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# 3D Printing – the next industrial *revolution*? Solactive 3D Printing Total Return Index.

Open End Index Certificate on the Solactive 3D Printing Total Return Index

# I. 3D printing – the next industrial revolution?

"A once-shuttered warehouse is now a state-of-the art lab where new workers are mastering the 3D printing that has the potential to revolutionize the way we make almost everything," said not just anybody, but someone with authority: Barack Obama. The President of the United States hopes that the 3D printing technology will create new high-tech jobs in the U.S., as stated in a public speech in February 2013. In the process of 3D printing, digital models are used to generate objects in the real world, layer by layer. Soon, thanks to the 3D printing technology, each consumer should ideally be able to simply print nearly every object in the required size and in the correct proportion, when and where needed. That could completely change our current enterprise resource planning system, because in the future only data of goods could be sent around instead of the goods themselves.

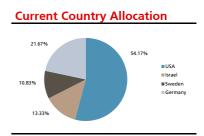
Originally the three-dimensional printing was developed and used to manufacture prototypes and preliminary models. In recent years, the 3D printing technology has developed rapidly. Remarkable examples show what nowadays can already be printed: Among other things all parts of a perfect-fitting pair of shoes, ticking clocks, functional batteries and roadworthy cars were designed on the PC and materialized by 3D printing. Powerful 3D scanners also allow reproducing form-rich objects. This raises hopes that in the future even human organs can be reproduced – even today prostheses and implants already are regular objects generated by 3D printing.

## II. Benefits of 3D printing technology

The hopes for the relatively new 3D printing technology are high. The advantages over conventional methods are obvious: In addition to individual, tailor-made design options, 3D printing objects can be produced ad-hoc and on demand. Therefore, it cannot be ruled out that the 3D printing could revolutionize the established industry model. Now-adays high-end devices are already able to scan objects and reproduce small product series. Should the 3D printing actually unfold its full potential, an immense growth perspective becomes available for the still small industry which could also lift the pioneers of the relatively young business segment. Moreover, the 3D devices are becoming more affordable for private users. This could result in 3D technology being more attractive for home supplies, and thus for the mass market.

# III. Common 3D printing techniques

The current 3D printing processes mainly differ from the materials used for the 3D print. The outcomes are generally constructed during physical and chemical melting and curing processes. Metals for example, in powder form, can be jointly cemented layer by UBS Open End Index Certificate WKN / ISIN UBS13D / DE000UBS13D0



Data as of 13.05.2014 Source: Solactive AG (formerly Structured Solutions AG)

# **Investor Profile**

A solution for investors with semi to increased risk tolerance, who would like to profit with relatively little capital expenditure and administration effort from the performance of all shares included in the index. layer during selective laser melting and electron beam melting. In a similar vein, a 3D printer can build objects not only out of metal, but also out of polymers and ceramics. Stereolithography can form structures by spreading and curing liquid resins in layers. The Fused Deposition Modeling (FDM) works similarly, as it liquefies plastic and partially synthetic resins by heat in order to place it in layers as requested.

# **IV. Product solution**

The Open End Index Certificate on the Solactive 3D Printing Total Return Index tracks the performance of the underlying Index, which reinvests net dividends of the index members. A management fee of 0.75% p.a. applies.

# V. Transparent index concept

The Solactive 3D Printing Total Return Index targets the pioneers of the 3D printing industry, according to the index provider Solactive AG (formerly Structured Solutions AG). Therefore, only companies that meet numerous quality criteria will be in the selection pool for the index. To become an index member the company should already generate a significant portion of its turnover in the 3D printing area, or at least should be about to build up the 3D printing area that has the potential to take a significant share of the company's revenues.

The index concept also takes the dynamic environment of the relatively new 3D printing segment into account, as no one currently knows in which direction the 3D printing will develop and which company will finally assert itself. Therefore, the index concept allows, in addition to the regular index adjustments twice a year, a "fast entry" rule: This enables the index to include new shares, at any time, for example immediately after an IPO, if the corresponding company meets the quality criteria. This implies that the shares of each company must be listed on a stock exchange that grant foreign investors access to trade without restrictions. In addition, due to liquidity reasons, the market capitalization of the company has to be at least 50 million U.S. dollars, and the average daily trading volume over the past three months has to be at least 250,000 U.S. dollars. On index adjustments all index members are weighted equally, although companies with a market capitalization of less than 250 million U.S. dollars are assigned a maximum index weight of 2.5 percent. This rule has been applied on 18.11.2013 for the first time.

# VI. Members of the Solactive 3D Printing Index

As per extraordinary index rebalancing on 13 May 2014 ten companies fulfilled the above mentioned quality criteria. These companies are briefly described below:

			Current
Company	Country	Market Cap	Weighting
3D Systems Corporation	USA	5.03 billion USD	10.833%
Arcam AB	Sweden	2.71 billion SEK	10.833%
Autodesk, Inc.	USA	11.06 billion USD	10.833%
ExOne Company	USA	450.50 million USD	10.833%
Organovo Holdings Inc.	USA	498.03 million USD	10.833%
Proto Labs, Inc.	USA	1.68 billion USD	10.833%
SLM Solution Group AG	Germany	333.03 million EUR	10.833%
Stratasys, Ltd.	Israel	4.41 billion USD	10.833%
Voxeljet AG	Germany	251.10 million USD	10.833%
Cimatron Group	Israel	72.75 million USD	2.50%

Data as of 13.05.2014, Source: Solactive AG (formerly Structured Solutions AG), Bloomberg

## **3D Systems Corporation**

3D Systems is fully dedicated to 3D printing. The U.S. company provides not only 3D hardware including printers and printing materials, but also the associated 3D printing software. In addition, 3D Systems produces 3D printing parts on request. 3D Systems understands itself not only as a partner of large scale industries to develop prototypes, but also offers products and services to private users. 3D Systems reported 2013 a turnover of 513.4 million U.S. dollars and a profit of 44.12 million U.S. dollars (as of 13.05.2014).

## Arcam AB

Arcam was founded in 1997 and is listed on NASDAQ OMX Stockholm, Sweden. Head office and production facilities are located in Mölndal, Sweden. Since the start Arcam's vision has remained the same: to revolutionize the art of manufacturing complex parts. The company provides additive manufacturing solution for production of metal components, including auxiliary equipment, software, metal powders, service and training. Arcam's market scope is global with customers mainly in the orthopedic implant and aerospace industries. Arcam generated in 2012 a turnover of 139.1 million U.S. dollars and a profit of 15 million U.S. dollars (as of 13.05.2014).

# Autodesk, Inc.

Autodesk is well-known among designers. The software for object visualisation is used by architects, film-makers and within the automobile industry. The company based in San Rafael, California, is also known as a 3D software specialist, who currently also offers mobile applications for iPad, iPhone & Co. The most famous programme developed by Autodesk might be AutoCAD, offered since 1982. In the fiscal year 2013 Autodesk generated a turnover of 2.27 billion U.S. dollars and a profit of 228.8 million U.S. dollars (as of 13.05.2014).

# **ExOne Company**

The ExOne Company (ExOne) was founded in 2005 as a spin-off of Extrude Hone Corporation, a global supplier and developer of precision non-traditional machining processes and automated systems for more than 40 years. 3D printing and laser micromachining became the core technologies for ExOne, which currently supplies services, systems and solutions for manufacturing in the digital age, including three-dimensional printing in sand, metal and glass as well as laser micromachining. Quite recently since 7 February 2013 the shares of the company trade on the NASDAQ stock exchange. ExOne generated in 2012 a turnover of 39.48 million U.S. dollars and a loss of 6.32 million U.S. dollars (as of 13.05.2014).

# **Organovo Holdings Inc.**

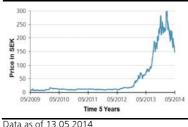
Organovo was founded in April 2007 in Delaware, had its IPO in February 2012 and moved to San Diego in July 2012. Organovo is specialized in 3D printing of organs. For this purpose the Californians use a bio-ink which is brought into the desired shape by a special inkjet printer. The 3D bio-printer which was co-developed by Organovo 3D has been honored by the U.S. magazine Time as one of the best inventions in 2010. The most recent headline event was taking place in late October 2013, when Organovo presented at a conference a mini-liver which was 3D-printed out of human somatic cells and worked in a laboratory environment for approximately 40 days. That feeds the hopes to reprint a fully functioning liver which can be implanted patients without causing the risk of rejection due to the structure of the body's own cells. In 2013, Organovo had revenues of 0.21 million U.S. dollars and made a loss of 16.12 million U.S. dollars (as of 13.05.2014).

# Historical performance\*



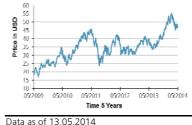
Data as of 13.05.2014 Source: Bloomberg

# Historical performance\*



Source: Bloomberg

## Historical performance\*



Source: Bloomberg

#### Historical performance\*



Source: Bloomberg

# Historical performance\*



Source: Bloomberg

## Proto Labs, Inc.

Proto Labs started in 1999 (as The Protomold Company) to specialize in the quick-turn manufacture of custom plastic injection molded parts. Today the company prides itself on being the world's fastest provider of CNC machined parts and injection molded parts. The company's services utilize proprietary computing technologies and automated manufacturing systems to provide both prototype and short-run production parts on demand. Proto Labs generated in 2013 a turnover of 163.11 million U.S. dollars and a profit of 35.28 million U.S. dollars (as of 13.05.2014).

## **SLM Solution Group AG**

SLM Solution is a company located in Lübeck, Germany, which has been focusing on selective laser melting technology in recent years. Taking into account its predecessor companies, SLM Solutions can look back on several decades of innovation and experience in Rapid prototyping plant construction.

As a manufacturer of machinery for serial- and prototype production, SLM Solutions focuses on the development, production and distribution of machinery which are used in the area of vacuum and metal casting as well as selective laser melting.

Key sectors are automotive industry, educational institutions, aerospace, and medical devices. Please note that a price history of less than one year does not allow to show a chart of the performance of the stock due to regulatory causes. (as of 13.05.2014)

# Stratasys, Ltd.

Stratasys manufactures 3D printers and printing materials. Stratasys' patented printing technologies are used by the industry to create prototypes for new design lines and finished goods in low-volume manufacturing. Regular customers are among others motorcycle, car and aircraft manufacturers, military facilities, and conventional printing manufacturers such as Hewlett Packard and Xerox. The company holds over 500 patents globally. These include the patent for "Fused Deposition Modeling" (FDM). The FDM process contains the printing of thermoplastic while liquifying through heat, applying in layers and finally cooling. Stratasys also offers an on-demand 3D printing service. Stratasys reported for 2012 a turnover of 215.2 million U.S. dollars and a profit of 8.8 million U.S. dollars (as of 13.05.2014).

## Voxeljet AG

The German company focuses on large industrial 3D-printers, which are especially useful in the automobile or aerospace industry. The strength of Voxeljet-printers lies in the realization of large objects made out of solid materials such as metals. By the end of June 2013, Voxeljet was able to deliver 52 printers. Turnover amounted to 5.8 million US-Dollars at mid-year 2013. According to the company, about 60 percent of its turnover is generated by the service sector, where 3D-objects are printed on client's behalf. Thereby, gross margin amounts to around 45 percent. Even the film industry is using this service occasionally. The James Bond movie 'Skyfall' has impressively proven what the 3D-printers of Voxeljet can accomplish: In order to display the destruction of the very rare and therefore valuable Aston Martin DB5 properly, three replicates, which were very hard to distinguish from the originals, were printed by Voxeljet printers. Located in Friedberg near Augsburg, Germany, the 3D-printing specialist went public in New York via American Depositary Shares (ADS) as of 18 October 2013. Please note that due to the track record of less than a year no price chart of the stock can be shown due to regulatory reasons (as of 13.05.2014).

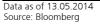
# **Cimatron Group**

Cimatron develops and distributes integrated CAD/CAM software for the manufacturing industry. The product lines cover software solutions for toolmaking, rolling mills, electrode welding machines and multifunction devices. Cimatron was founded in 1982 in Israel and thus can look back on a more than 30-year history. According to CEO Danny Haran, Cimatron is currently generating no revenues in the 3D printing area, however, want to use the existing customer base as well as the existing expertise in 3D printing to gain ground in this new business segment. Cimatron is listed on the NASDAQ and the Tel Aviv Stock Exchange. The company generated 2012 revenues of 42.3 million U.S. dollars and a profit of 3.7 million U.S. dollars (as of 13.05.2014).

\*Please note that past performance is no indication for future performance.

# Historical performance\*

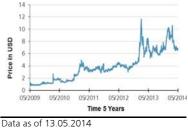












Source: Bloomberg

# **VII. Investment Opportunities**

- Full participation in companies which have a current or future business focus on the 3D printing industry.
- Fast Entry Rule allows the index calculator to include a company in the event of an IPO if the company has a high importance for the index.
- The index will be rebalanced twice a year in order to reflect changing market conditions.
- Index-based diversification through mapping of several companies which have a current or future business focus on the 3D printing industry (both hardware and software).
- Easy and flexible: UBS Open End Index Certificates in general can be bought and sold on each trading day.
- The certificate has no fixed maturity (Open End) and is therefore well suited to longer-term investment horizons.

# **VIII. Risk Assessment**

- No capital protection. The Investor bears the risk of losses if the stock prices of the included companies decline.
- The index performance substantially depends on the development of the 3D printing industry and the companies listed in the index. This means that an unfavourable development can lead to a fall in the value of the certificate.
- The issuer intends to provide (off-exchange) liquidity on every exchange trading day during normal market trading hours. Investors should, however, be aware that selling of the certificate may not be possible at all times.
- The Investor is exposed to the credit / insolvency risk of the respective issuer and can therefore lose the investment in the case of an issuer default / insolvency even if the index value rises (detailed information on the issuer is provided in the Securities Prospectus, which is available free of charge from the issuer or another notified body).
- Currency Risk: As index constituents might be nominated in another currency than the currency of the index and the certificate exchange-rate fluctuations can have a negative impact on the performance of the certificate.
- The issuer has an early redemption right under certain conditions. Further information is provided in the Securities Prospectus.

# **IX. Product Facts**

Underlying	Solactive 3D Printing Total Return Index		
WKN / ISIN	UBS13D / DE000UBS13D0		
Product Type	Open End Index Certificate		
Issuer (Rating)	UBS AG, London (A2 / A / A)		
Lead Manager	UBS Limited		
Issue Price	EUR 100.00 per Certificate		
Launch Date	20 March 2013		
Management Fee	0.75% p.a.		
Recurring Retrocession	0.25% p.a. (included in the Management Fee)		
Listing	Frankfurt (Börse Frankfurt Zertifikate), Stuttgart (EUWAX)		

# X. Information about yield disclosures

Actual costs such as fees, commissions and other charges, which are not affiliated with the issuer or the intermediary, are excluded and can negatively affect returns. For Example: Given an investment of e.g. 1,000 euro, you may assume total costs of 1.2% (Taking into account custody and administration, e.g. 0.20%, including VAT, as well as one-time transaction charges, for example, 1.0% for buying and selling the product). The gross performance of the investment amount is reduced by these costs, assumed by exemplary values, adopted at an example of imputed duration and/or holding period of the product. At 1-year maturity and/or holding period, the gross value decreased by 1.2% p.a., with 5-year maturity and/or holding period by 0.24% p.a. The actual duration and / or holding period may vary by product and / or investment horizon of the investor.

The actual, generally valid or individually negotiated charges are given by the price and service list, respective of the individual contract of/with your bank(s) and/or broker(s). They may alter the given example. Please consult with your bank/broker prior to your purchase regarding the actual costs and charges.

# **XI. Additional Information**

- Respective Termsheet
- Respective Final Terms
- Respective Base Prospectus (together with any addendums and the Final Terms: the "Securities Prospectus")

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# For UBS marketing purposes only Data as of May 2014

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