Third Edition **THE STATE OF 30 BALTICE 2021**

Insights and trends into the growing

industrial 3D printing world



The Current State of 3D Printing

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RESPONDENTS AND VERTICALS

Engineering and design	
services companies	20%
Manufacturing	20%
Industrial machinery	. 18%
Education	6%
Consumer goods	6%
Medical	4%
Automotive	4%
Electronics	2%
Injection moulding	1%
Energy	2%
Other (R&D, architecture,	
aerospace)	17%

Highest number of 3D print users

94% of survey takers now using 3D printing in their company.

Now in its third year, we continue to look at how 3D printing is used in the region. We want to know who is using 3D printing, what technologies are used and what the barriers are for those who haven't yet invested. By understanding the impact of industrial 3D printing, we can set a course going forward and reap the benefits of this increasingly useful technology. This year, we also compare numbers with those from the two previous years, where applicable. In November and December 2020, we ran a survey to both customers and non-customers. These came from several industry verticals and respondents had several different job titles. In total, 198 people in the Nordics and Baltics took our survey. The analysis was carried out by me and the 3D printing team here at PLM Group. We hope you will find it insightful and helpful.



"By understanding the impact of industrial 3D printing, we can set a course going forward and reap the benefits of this increasingly useful technology."

Mattias Kristiansson, author of the survey, PLM Group







(23%) **21%** True game changer



How valuable is 3D printing

We provided respondents with four choices of how successful they think their 3D printing usage is, from game-changer, to no improvements. Comparing with the numbers from 2019, there's little fluctuation, and a clear majority of our respondents feel that 3D printing is adding improvements and benefits.

In global surveys, a successful use of 3D printing typically scores high, and clearly enough, this is also the case in the Nordic and Baltic countries, as you can see from the results.

2019 numbers in brackets.

Most used technologies

FDM, Fused Deposition Modeling, is the most used technology. Compared to 2019, FDM has increased and now stands for 64% of all use (61%). FDM is a typical entry-level technology, and there is a large number of suppliers in this area.

Composite printing is stable at 30% (31%). This is good, because it shows that companies value the mechanical properties this technology allows for and the application areas, such as jigs and fixtures.

There is a clear rise in the use of MJF technology from HP. This indicates more companies moving into production print. Metal 3D printing saw a big growth, now at 21% (13%).

The biggest surprise is the use of SLA, stereolithography, that grew from 22% in 2019, to 36% in 2020. Stereolithography has seen a transformation in the past few years, with a number of 3D printer developers launching new platforms with new technology and a growing materials portfolio that better caters to industrial use and the production of end-use parts.



3D printed applications

Today, 3D printing is used all across the product lifecycle. Looking at global figures, 3D printed end-use parts is the fastest growing area, followed by production tools (jigs, fixtures and robotic grippers). Prototypes holds its ground and spare parts is still a very much untapped area, where we expect to see more growth in the future as digitalization and smarter supply chains continue to evolve.

As we can see from our current survey, all measured application areas are pretty stable, with some decline, due to companies halting 3D print projects and thereby printing less. The winner is still prototyping, which saw a rise. Astonishingly, 94% of our survey takers are using 3D printing.

All in all, the numbers should be seen in light of the pandemic, and we expect all areas to grow in 2021, as companies bolster their supply chains for better preparedness.









(29%) **19%** High performance plastics

Metals

19%

(12%)

Which materials are used

In the past few years, materials for 3D printing has seen a tremendous growth, both in the amount of materials, but also in terms of sales.

Globally, plastic is the most used material, accounting for roughly 80% of all 3D printing. Plastic materials come in all shapes and sizes. There are powder based materials, liquid resins and filaments. Plastics can also be divided in to basic plastics and high performance plastics. Basic plastics can be ABS, PLA and polyamide, or PA. High performing plastics are often composites, where you add another material to get more strength or impact resistance.

The most used high performance plastics are carbon fiber reinforced composites. There is also intensive research in heat deflecting plastics, such as PEEK, Polyether ether ketone, a thermoplastic with good mechanical and

2019 numbers in brackets.

chemical resistance properties that are retained to high temperatures.

Our material question is multiple selection, because companies often use more than one material. Basic plastic is the most widely used material. 83% (91%) of the respondents are using the material, actually down 11 percentage points from 2019, which can be attributed to a decrease in the overall 3D printing usage due to the pandemic.

High performance plastics also dropped 2019, to 19% (29%). It is still a solid number, as these materials are mainly used for production tools, functional prototypes and end-use parts.

Comparing 2019 with 2020, we see a slight increase in the use of metal materials, from 12% to 19%. This is mainly due to more metal systems on the market, a consequence of more cost-efficient and accessible technologies.

Benefits of 3D printing

Lead time reduction even more important and supply chain on the rise.

With the design and production freedom that 3D printing entails, there are several benefits of using the technology across the product lifecycle. One benefit that often score the highest in surveys is lead time. In our survey, this number has increased from 74% in 2019, to 89% in 2020. The rise goes hand in hand with the results from our previous question about what applications companies 3D print, where prototypes was the clear winner.







The second largest benefit according to our respondents is cost reduction, which saw an 8 percentage point increase compared to 2019. Optimizing your cost is always on your priority list, but it became even more apparent in 2020 and will most likely continue to do so.

The increasing importance of supply chain

Supply chain optimization took a big jump to 26% (17%) 2019. This was one of the few things we actually expected in the light of supply chain challenges for many manufacturing companies in 2020. We also expect this number to rise in the future, as a long-term effect from the pandemic. Related to supply chain is local production, which saw a modest rise from 20% in 2019 to 31% in 2020.

With more industrial materials, 3D printing enduse parts is becoming a reality for an increasing number of manufacturing companies. Not being burdened by inefficient logistics operations or extreme lead times for your components act as a spur to use more 3D printing inhouse or order from a local service bureau.

Obstacles moving in to 3D printing

There are many hurdles along the way before investing in 3D printing. The first question you need to answer is to make sure there is a clear business value in 3D printing. The business case must be finalized before you discuss what printer to use. Secondly, you need a sound knowledge platform about the possibilities and the limitations of 3D printing. We asked these two questions, and it's clear that the majority are up to speed on both 3D printing and its business value. But many people said printer and material price as a challenge. Other issues were unit price, material certification and design for 3D printing.

85% feel they have enough knowledge about 3D printing

61% see a clear business value in using

value in usin 3D printing clear

> 15% feel they DO NOT have enough knowledge or were not sure

39% DO NOT see a clear business value in using

3D printing





Critical business factors

Print quality still most important to most companies and expected from an industrial 3D printer.

Part of building a business case for 3D printing, users weight a number of factors. We had the respondents rank seven common factors that are usually taken into account before you invest in a 3D printer.

Print quality is listed as extremely or very important (compounded number) by 60% (72%). 32% (24%) said print quality is somewhat or not so important. We conclude that high print quality is something professional users expect from industrial 3D printing, as they use it in more and more areas.

33% (33%) see width of materials as extremely or very important, which is the same as for 2019. 56% (60%) see material range as somewhat or not so important. A reason for this change could be that more people move into production, where a few, reliable materials are more important than a wider materials portfolio to achieve whatever production they are working with. Print speed varies a great deal among the different 3D printer technologies. Some offer fast output, while others sacrifice speed for geometric accuracy, surface finish or range of materials.

30% (42%) see print speed as extremely or very important. Comparing with the previous question on applications, it could be linked to an increase in prototyping use 2019, which isn't necessarily as time-critical as other print applications, such as production tools or spare parts.

Accuracy still holding the high ground

Accuracy, or to be more specific, geometrical accuracy, is still important to 3D printing users. 76% (82%) see it as extremely or very important. It's a slight dip compared to 2019, but still a very large number, revealing the high demands people put on their 3D printer and 3D printing in general. It is far more important than any of the other six properties we asked about in our survey.

Size doesn't matter

There are 3D printers for very small and highly detailed parts, and large printers for car parts

or airplane interiors. But the majority of printed parts are neither that small or large. In our survey, 44% (52%) listed build size as extremely or very important, while 47% (44%) see it as somewhat or not so important.

The power of strength

Material strength is useful when you are 3D printing parts for functional testing, tools or enduse. 59% (68%) of the respondents see material strength as extremely or very important. Once again, this correlates with applications such as end-use parts, spare parts and jigs & fixtures declining 2019.

Local support handled inhouse

Local partners and support can be business critical if you run a large 3D printing setup and print end-use parts that are going into your core business. 32% (33%) see local support as extremely or very important. 54% (58%) see local support as somewhat or not so important. This might indicate that companies rely on their inhouse competence and/or that they still do not produce at scale using 3D printing.



2019 numbers in brackets.

When to invest

34% (50%) of companies are planning to invest in 3D printing in the next three years. That is a decrease to the numbers from 2019, but fully understandable in light of the pandemic. Knowing when to invest is depending on a number of variables – from budget to organizational challenges. From a technology perspective, there are virtually no major obstacles from moving in to using 3D printing at any stage of the product lifecycle – from prototypes to spare parts.





What to invest in

Today, 3D printing has less to do with just the printer, and more about the applications and ecosystem. Just look at the numbers for cloud software, which is on the rise. People want to be connected - from design to print, in all departments.

We asked respondents to tell us about their investment plans according to solution type. We covered what we see as the most vital parts in the 3D printing processes.

There are no major fluctuations year on year. It is interesting to note that 17% plan on investing in postprocessing in the next three years. Postprocessing printed parts is called "3D printing's dirty little secret", as it is a manual and time-consuming process. It involves steps like cleaning, sanding, pelting, dyeing and more, to get a part in to a desired shape or surface quality, depending on final usage. Also noteable is training at 46%. As 3D printing matures, demand for 3D print operators will rise.



How is 3D printing used

2020 made us rethink our supply chains, but also the impact of 3D printing in healthcare.

The global use of 3D printing was down 2020, also visible in our survey. In 2020, 52% answered that they use their own printer, which is a decline from 2019 (81%) and 2018 (63%). Many projects with 3D printing were put on hold, due to the pandemic. Also, according to research firm CONTEXT, one of the biggest 3D print adopters, the aerospace industry, was hit hard by COVID-19 in 2020.

Comparing users who both own a 3D printer and buy 3D printing as a service with 2019, we see that numbers have also dropped to 14% (20% in 2019). If we take a look at companies using 3D printing as a service, we also see a drop from 26% in 2019, to 13% in 2020.

On the bright side, 10% stated that they planned to invest in the future, which is a slight increase from 2019, where 7% said they were planning to invest.



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Conclusion

Despite the disruptive nature of 2020, 3D printing in the Nordic and Baltic region continues to grow and global reports show the same. The market watch company ReportLinker estimates a 19% market dip in 2020, but at the same time an 18% annual growth between 2020-25.

Here at PLM Group, our team of 3D printing experts have helped numerous companies in different industries - from scratch to a highly successful installation. For many, it has revolutionized product design, product development and the manufacturing of end-use parts. Although the majority in our survey felt their company knew enough about 3D printing, there's always room and opportunity to learn more. Especially as the 3D printing industry is moving rapidly, moving into new industries and application areas.

> PLM Group's 3D printing experts are happy to guide you to how 3D printing could benefit your company.

> > **GET IN TOUCH!**



igodol

EMPLOYEES 140

NUMBER OF OFFICES

REVENUE *35 million Euros*

PRESENT IN Sweden, Denmark, Norway, Finland, Iceland, Estonia and Latvia

www.plmgroup.eu

About PLM Group

We help manufacturing companies and product developers in building best in class additive manufacturing solutions – from prototyping to end-use parts. We have a passion for optimizing processes and helping companies generate new business.

We are a Nordic 3D solutions company and the largest Dassault Systémes partner in the region. We work with top 3D printing brands, such as HP, Markforged and 3D Systems. With 25 years of experience, we are born from 3D.

Partnering with us gives you access to the brightest minds in 3D printing.

We have a track record in delivering market-leading solutions, excellent service and business model insights that give companies a competitive edge and help them flourish.



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