

# HP 3D Printing partners with **SmileDirectClub** to deliver straighter smiles to millions of customers



Data courtesy of SmileDirectClub



In spring 2019, HP and **SmileDirectClub** collaborated to start mass-producing more than 50,000 customized mouth molds per day using HP’s Jet Fusion 3D printers



Data courtesy of SmileDirectClub

## Introduction

SmileDirectClub was the first company to pioneer medical technology in a direct-to-consumer model to revolutionize orthodontic treatment. As a result, they are bringing new smiles to the world through remote, doctor-directed care and an unwavering commitment to customer-first accessibility, convenience, and affordability.

Founded in 2014 and headquartered in Nashville, Tennessee, SmileDirectClub has helped more than 1 million people transform their smiles.

**“SmileDirectClub is digitally transforming the traditional orthodontics industry, making it more personal, affordable, and convenient for millions of consumers to achieve a smile they’ll love,”** said Alex Fenkell, Co-Founder of SmileDirectClub.

All SmileDirectClub clear aligners are FDA-registered and produced using BPA-free materials at certified U.S. manufacturing facilities. SmileDirectClub serves customers in the United States, Canada, Australia, New Zealand, United Kingdom, Ireland, Germany, and Hong Kong.

- **Industry**

Healthcare

- **Sector**

Dental

- **Objective**

To grow demand for SmileDirectClub’s remote clear aligners by increasing production speeds of 3D printed dental molds.

- **Approach**

HP 3D Printing and SmileDirectClub are revolutionizing the age-old orthodontics industry with an all-digital teeth-straightening experience.

- **Technology | Solution**

HP Multi Jet Fusion technology, HP Jet Fusion 4200 3D Printing Solution

- **Material**

HP 3D High Reusability<sup>1</sup> (HR) PA 12

1. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PA 12 provide up to 80% powder reusability ratio, producing functional parts batch after batch. For testing, material is aged in real printing conditions and powder is tracked by generations (worst case for reusability). Parts are then made from each generation and tested for mechanical properties and accuracy.



Data courtesy of SmileDirectClub

## Challenge

SmileDirectClub had a clear aligner production method in place since its inception in 2014, but due to their growing customer base, the company needed a manufacturing technology that would allow them to meet the increasing demand. Their previous technology produced delicate, fragile 3D-printed parts at slow speeds and high costs.

**“When we began manufacturing, the volume output over a 24-hour time frame was low and we needed to find a way to rapidly increase our capacity to meet demand, while keeping**

**an affordable cost structure to pass along to our customers,”** said John Dargis, Vice President of Research and Development for SmileDirectClub.

This led Dargis and his team to research technologies that would enable them to mass-produce molds to create clear aligners, and thus deliver orthodontic solutions to customers more quickly.

According to Dargis, **“HP was able to answer these problems for us.”**

## Solution

SmileDirectClub is disrupting the orthodontics industry with a digital-first business model, pioneering a teledentistry platform that allows an affiliated network of licensed dentists and orthodontists to provide remote teeth-straightening care using 3D images to prescribe treatment, 3D printing to manufacture molds for clear aligners and retainers, and an on-demand style of delivery direct to consumers’ doorsteps.

SmileDirectClub creates a 3D image of customers’ teeth to view the current alignment and develop a plan to align the customer’s smile. There are two ways to make a 3D image: a customer can visit one of the 360-plus SmileShops to scan their smile, or the company can build the scan from an impression that customers take using a remote impression kit. The customer’s 3D smile is

reviewed by a licensed dentist or orthodontist, who will guide their new smile from beginning to end—with a treatment plan that lasts, on average, 6 months. SmileDirectClub then uses HP Jet Fusion 3D Printing Solutions to produce customized mouth models to be used as molds for the clear aligners.

When the first in-house printing solutions were installed, HP technical teams engaged SmileDirectClub engineers to understand design intent, validate the application, and help redesign parts to meet customer requirements. HP staff were onsite to conduct training to enable the company to meet its goals of scale and productivity

## Result

**“Our relationship with HP 3D printers has fast-tracked scale,”** Fenkell said. **“Collaborating with HP on a faster, more efficient, and high-quality 3D-printed product has enabled us to meet customer demand.”**

HP 3D Printing has helped SmileDirectClub accelerate their growth, enabling a new era of personalized consumer experiences only made possible by industrial 3D printing and digital manufacturing.

HP Multi Jet Fusion technology has made it possible for SmileDirectClub to transform more than 1 million smiles since launching in 2014. In spring 2019, SmileDirectClub doubled its fleet of HP Jet Fusion 3D Printing Solutions to become the largest producer of 3D-printed products in the United States.

**“HP’s breakthrough 3D printing makes this level of disruption possible for us, pushing productivity, quality, and manufacturing predictability to unprecedented levels, all with economics that allow us to pass on savings to the consumers seeking treatment using our teledentistry platform,”** Fenkell said.

SmileDirectClub also benefitted from decreased production costs with HP Multi Jet Fusion: **“We are able to produce the**

**parts at a high volume and a cost point lower than any 3D printer to date,”** Dargis said.

The thinner walls and lower arch height result in a higher packing density of 3D printed molds, and with HP 3D HR PA 12, the strength of the parts ensures low breakage during the molding process.

**“By printing functional parts at the individual voxel level, HP offers us an unprecedented ability to transform part properties and deliver mass customization,”** said Dargis.

SmileDirectClub anticipates printing nearly 20 million molds during the next year and hopes to expand its services beyond its current customer base. The company is also working with HP to develop a new software package that would help them manage and analyze 3D printing operations data within the machine (rather than after the parts are printed) to achieve a more holistic view of their fleet of 60 printers.

**“The partnership of SmileDirectClub and HP will continue to open doors to democratizing access to affordable and convenient teeth-straightening solutions,”** said Fenkell.

Connect with an HP 3D Printing expert or sign up for the latest news about HP Jet Fusion 3D Printing [hp.com/go/3Dcontactus](http://hp.com/go/3Dcontactus)

Learn more about SmileDirectClub at [smiledirectclub.com](http://smiledirectclub.com)

Learn more about HP Multi Jet Fusion technology at [hp.com/go/3DPrint](http://hp.com/go/3DPrint)

