

Innovative bio-based 3D printing

Additive manufacturing or 3D printing is increasingly becoming an important part of innovation processes, but is normally based on plastic material. In Sweden, northern Värmland region, the open test bed Circlab is using 3D machines printing in wood-based biocomposites. Circlab has built a one of a kind machine park for rapidly developing prototypes and products using 3D technology. One of the world's largest 3D printers is used for printing in large scale – for example kayaks and other big parts. Smaller printers are also used for various needs, along with equipment for developing new bio-based materials, processing wood, and working with lamination and other post-processing. Circlab is a strategic investment that is at the forefront of meeting future industry developments in biocomposite and forest bioeconomy.

The method of 3D printing is to build up the desired shape layer by layer, which is perfect for fluid, complex forms. That is why, for example, boat industry and the outdoor sector are frequent visitors to the test environment. However, machine prototypes, design furniture, heels, hot tubs, displays, signs, and much more are also printed here.

One biocomposite used in printing is a mixture of bioplastic and wood fibers leftover from the production at local sawmills. It is a strong and recyclable material that helps reducing the amount of fossil raw materials in various products. When the product is no longer in use, it can be ground down and become new composite material and reused for a new design. It can hardly get more circular than that.



“I have developed a wood composite consisting of spruce wood attacked by spruce bark beetles, a resource that was previously considered unusable. The 3D printer provides possibilities in terms of shape, as can see on my furniture, which is basically impossible to create in other ways”, says Simon Mattisson, guest furniture designer.

Since its start in 2016, Circlab has functioned as an open innovation environment where ideas are tested practically to potentially become commercial products. The operation is run as a collaborative project involving, among others, Paper Province, IUC Dalarna and Dalarna Science Park with funding from Torsby municipality, Region Värmland, Region Dalarna and the Swedish Agency for Economic and Regional Growth.