



Changing perceptions

Sustainability by using sand

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Additive manufacturing is one of the sustainability topics within industry. Apart from plastics, 3D printing is also possible with natural raw materials such as sand. Sandhelden produces customized products made of quartz sand using a patented 3D printing process. In terms of energy and raw material efficiency, 3D printing with sand distinguishes ceramics, porcelain and aluminium, for example. In contrast to other processes (additive and non-additive), no melting temperatures are required, which also means lower electricity consumption.

In 2015, the UN member states adopted 17 Sustainable Development Goals to make our planet a better place for life by 2030. Sandhelden focuses in particular on the following goals:



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.



12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Ensure sustainable consumption and production patterns.



13 CLIMATE ACTION
Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.

Raw material and production - a local solution

Sustainability begins with the raw material quartz sand, which is mined directly in Bavaria. Together with a Bavarian plant manufacturer, customized products are created in the same region. This reduces transport distances and the related greenhouse gas emissions. Post-production, such as hardening and coating, is also handled locally. Thus, products from Sandhelden are 100% "Made in Bavaria".

Sustainability is also playing an even more important role with regard to binders, for example by using inorganic binders.

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Nearly waste-free production

Customized production allows individual needs and precisely fitting requirements to be fulfilled. The process is optimized in such a way that waste is also minimized. The sand which is not used in the printing process can be recycled up to 8 times in production. A requirement for the recycling process is that the sand has not been printed - in other words, it has not been in contact with a binder.

In addition, after the eighth reuse, the recycled sand can be prepared and cleaned so it is suitable for production again.

Products with a high waste rate in their traditional production can therefore be produced more resource-efficiently.

Moreover, additive manufacturing means that no toolmaking is required. As a result, the consumption of raw materials and energy is reduced once again. In addition, production errors caused by toolmaking can be completely avoided.

Saving of resources

Every year Sandhelden saves huge amounts of valuable primary resources through innovative environmental technologies and extensive recycling activities. This is equal to 11 apple trees and 680 kg of greenhouse gas emissions.

Working on research activities

Sandhelden is currently testing 3D printing with recycled plastic. With the innovation voucher from the state of Bavaria ("Innovationsgutschein"), a first feasibility study on the use of microplastics in additive manufacturing was commissioned at the Fraunhofer Institute.

„The cooperation with the Fraunhofer Institute (IGCV) was extremely goal-oriented. It was a very interesting exchange of knowledge during the whole project for both parties. We have built up a lot of knowledge in this project, especially in the technical area and with regard to the materiality.“

Laurens Faure, CEO of Sandhelden

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In contrast to conventional 3D printing with plastic, printing with microplastics from the sea differs not only in the fact that the raw material is recycled, but also in the way the printing material is used - in powder form instead of a paste. Unlike the established FDM process, the plastic is not made elastic and injected, but is applied and bonded layer by layer. The next step will therefore be to realize the production using microplastics. For this purpose, the plastic must still be converted into a suitable powder form to make it printable.

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