717	(305)	(622)	0	34	(210)	0	0
Total comprehensive income	(7,907)	(7,847)	(7,404)	(13,016)	(5,602)	(6,701)	(7,414)	(6,630)	(32,389)	(26,637)	(29,220)	(21,720)
Basic net loss per share	\$ (0.014)	\$ (0.013)	\$ (0.013)	\$ (0.022)	\$ (0.009)	\$ (0.009)	\$ (0.009)	\$ (0.008)	\$ (0.053)	\$ (0.035)	\$ (0.033)	\$ (0.023)
Yr-to-yr growth					-36.4%	-31.7%	-31.5%	-62.1%		-34.6%	-3.2%	-30.7%
Non-GAAP loss per share	\$ (0.012)	\$ (0.012)	\$ (0.012)	\$ (0.021)	\$ (0.008)	\$ (0.008)	\$ (0.006)	\$ (0.008)	\$ (0.049)	\$ (0.035)	\$ (0.033)	\$ (0.023)
Basic shares outstanding in mil	570.4	597.8	598.0	613.3	718.0	742.6	787.9	810.0	613.3	764.6	873.6	936.6
Yr-to-yr growth					25.9%	24.2%	31.8%	32.1%		24.7%	14.3%	7.2%
Diluted shares	570.4	597.8	598.0	605.4	719.1	743.7	789.0	811.1	605.4	765.7	874.7	937.7
Yr-to-yr growth					26.1%	24.4%	31.9%	34.0%		26.5%	14.2%	7.2%
Basic net loss per ADS	-\$1.04	-\$0.95	-\$0.94	-\$1.62	-\$0.66	-\$0.65	-\$0.65	-\$0.41	-\$3.96	-\$2.29	-\$2.64	-\$1.96
Non-GAAP loss per ADS	-\$0.93	-\$0.87	-\$0.87	-\$1.58	-\$0.56	-\$0.56	-\$0.46	-\$0.36	-\$3.70	-\$2.13	-\$2.47	-\$1.84
Basic ADS outstanding in millions	7.6	8.0	8.0	8.2	9.6	9.9	10.5	16.2	8.2	11.5	11.1	11.1
Diluted ADS	7.6	8.0	8.0	8.1	10.3	10.6	11.2	17.3	8.1	12.4	11.8	11.8
EBITDA	(6,589)	(6,319)	(6,294)	(8,681)	(5,314)	(5,281)	(5,308)	(5,800)	(27,883)	(21,703)	(22,500)	(15,000)

BALANCE SHEET

Thousands US \$	Sept 30, 2020	June 30, 2020	Qtr-Qtr % Growth	Sept 30, 2019	Yr-Yr % Growth
Current					
Cash and cash equivalents	\$ 5,704	\$ 11,401	-50%	\$ 10,667	-47%
Inventory	834	676	0%	1,609	-48%
Trade receivables	223	150	49%	8	2688%
Prepaid expenses	655	688	-5%	535	22%
Other current receivables	686	928	-26%	785	-13%
Current Assets	8,102	13,843	-41%	13,604	-40%
Goodwill	871	848	3%	909	-4%
Other intangible assets	2,123	2,160	-2%	2,645	-20%
Property, plant and equipment	1,661	1,710	-3%	1,802	-8%
Right of use asset	1,017	1,022	0%	764	33%
Long-term receivable	72	124	-42%	139	-48%
Total Assets	13,846	19,707	-30%	19,863	-30%
Liabilities					
Accounts payable	539	975	-45%	660	-18%
Income tax payable	97	97	NM	349	-72%
Current lease liabilities	661	698	-5%	674	-2%
Public duties payable	209	549	-62%	157	33%
Notional employer's tax on sub. Rights	54	20	170%	0	NM
Other current liabilities	1,813	1,813	0%	1,471	23%
Current Liabilities	3,373	4,152	-19%	3,311	2%
Deferred tax liability	0	0	NM	25	-100%
Non-current lease liability	392	352	11%	108	263%
Total liabilities	3,765	4,504	-16%	3,444	9%
Shareholders' Equity					
Share capital	16,505	16,376	1%	13,445	23%
Share premium	206,624	206,636	0%	189,731	9%
Other paid-in capital	17,844	16,160	10%	15,388	16%
Total paid-in capital	240,973	239,172	1%	218,564	10%
Foreign currency translation effects	(13,201)	NA	NA	(13,433)	-2%
Retained earnings	(217,690)	(223,968)	-3%	(188,709)	15%
Total shareholder's equity	10,082	15,204	-34%	16,422	-39%
Tot Liabilities and Share. Equity	13,847	19,708	-30%	19,866	-30%
Cash	\$ 5,704	\$ 11,401	-50%	\$ 10,667	-47%
Current ratio	2.4	3.3	-28%	4.1	-42%
Quick ratio	2.2	3.2	-32%	3.6	-41%
Working capital	4,729	9,691	-51%	10,293	-54%
Debt	0	0	0%	0	0%
Debt/total assets	0.0%	0.0%	0%	0.0%	0%

CASH FLOWS

	Mar. 31, 2019	June 30, 2019	Sept 30, 2019	Dec. 31, 2019	YR 2019	Mar. 31, 2020	June 30, 2020	Sept 30, 2020
	3 month	3 month	3 month	3 month		3 month	3 month	3 month
Cash flows from operating activities:								
Net loss	\$ (7,795)	\$ (7,387)	\$ (7,392)	\$ (9,689)	\$ (32,263)	\$ (6,420)	\$ (6,436)	\$ (6,795)
Adjustments to reconcile net loss to net cash used in operating activities:								
Amortization and depreciation	402	406	396	429	1,633	429	422	430
Stock-based compensation	789	610	595	537	2,531	513	404	1,064
Changes in working capital:								
Inventories	(190)	(312)	(304)	1,276	470	(16)	(42)	(140)
Accounts receivables	(90)	159	155	(216)	8	(59)	(63)	(72)
Accounts payable	(84)	237	231	(508)	(124)	217	329	(447)
Change in other working capital	(1,053)	(371)	(623)	2,442	395	12	(695)	(69)
Other operating activities	(6)	4	4	11	13	197	325	(51)
Net financial items	(33)	(51)	(50)	(1)	(135)	(20)	-	(2)
Income taxes	3	(195)	(190)	156	(226)	(16)	43	-
Net cash flows from operating activities	(8,057)	(6,900)	(7,178)	(5,563)	(27,698)	(5,163)	(5,713)	(6,082)
Cash flows from investing activities:								
Purchases of property, plant & equipment	(31)	(261)	(233)	(325)	(850)	(522)	(18)	(51)
Proceeds from sale of assets	-	-	-	30	30	-	-	-
Payments on non-current receivables	2	-	-	(8)	(6)	-	19	56
Interest received	33	51	30	21	135	19	-	1
Net cash flows from investing activities	4	(209)	(203)	(282)	(691)	(503)	1	6
Cash flows from financing activities:								
Proceeds from issue of shares	24,514	(506)	-	9,619	33,627	(1)	10,251	-
Payments on lease liabilities	(164)	(165)	(164)	(182)	(675)	(192)	(200)	(199)
Net cash provided by financing activities	24,350	(671)	(164)	9,437	32,952	(193)	10,051	(199)
Net increase (decrease) in cash	16,297	(7,780)	(7,545)	3,592	4,563	5,861	4,339	(6,275)
Effect of exchange rate changes on cash	(3)	(29)	7	(47)	(72)	(1,265)	62	577
Cash at beginning of period	9,722	26,016	18,207	10,669	9,635	14,126	7,001	11,402
Cash at end of period	26,016	18,207	10,669	14,214	14,126	18,722	11,402	5,704
Cash flow	(6,604)	(6,371)	(6,401)	(8,723)	(28,099)	(5,478)	(5,610)	(5,301)
Free cash flow	(6,635)	(6,632)	(6,634)	(9,018)	(28,919)	(6,000)	(5,628)	(5,352)

HISTORICAL STOCK PRICE



DISCLOSURES

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