

BLACKBELT

Prototyping & New Business



User Case – Profielnorm

With the Blackbelt 3D printer, Profielnorm introduced a new concept for solving production problems and discovered numerous process improvement possibilities through 3D printing. This article explains how, with the help of the unique features (printing long prints, serial 24/7 printing, and printing with minimal support), the unprecedented possibilities of our Blackbelt 3D printer, prototyping, innovations and new business development are implemented and further developed at Profielnorm.

About Profielnorm

Profielnorm is a leading European manufacturer of mezzanine floors¹ and cold-roll-formed steel profiles. Profielnorm designs, manufactures and installs these floors. The company distinguishes itself through custom solutions and an up-to-date, certified production process.

They offer personal advice & design to professional installation, Profielnorm provides the mezzanine floor required by the customer. Thanks to an extensive engineering department, Profielnorm has the know-how for a professional and sustainable realization of the projects.

Their solutions include:

- The more effective design of spaces.
- Floors, stairs and railings and means for pallet storage

Profielnorm delivers a total concept from a custom calculated design, to assembly.



Mezzanine floor with stairs

Profielnorm is a Dutch company, located in Tholen (NL) in Zeeland. The company has a global customer network. In addition, Profielnorm is working on setting up 2 more divisions in Poland and England.

Blackbelt-3D Use Case at Profielnorm

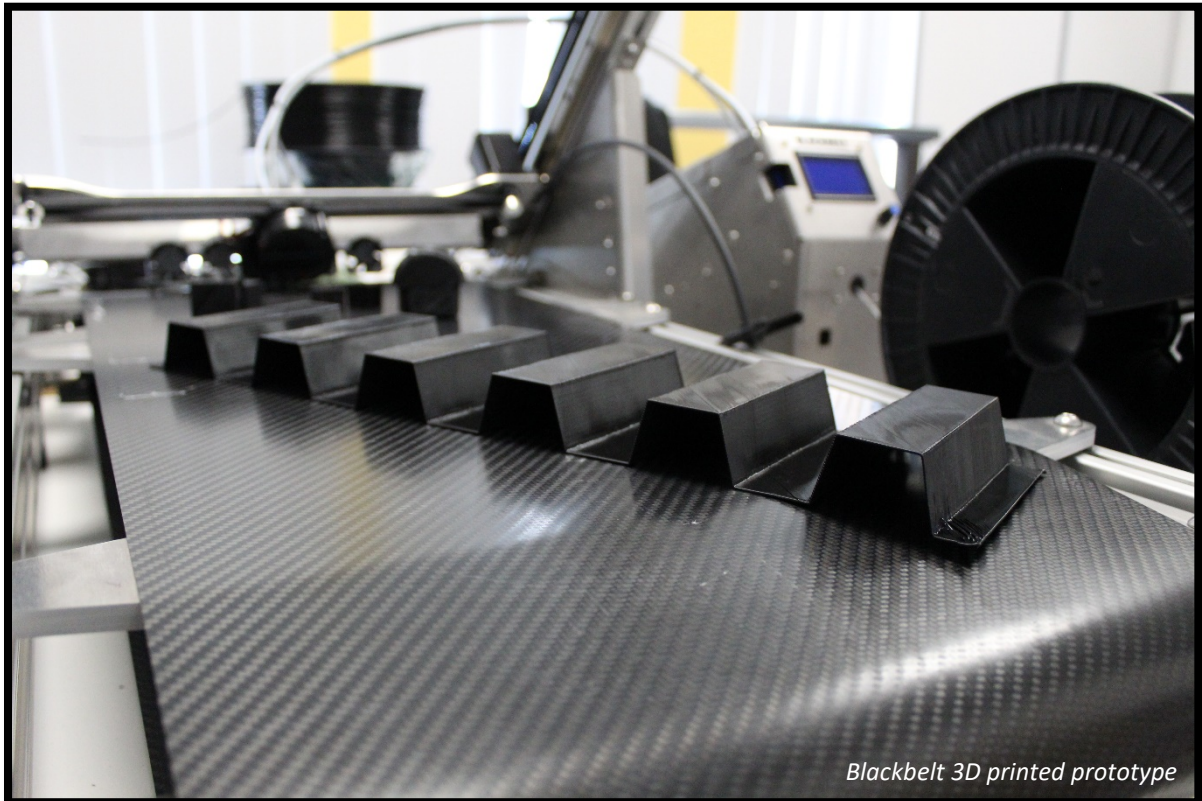
At Profielnorm's production site in Tholen, the Netherlands, they have engineers with extensive experience in 3D printing. The company owns a Blackbelt 3D printer for 3 years and gained the necessary experience during that time (Most of the time they use Ngen and PLA filament, but are looking for biobased alternatives). In 2017, the management of Profielnorm took the decision to invest

¹ A **mezzanine** floor is a self-supporting construction that is built between two floors. Mezzanine floors are also known as mezzanines, mezzanine floors or system floors.

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in an initiative to try out new and innovative ways for prototyping, visual product innovations and new business development.

A technical team has built up 3D competencies and has proven to management that 3D technology is of added value to realize product innovations and prototypes.



At the location in Tholen, a wide range of machines is available, about 20+ machines on a floor area of 4.800m², the production of metal profiles is their core business. They use the roll forming lines to make the load bearing profiles, which provide the strength of the floors.

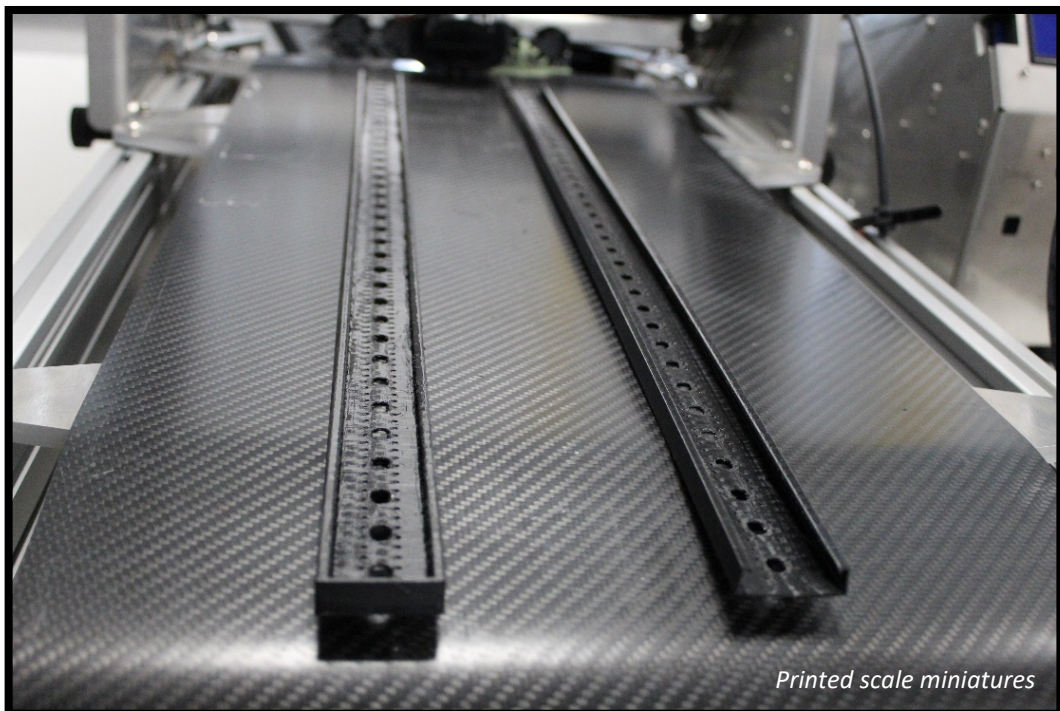
Profilnorm has a modern and complete factory that produces and assembles the various elements of the mezzanine floor, in order to be able to deliver those elements as a "tailer made kit" to the construction site.

The roll forming machines, on which profiles are punched, formed and cut, are the centerpieces of production. Sawing lines, welding robots and an automatic drilling line take care of the manufacture of the columns, stairs and railing.

Thanks to the use of a Blackbelt, Profilnorm is able to implement minor changes to the steel profiles and constructions. With the help of scale minatures (1:10), complete floors and floor parts are printed, in order to get tangible where product improvements can be made. For these long parts Blackbelt is the perfect tool.

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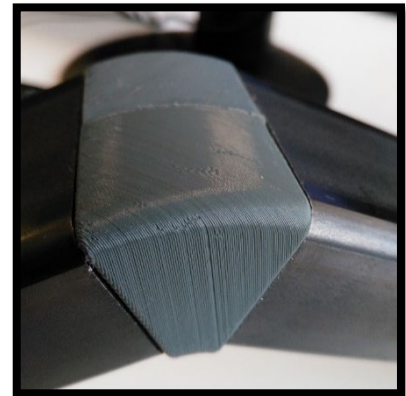
The in-house 3D print printer was added to the company's toolset to address issues with molds and fixtures. Profielnorm chose the Blackbelt 3D printer because it differs from the other FDM 3D printers. The unique advantages of long prints, 24/7 serial printing with minimal support give the technicians and engineers of Profielnorm more flexibility and unprecedented possibilities.



" Through trial and error, we learned to look for improvement "

Key Findings #1 Trail and Error

Learning to work efficient with the Blackbelt platform requires some adaptability, even if you have worked with 3D printers before. Printing under a 45 ° angle has a unique signature and influence on the slicing settings. You soon find out that precisely because of that angle the possibilities with a Blackbelt are really limitless.



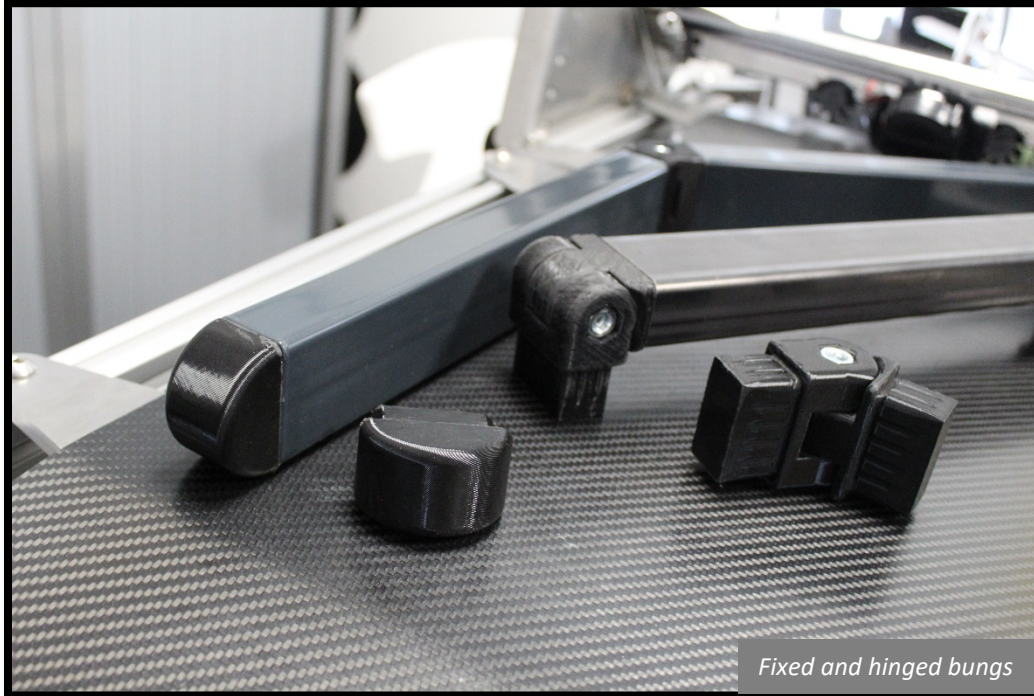
Key Findings #2 Serial production

With the Blackbelt 3D platform Profielnorm can produce in series, the organization set up its own production line for stoppers, or bungs. A stair comes with handrails, at the end of the rails there are openings. You can finish it off with a closing bung, or connect them with a hinged version. This results in a customizable railing system. Previously, the realization of bungs was outsourced to external parties, which considerably increased costs and time to market (cost saving of about € 10.000 per injection mold).

After good research they set up the serie production line for bungs on the Blackbelt. In the beginning, there were some challenges, especially in finding the correct printer settings. After about 4 weeks, the machine was running at full capacity, with a bung rolling out of the machine every hour (24/7).



Serial production on a Blackbelt



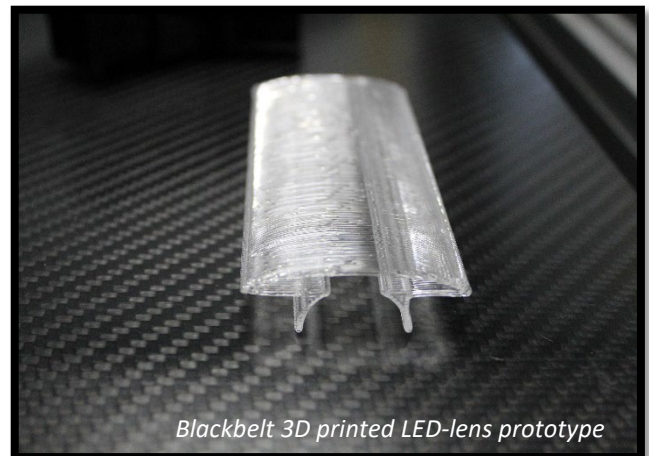
Fixed and hinged bungs

Findings #3 New Business

The knowledge gained with the Blackbelt gave Profielnorm the opportunity to look further at innovations and discover new business opportunities.

For example, the organization has scaled scaffolding of the mezzanine floors made to find visual product improvements. In addition, the organization uses prototypes to make new ideas tangible. For example, the printer contributed to the development of a built-in LED lens system, incorporated into the banister.

Finally, Profielnorm wants to profile itself as a sustainable organization, with an eye for people and the environment. The company wants to be an example in society in terms of sustainability. Profile Standard embraces and explores the possibilities of printing with biodegradable plastics.



Blackbelt 3D printed LED-lens prototype

Conclusion

The original goal of the management to run an independent series production of bungs has been more than achieved. Along the way, Profielnorm discovered more and more unique applications and functions for the Blackbelt 3D platform.

The biggest advantage of in-house 3D printing is that the organization became independent of suppliers and mold makers. Profielnorm is able to develop and adapt its own products and is very flexible in terms of color and quantity of the needs.

The Blackbelt 3D printer and its many applications have become a valuable addition to the innovations of Profielnorm. Technical personnel are rightly proud of these 3D capabilities.

Key Takeaways

- Profielnorm employees are proud of their 3D discoveries
- Inhouse serial production for printing bungs is achieved
- Continuous to discover more about sustainable printing
- Prototyping made tangible
- Inhouse printing saves time and resources

