

# Additive manufacturing trend report 2021

3D printing market growth  
in the year of the COVID-19

# Key findings

## \$12.6bn

was the estimated value of the 3D printing market in 2020.

## 21%

was the estimated YoY 3D printing market growth in 2020.

## × 2

The 3D printing market is expected to more than double in size over the next 5 years, reaching a value of \$37.2bn in 2026.

# 65%

of engineering businesses sourced or produced more 3D printed parts in 2020 vs 2019.

## 84%

of engineering businesses used 3D printing to produce functional end-use parts more (54%) or the same (30%) in 2020 vs 2019.

## 73%

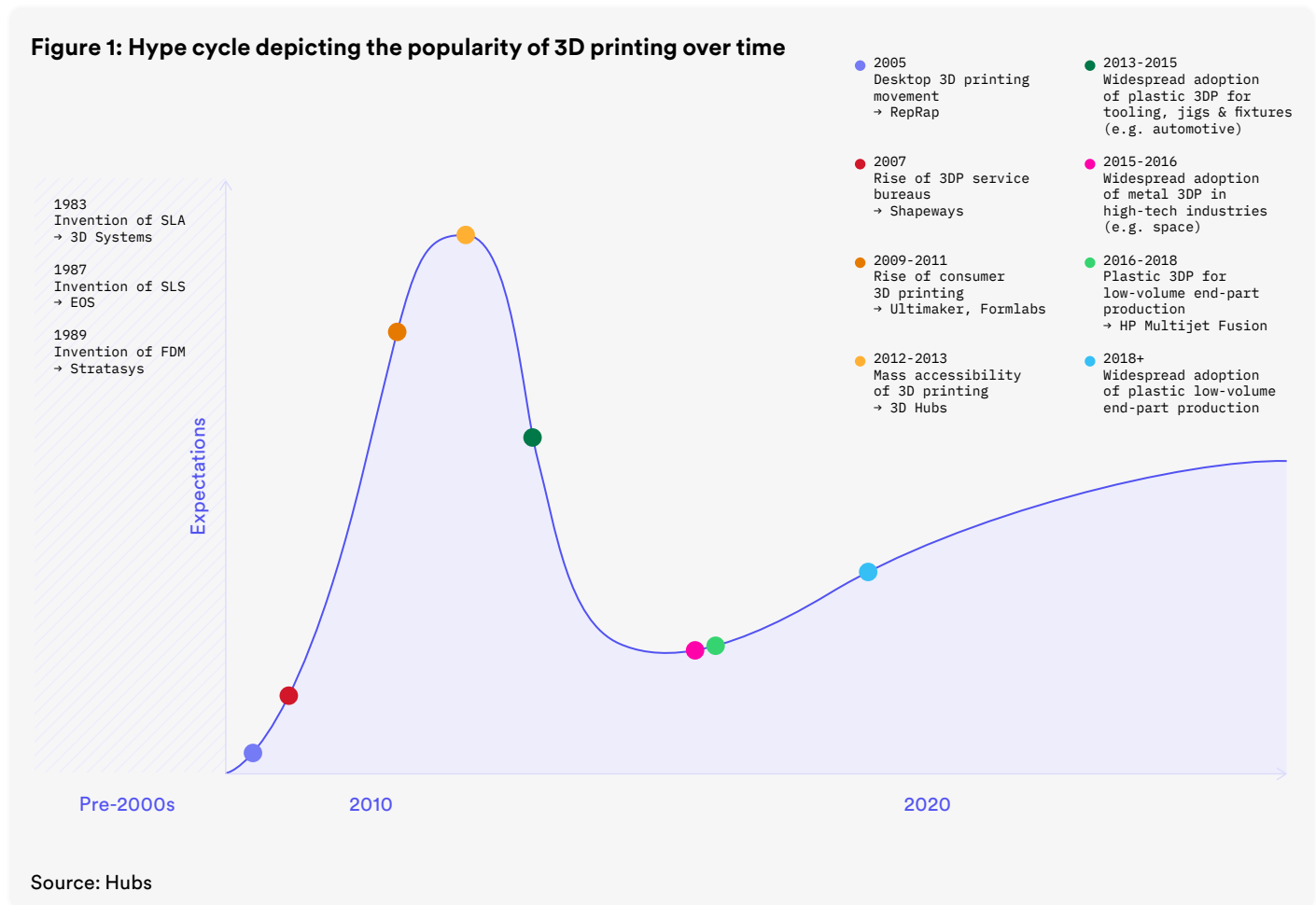
of engineering businesses predict they will produce or source more 3D printed parts in 2021 versus 2020.

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# Introduction

## How the additive manufacturing industry evolved in 2020



**Additive manufacturing**, also referred to as 3D printing or Rapid Prototyping, adoption has been on a steady growth path as increasingly more engineering businesses take advantage of the technology's benefits, including:

- Fewer design restrictions than traditional manufacturing technologies
- Increased opportunity for local production
- Relatively low start up costs

Following its initial hype of widespread consumer adoption ten years back, additive manufacturing is proving its value to engineering businesses year-over-year. In more recent years, 3D printing has made leaps by not only serving as a prototyping technology, but also as a better alternative in some cases to replace functional end-use parts.

# The 3D printing industry in the year of COVID-19

After almost a full year since the initial outbreak of the coronavirus pandemic, it's been an interesting time to observe the adoption of 3D printing. The technology is still not completely established in engineering businesses' workflows and demand in certain industries heavily fell.

Simultaneously, 3D printing gained [mainstream exposure](#) due to the difference it made in rapidly producing PPE during the beginning of the outbreak. Global [supply chain disruption](#) made it more difficult to source parts from overseas and forced businesses to consider more local solutions, which included 3D printing, for both prototyping and end-use parts. The 3D printing industry hasn't been completely resilient to the past year's challenges but is nevertheless set to continue growing 17 percent year-over-year in the next three years.

This report, which is a new edition of the '3D Printing Trend Report' Hubs has published annually for the last three years, aims to review the overall expected market growth, including the impact of COVID-19, as well as uncovering the areas of high demand and barriers the industry still faces.

# Methods and approach

## Data sources and analysis featured in the report

Data from 3 main different sources were collected to produce this report:

- A survey conducted by Hubs with 1,504 engineering businesses
- A systematic review of the news reported by the media
- Market trends through a comparison of market analyst reports

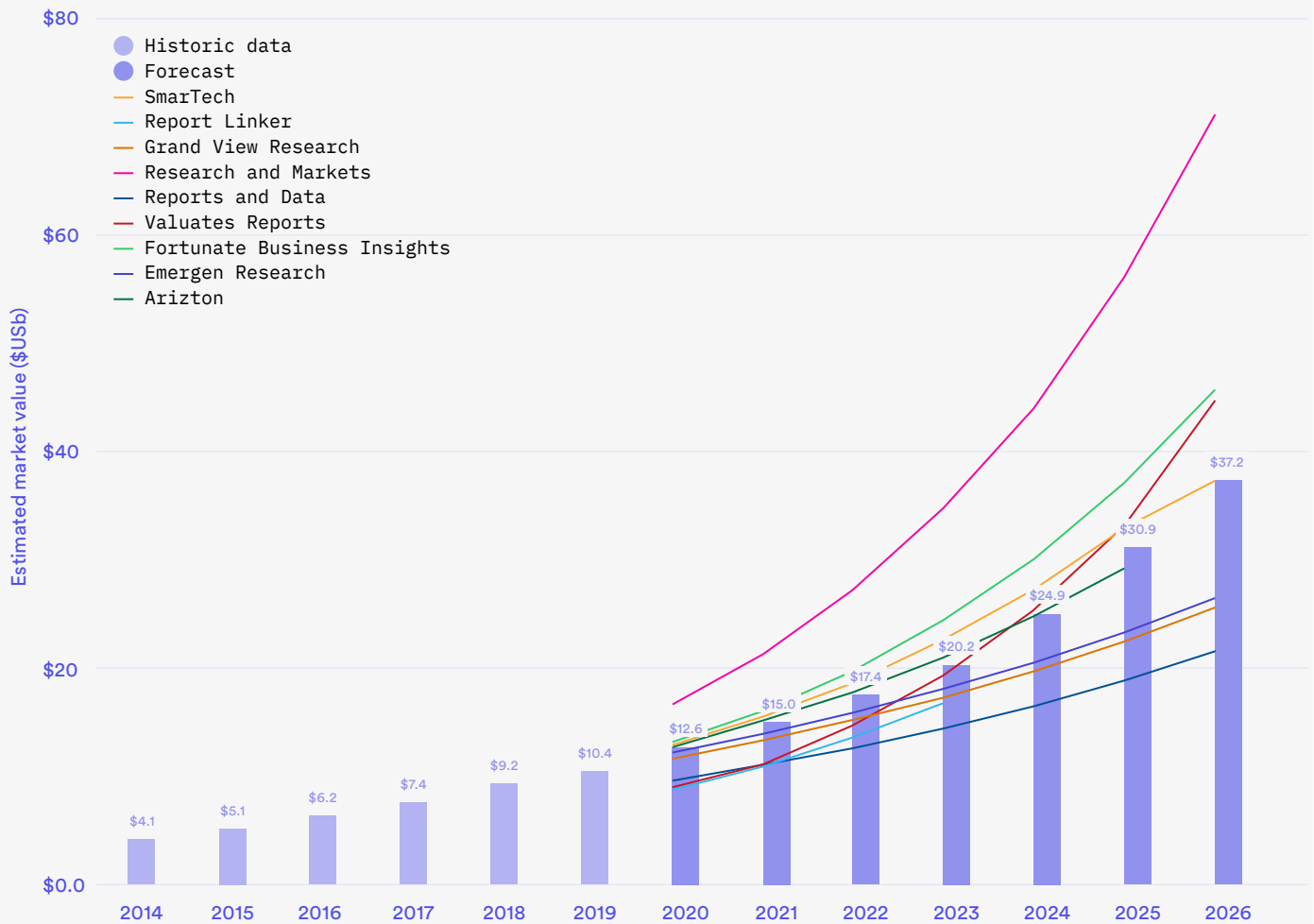
The survey, conducted in February 2021, aims to provide an up-to-date view on the 3D printing industry, following the disruptions and opportunities the coronavirus pandemic has created.

The review of the news provides an overview of the direction of the industry with an emphasis on the progress of large enterprises. These early industrial adopters are at the forefront of the technology and drive cutting-edge innovation and market growth.

Market analysis gives an overview of the financial forces that drive the growth of 3D printing technologies. By comparing the results of multiple reports – all released in 2020 and 2021 – a more holistic picture of the current state and direction of the market can be drawn. The sources of the reports used in this year's edition are [Wohler Associates](#), [ReportLinker](#), [SmarTech](#), [Research and Markets](#), [Reports and Data](#), [Valuates Reports](#), [Fortune Business Insights](#), [Emergen Research](#), [Arizton](#), [Grand View Research](#).

# Market growth

Figure 2: 3D Printing market forecast



Footnote:

- \* The historic market size was calculated by averaging the market size reported by Wohler's Associates<sup>[01]</sup> and SmarTech<sup>[04]</sup>.
- \*\* The forecasted market size in the median market size reported by all market analysts.
- \*\*\* Links to all sources can be found under the References section of this report.

The graph above summarizes data reported by nine reputable market analyst firms that evaluated the additive manufacturing market segment in 2020, including revenue from 3D printing systems, software, materials and services, but excludes internal corporate investments in 3D printing technologies. It was constructed based on publicly available information and it provides the best estimate of the current size and future potential of the global 3D printing market by combining data from different sources.

The global 3D printing market in 2020 was estimated at \$12.6bn on average, ranging from \$8.4bn to \$16.6bn. These widely varying predictions are largely tied to the report publication date in relation to the impact of the coronavirus outbreak. Reports published nearer to the beginning of 2020 tend to offer a more optimistic view point compared to forecasts later in the year.

*21% was the estimated YoY 3D printing market growth in 2020*

The resulting estimate of \$12.6bn is approximately 22 percent lower than the figure forecasted in our 2020 edition of the [this report](#), but nevertheless a 21 percent year-over-year growth since 2019. Over the next three years, on average, analysts expect the 3D printing market to grow by 17 percent year-over-year, again lower than predictions made in 2019 and even lower than 2020, but continue the trend of growth, reaching \$37.2bn in 2026.

# Impact of coronavirus outbreak

## Spotlight on how COVID-19 affected 3D printing adoption

*83% of engineering businesses increased or maintained their 3D printing usage following COVID-19*

COVID-19 had an undoubtable short term negative impact on the growth rate of the 3D printing market, due to remote working, social distancing, and supply chain disruption. However, the market is expected to recover in the coming years.<sup>[03]</sup>

This optimism is also backed by a survey conducted by Hubs that concluded that, as a result of the coronavirus pandemic, 33 percent of engineering businesses increased their 3D printing usage, and 50 percent of engineering businesses maintained their usage.

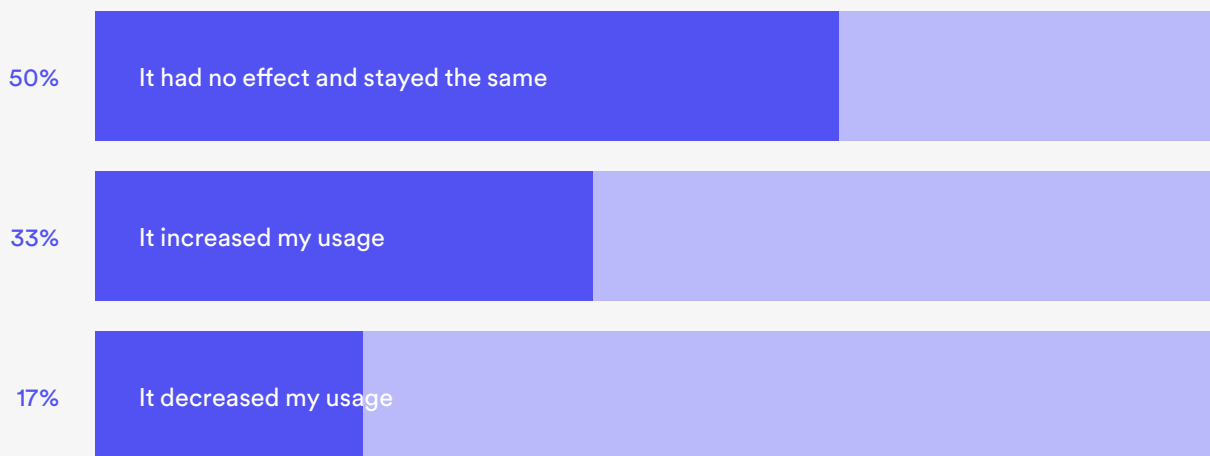
This is surprising given the overall 3D printing market growth was below projections. According to the survey, the uptick in 3D printing was caused by more than usual downtime for engineering businesses, due to COVID-19 which led teams to focus more time on R&D, testing and prototyping. Disruption to overseas sourcing also caused more engineering businesses to consider increasing their 3D printing usage, as lead times for machined and injection molded parts were too long, and chose either to print in-house or outsource to a local 3D printing company or service bureaus such as Hubs.

Another significant factor for this rise was the enthusiasm from the 3D printing community to fill the much-needed gap in supply for PPE, with many engineers dedicating resources to producing face shields and masks.

On the flipside, the primary reasons behind 17 percent of engineering businesses utilizing 3D printing less because of the pandemic were an overall lack of demand resulting in fewer orders or projects being put on hold. A secondary cause was the lack of accessibility engineers had to necessary equipment and physical workspaces in order to design and produce 3D printed parts.

It's possible that smaller, perhaps more agile, businesses increased their 3D printing usage more during this past year of disruption, which contributed to the growth of the 3D printing usage per organization, but not to the overall market value.

Figure 3: The effect of COVID-19 on 3D printing usage



Q: How did COVID-19 affect your 3D printing usage?

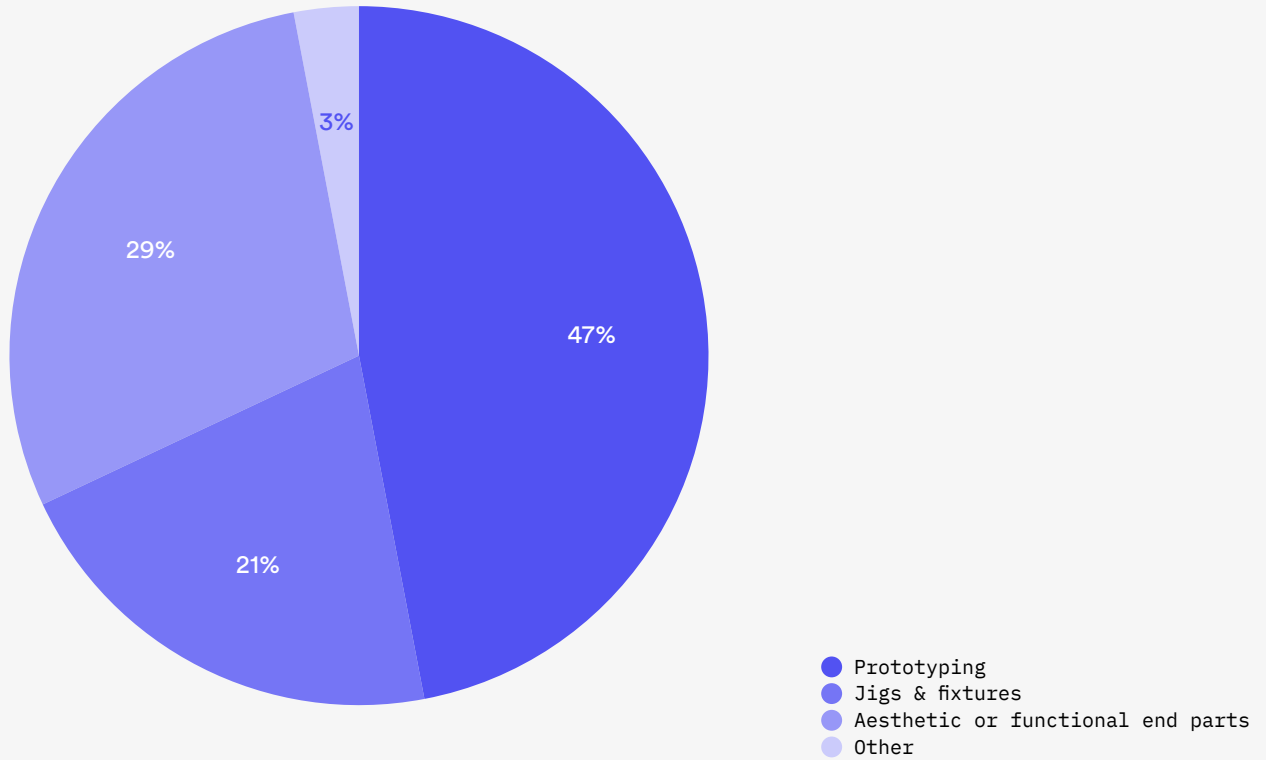
Source: Hubs survey, conducted February 2021, n = 1,504



# From prototype to production

## Trends in 3D printing used for functional end-use parts

Figure 4: 3D printed parts produced by application

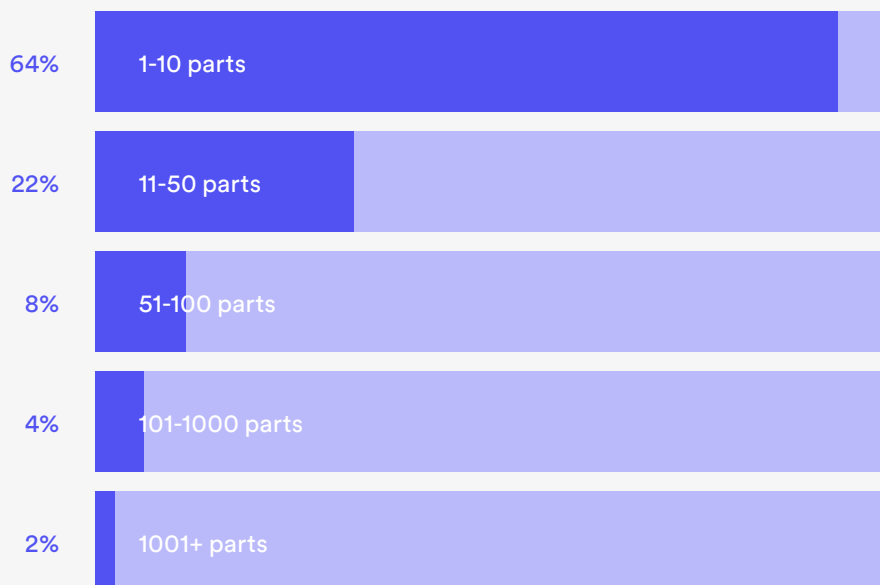


Q: Which applications do you use 3D printed parts for?

Source: Hubs survey, conducted February 2021, n = 1,504

Every year, engineering companies are continuing to see the benefits of 3D printing not only for prototyping, but increasingly for end-use parts. At the moment, 3D printing is primarily used for prototyping, however aesthetic or functional end parts are not far behind (see Figure 4). This same trend is also echoed by the amount of 3D printed parts produced in one order, with the majority of engineering businesses creating 1-10 parts per production run (Figure 5), suggesting they are mainly used for prototyping and testing, with other manufacturing processes used for mass production.

Figure 5: Size of 3D printing production runs



Q: How big are your production runs of 3D printed parts?

Source: Hubs survey, conducted February 2021, n = 1,504

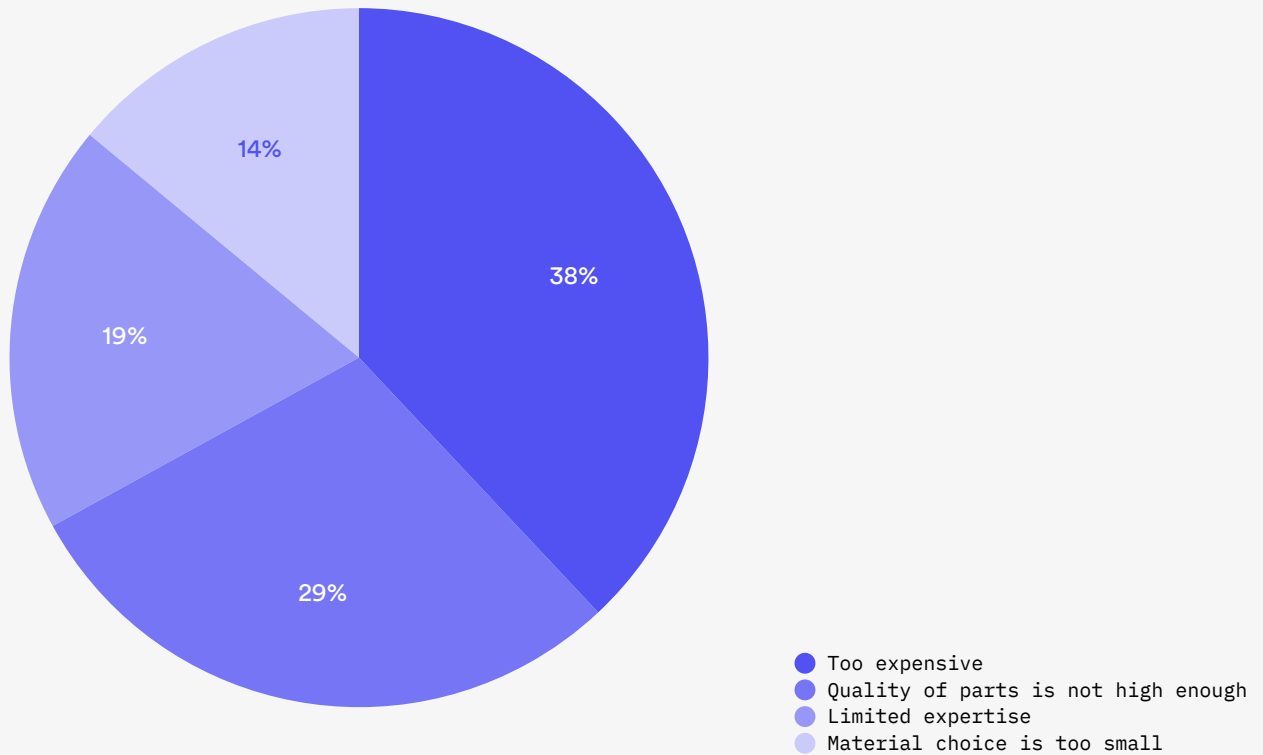
54 percent of engineering businesses reported they used 3D printing to produce functional end-use parts more and 30 percent of engineering businesses reported they used 3D printing to produce functional end-use parts the same in 2020 compared to 2019, suggesting this trend will continue at a fast rate.

Industries that reported the largest increase included biotechnology, transportation and automotive. Biotechnology and automotive are industries that especially benefit from the design complexity 3D printing offers, while the transportation industry tends to use 3D printing more for creating spare, custom parts that are otherwise hard or expensive to source.<sup>[12]</sup> Aerospace & aviation, two industries known for their adoption of 3D printing, did not feature on this list, but this could be down to the factors related to the coronavirus pandemic and a cut of resources on those specific industries rather than not adopting 3D printing for end-use parts.

# The future of 3D printing

Looking ahead to years ahead and the barriers to overcome

Figure 6: Barriers to implementing 3D printing more



Q: Which factors prevent you from using 3D printing more?

Source: Hubs survey, conducted February 2021, n = 1,504

The industry is set to continue on its path of growth with 73 percent of engineering businesses predicting they will produce or source more 3D printed parts in 2021 compared to 2020. However, there are key barriers that hold adoption back, predominantly the price of 3D printed parts.

Compared to more traditional manufacturing processes, like injection molding and urethane casting, 3D printing will always come at a higher price point per part for high volumes. However, industries when design complexity can greatly increase the strength-to-weight ratio and even cut down the overall costs by making more efficient parts.

Metal 3D printing, including DMLS and SLM, generally comes at a much higher cost, but new materials and techniques are rapidly being developed in this area which could start to bring the price down.

Besides the barriers that prevent some 3D printing usage, we also looked at how some of these limitations might be overcome already in 2021 and how the 3D printing market could develop. We asked 1,500+ 3D printing users in our community to predict how they think the industry will evolve this year. A selection of their predictions is provided below.

*Increasingly more end-use metal parts will be printed*

– Abimelec Mercado, Hardware Engineer at Honeywell

*3D printing will continue to mature and become more affordable*

– Austin Doupe, Manufacturing Engineer at EnCore, A Boeing Company

*3D printing will become cheaper and consequently will be used for many more applications*

– Alexander Hager, Quality Manager at Siemens AG

*Hybrid manufacturing (a combination of additive manufacturing and subtractive manufacturing) will make bigger strides*

– Tyson Fogel, Autodesk

*Improved accessibility to "exotic" materials for FDM*

– George Walbyoff, Airbus Helicopters UK

*The amount of available surface finishes and alloys in 3D printing will increase*

– Vinay G R, Senior Engineer at GKN Aerospace

*3D printing will be used more for end-use parts*

– Ross Adams, Application Engineer at Markforged

*Material freedom will increase and workflow software will improve*

– Bart van As, Product Manager Materials at Ultimaker

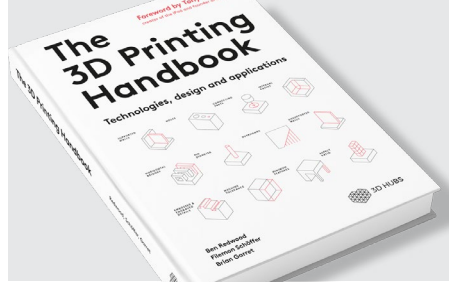
# Further reading

Gain more insights and practical tips within the manufacturing space



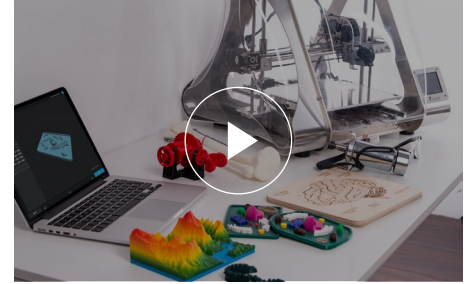
3D printing: The complete guide

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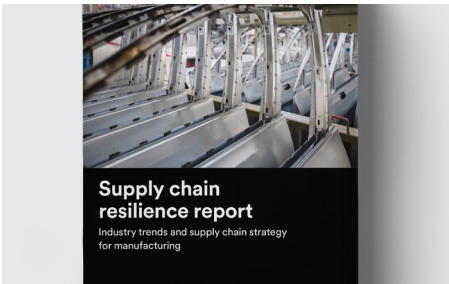
The 3D printing handbook

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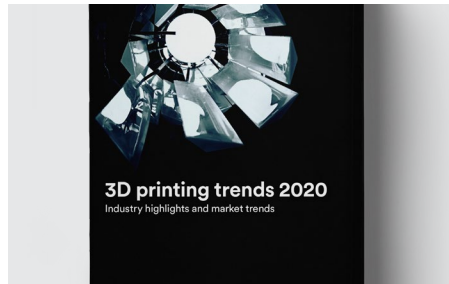
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# About this report

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## About Hubs

[Hubs](#) is an online manufacturing platform that provides companies with on-demand access to a global network of premium manufacturing services. Users can easily upload their design, instantly receive a quote, and start production at the click of a button.

Founded in Amsterdam in 2013, Hubs was acquired by Protolabs in January 2021. To date, Hubs has produced more than 6 million parts, using various manufacturing technologies, including CNC machining, 3D printing, sheet metal fabrication and injection molding.

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