

3DOP brings 3D printing closer to production

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From Promise to Industrial-Scale 3D Printing Production

3D printing offers businesses a wealth of opportunities, but there is still a wide gap between promise and production – in areas such as cost, quality, automation and post-processing. The European 3DOP project brought together 33 partners from eight countries to remove those barriers. Now that the project has been completed, a new brochure summarises the key results, insights and next steps.



Download the 3DOP brochure

Discover how 3DOP helps companies explore the potential of 3D printing and turn opportunities into concrete applications.

Download the 3DOP brochure

Discover the Project Results

Discover how 33 European partners joined forces to advance industrial 3D printing applications.

Learn more

What to expect?

- Why 3DOP was set up
- What results the project delivered
- How 3D printing is moving closer to industrial application
- What challenges still remain
- Why the brochure is relevant for manufacturing companies

From pilot project to industrial application

Nowadays, 3D printing is much more than just a technology for prototypes. Companies are increasingly using additive manufacturing for functional parts, smart products, repairs and bespoke manufacturing. However, scaling up is not a foregone conclusion. Printing a component is one thing. Reliable, affordable and repeatable production in an industrial setting is a different matter altogether.

That was precisely the focus of 3DOP, which stands for 3D Printing Optimised Production. The project investigated how 3D printing can become easier to use in manufacturing environments. The partners worked on areas including metal printing, smart moulds, embedded electronics, dental applications and automated post-processing.

The final brochure provides a clear overview of the entire process, covering the demonstration models, results, challenges and lessons learnt for companies wishing to make further use of 3D

printing in their production processes.

A European network of 33 partners

3DOP brought together 33 partners from eight European countries. The consortium comprised research institutions, technology suppliers, demonstration facilities, cluster organisations and companies that use 3D printing in practice. That broad cooperation was necessary. 3D printing isn't just about machines or materials. Automation, software, quality control, financing, training and market knowledge are also factors in determining whether a technology succeeds.

Within 3DOP, regional strengths were linked together. Partners from countries including Belgium, Croatia, Germany, Italy, the Netherlands, Poland, Slovenia and Spain worked together to develop new value chains. In this way, a network came into being that extends beyond the project itself. Companies gained access to expertise, testing facilities and partners that would have been much harder for them to find on their own.



Making metal printing more affordable

A significant part of 3DOP focused on 3D printing with metal. This technology is of interest for strong, lightweight and complex components. However, cost remains a barrier for many companies. The partners therefore investigated how metal 3D printing could be made cheaper and more sustainable. They looked at new printing methods, recycled metal powders and ways to repair existing parts.

That last point is particularly important. Instead of replacing expensive metal components, companies can repair or upgrade them using additive manufacturing. This extends the service life and reduces material wastage.

Among other things, a 3D-printed catalytic system for air purification was developed to market-ready status as part of the project. The technology even led to the first customer orders, demonstrating that research findings really do find their way onto the market.

Read more in the brochure

Discover how 3DOP is advancing cost-effective and sustainable metal additive manufacturing applications.

Download the 3DOP brochure

Smarter moulds and products

3DOP also investigated how 3D printing offers new possibilities for moulds, tools and smart plastic products. For example, the partners worked on 3D-printed moulds with built-in temperature sensors. Sensors like these provide greater insight into the production process and help to improve quality control.

Another demonstration model centred on a 3D-shapeable lighting panel, with flexible LED films being integrated into a moulded plastic component. This shows how electronics can be incorporated into a product right from the manufacturing stage.

This approach opens up new opportunities for various sectors, such as mobility, interior applications, consumer electronics and smart plastic components. The result is more than just a technical experiment. 3DOP demonstrates how additive manufacturing makes products smarter and more functional.

Automation for dental manufacturing

The dental sector is already making extensive use of 3D printing. Crowns, aligners, implants and other treatments often require a bespoke approach, making the sector an attractive prospect for additive manufacturing. At the same time, production often remains labour-intensive. Many steps are still carried out manually, which limits scalability and increases the risk of errors.

Within 3DOP, partners therefore worked on the building blocks for an automated dental production line. Among other things, they developed a vision-based control system and an automated transport system,

which inspect, move and process 3D-printed dental components. This brings us closer to a more digital and automated workflow. The brochure also highlights the challenges that remain, such as inspecting shiny metal parts. Very small and fragile parts also require careful handling. Still, the direction is clear: automation makes dental 3D printing faster, more consistent and easier to trace.



Post-processing as a barrier to scaling up

When people think of 3D printing, they often look at the printer first. In practice, however, much of the production time takes place after the printing process. Parts must be identified, sorted, inspected, finished, packed and dispatched. Many of those steps are still carried out manually, and this is holding back the scaling up of additive manufacturing.

That is why 3DOP placed a strong emphasis on automated post-production. The partners developed modules for component recognition, sorting, quality control and packaging. Those solutions were tested in real-world production environments. Some of them have evolved into market-ready applications and initial commercial implementations.

This is of great importance: less manual work results in shorter lead times, fewer errors and more consistent quality. It means we are one step closer to the digital 3D printing factory.

More than just technology

3DOP did not merely yield technological results. The project also provided a significant boost to investment. Originally, 3DOP was aiming for €10 million in follow-on investment. By the end of the project, more than €42.5 million had been raised through public funding, private investment and new revenue from 3D-printed products and services. That shows that the project approach worked. Partners brought prototypes closer to market, secured new funding and developed new partnerships.

At least two products were launched during the course of the project. In addition, dozens of demonstration models and prototypes were developed, including in the fields of smart lighting, dental automation, remanufactured metal parts and automated quality control. 3DOP thus demonstrates that innovation only truly delivers value when technology, market access and collaboration come together.

Read the impact assessment

Discover the impact 3DOP has had on investment, innovation, and market adoption.

Read more

The key lessons from 3DOP

The final brochure makes it clear that 3D printing is making great strides towards industrial application. Nevertheless, there are still some issues. Technically, challenges remain relating to material adhesion, process stability, inspection and speed. The technology still needs to be further refined, particularly when dealing with high volumes.

The transition from pilot line to 24/7 production also remains a significant challenge: a demonstration model in a test environment is not the same as a robust production line on the shop floor. In addition, scaling up requires improved digital workflows. Design data, print data, post-processing and quality control need to be more closely integrated. Without a digital chain, automation remains limited.

Finally, market acceptance plays a major role. New 3D printing solutions are still often assessed on a per-unit basis. As a result, the broader value is sometimes overlooked: reduced downtime, less material waste, local production and shorter lead times, for example.

A springboard for new projects

3DOP has been completed, but the project isn't really over. The brochure describes the project as a springboard for further collaboration. The knowledge, demonstration models and contacts gained remain valuable to the partners. They form the basis for new projects, industrial applications and continuing market introduction. The European I3 instrument also plays a role here. This programme supports interregional innovation projects that help scale up and commercialise technology.

3DOP demonstrates what can be achieved with such an approach. Bringing together regions, businesses and research institutions enables more to be achieved than if each partner were to work independently. That is an important lesson for businesses. 3D printing isn't growing because of a single breakthrough. Technology only truly advances when materials, machinery, software, automation, financing and market knowledge are developed in tandem.

What Can Companies Learn from 3DOP?

Would you like to know exactly what results 3DOP delivered? The final brochure summarises the entire process, the key demonstration models and the lessons for companies wishing to make further use of additive manufacturing.

You will discover how European partners worked on metal printing, smart moulds, embedded electronics, dental automation and automated post-production.

The brochure focuses on how 3D printing is moving closer to industrial-scale production. Not as a standalone technology, but as part of a broader manufacturing ecosystem.

Download the brochure Download the Impact Report

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