**Carbon (**[**https://www.youtube.com/watch?v=K3zhTbjKkqY&ab\_channel=itsthevoiceman**](https://www.youtube.com/watch?v=K3zhTbjKkqY&ab_channel=itsthevoiceman)**)**

**Recommendation:** They have a strong technical team and advisors, and a management team with a great track record, but there are other very similar competitors in the market. According to 3d printing engineers in forums 4 years ago they were “sucking money out of GE”, which could explain why they left. Without having a truly differentiated printing process, superior to that of others, I cannot see how this company can explode.

Maybe their management and corporate development team is tremendous and they are able to grow. I would talk to GE Ventures to see why they left and what they think about the team and how they have executed so far. Without GE’s word, I lean towards a no.

**Opportunity:** Acquire a forward contract on 58,732 shares under option from Hardik Kabaria, Software Engineer at Carbon since 2015 and Director of Software Engineering since Oct 2020. He wants to start a family and diversify (especially interested in real estate. He does not want to wait up to 2.5 years for his money.

Purchase price per share of $14.55, a 48% discount to the preferred price per share of $27.99 (per Pitchbook).

Carbon’s latest round of financing was an undisclosed secondary transaction, prior to that a $260M Series E closed in June 2019 at a $2.14B pre-money and $2.4B post-money valuation. The round was led by Baillie Gifford and Madrone Capital Partners with participation of Adidas Ventures, Arkema, Fidelity Investments, Founders Circle Capital, Johnson & Johnson Innovation - JJDC, JSR, Next Play Capital, Reform Ventures, Sequoia Capital, SharesPost and Temasek Holdings.

Previous Rounds:

| **Deal Type** | **Date** | **Amount** | **Pre-Val** | **Post-Val** |
| --- | --- | --- | --- | --- |
| Series D | February 2018 | $200M | $1.54B | $1.74B |
| Series C | September 2016 | $181M | $883.7M | $1.06B |
| Series B | August 2014 | $30M | $182.5M | $212.5M |
| Series A | March 2014 | $11M | $18M | $29M |

**Background:** Founded in 2013 in Redwood City, California. Raised $682M to date. 410 employees.

**Summary:** Carbon (previously Carbon3D) is an industrial 3D printer manufacturing intended for both prototyping and production at scale. In their team they have PhDs with technical backgrounds designing the product and on the management side, they have a team with extensive previous experience. CEO is ex-CEO of DuPont.

**Pain Point:** Traditional 3D printing is slow and error prone. This means it is good for prototyping (even though the iteration is somewhat slow) but not for production at scale. Carbon seeks to change that by using a top-down printing system that is much faster and is prepared to produce parts reliably and in quantity.

**Product**: Their 3D printers have a pool of resin at the bottom and below that, a UV projector. Each layer is projected at a time, curing the resin layer by layer until the object is fully printed. It is faster than extrusion printing and less error prone because there is no printing head moving around. According to a foorum four years back, their method was not very differentiated from other SLA printers and it was “all hype”.

**Market**: According to Statista, the 3D printing market is expected to grow by 21.2 percent year-on-year to reach 13.8 billion U.S. dollars by 2019. The market for 3D printers is projected to reach 5.3 billion U.S. dollars.

**Competition**:

1. Formlabs ($103.18M raised, $1.06B valuation)
   1. Big clients are Dyson, Sony, Tesla, Ford, Gillette and Ashley Homestore
   2. Direct competitor, cannot find a difference
2. Shapeways
   1. Outsourcing 3D printing for B2C companies
   2. Specially useful in e-commerce cases because they have an API for ordering the print of an item
   3. They provide help in the design process
   4. THey have a marketplace for selling custom items created by the users and printed in their facilities
3. 3D Systems ($1.37B market cap. HUGE spike in 2015, then back down. THe stock has been almost flat since 1992)
   1. Nylon, SLA and traditional printers
   2. Focused on industry
   3. They offer on demand printing
   4. Big competitor
4. Gizmo 3D
   1. Technically faster and better printing than Carbon, but not as developed on the business and production side
   2. Marketed for consumers or small shops instead of companies
   3. Crowdfunded
5. Markforged ($139M raised, $820M valuation)
   1. Uses traditional head
   2. Is able to print in onyx, glass fiber, carbon fiber and Kevlar among others.
   3. Expensive

**Differentiation/Defensibility**: Their subscription business model is different, but not understanding the technical specifics about the SLA process I cannot find many more. There are other big players in the market doing very similar things.

**Team**: 410 full-time employees in 2020. The leadership team consists of around 24 people. These are the most important:

1. Elisa de Martel (CFO)
   1. Manufacturing Finance Director @ Apple, Finance manager @ Citroen UK and Supervisor @ PWC
2. Craig Carlson (CTO)
   1. Vice President (Firmware and Electrical Integration) @ Tesla Motors and Vice President @ Intuit
3. Philip DeSimone (Co-founder & Chief Customer Officer)
   1. Scout @ Sequoia Capital, Member Board Of Trustees @ Ursinus College and VP of Business Development @ BUYSTAND
4. Alex Ermoshkin (Co-founder & Chief Innovation Officer)
   1. Manufacturing Development Lead @ Liquidia Technologies, Research Associate @ UNC Chapel Hill, Northwestern & Waterloo, and PhD @ Lomonosov Moscow State University
5. Joseph DeSimone (Co-founder & Chairman)
   1. Chancellor's eminent professor of chemistry at North Carolina University, Winner of over 50 awards including 2008 $500,000 Lemelson- MIT award. Founder @ Liquidia Technologies
6. Ellen Kullman (CEO, President & Board Member)
   1. Co-Chair @ Paradigm for Parity, Board Member @ Goldman Sachs, Amgen, Dell, GM & United Technologies, CEO @ DuPont, Marketing @ GE and Sales @ Westinghouse Electric Company
7. Barbara Cadigan (CPO)
   1. Senior Vice President of People @ Talend, Vice President of Human Resources @ Electronic Arts and HR Manager (Sunnyvale and Singapore) @ AMD
8. Edward Samulski Ph.D (Co-founder & Advisor)
   1. CEO & Co-founder @ BlueSky Polymers, CEO & Co-founder @ Allotropica Technologies, Cary Boshamer Professor of Chemistry @ UNC Chapel Hill, Co-founder @ Liquidia Technologies
9. Steve Nelson (Co-founder)
   1. Original CEO. Holds board seats for a lot of companies.

**Open positions for hiring:** Manufacturing Engineer, Marketing Automation & Data Science Manager, Senior Counsel (Transactions), Sourcing Manager and Senior Manager Digital Marketing Operations. [Link to full list](https://www.linkedin.com/jobs/search/?f_C=4802576&geoId=92000000)

**Traction**: Carbon has partnerships with Ford (2015), J&J (2016), Adidas (2017, double dip), Vitamix (2018), Ridell (2019) and Lamborghini (2019). Have already expanded form North America to Asia-Pacific and Europe.

**Business model**: They sell a subscription service for 3, 5 and 7 years. Included are the printer, predictive maintenance and repair, support, software and hardware updates.

**Go-to-market**: They enter markets (physical ones) one by one expanding their area of coverage for their subscription service. They also partner with big companies to produce small parts at a huge scale, in part for growing, and in part to showcase the benefits of additive manufacturing to consumers (e.g. Adidas 4D Futurecraft, fizik bike seat, etc.).

**Press**

1. Adidas unveils Futurecraft STRUNG running shoe with ‘most radical’ 3D printed midsole to date ([TCT Magazine](https://www.tctmagazine.com/additive-manufacturing-3d-printing-news/adidas-unveil-futurecraft-strung-running-shoe-with-3d-printe/))
2. Formnext Connect 2020: Carbon & Fast Radius Expand Strategic 3d Printing Partnership ([3DPrint.com](https://3dprint.com/275454/formnext-connect-2020-carbon-fast-radius-expand-strategic-3d-printing-partnership/))
3. Carbon co-founder DeSimone named Goodyear medalist ([Plastics News](https://www.plasticsnews.com/news/carbon-co-founder-desimone-named-goodyear-medalist))
4. Henkel to validate Loctite materials for Carbon DLS 3D printing technology ([TCT Magazine](https://www.tctmagazine.com/additive-manufacturing-3d-printing-news/henkel-loctite-materials-dls-3d-printing-technology/))
5. Carbon and CCM Hockey 3D print world’s first NHL-certified hockey helmet liner ([3D Printing Industry](https://3dprintingindustry.com/news/carbon-and-ccm-hockey-3d-print-worlds-first-nhl-certified-hockey-helmet-liner-175808/))
6. 3D Printing Remedies Coronavirus Gear Shortage ([Investor’s Business Daily](https://www.investors.com/news/technology/3d-printing-industry-remedies-coronavirus-equipment-shortage/))
7. California Company to 3D Print Air Vents for Lamborghini ([Assembly Magazine](https://www.assemblymag.com/articles/95444-california-company-to-3d-print-air-vents-for-lamborghini))
8. Dinsmore delivers custom 3D printed orthotics to young boy using Carbon 3D printing ([TCT Magazine](https://www.tctmagazine.com/additive-manufacturing-3d-printing-news/dinsmore-custom-3d-printed-orthotic-midsole/))
9. Fizik becomes second bike saddle manufacturer to adopt Carbon 3D printing technology ([TCT Magazine](https://www.tctmagazine.com/additive-manufacturing-3d-printing-news/fizik-bike-saddle-carbon-3d-printing-technology/))