



Romain van Wassenhove with the new connector | Photo source [Alain Herzog / EPFL 2021](#)

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3D-PRINTED CONNECTOR TO AID IN BUILDING SUSTAINABLE STRUCTURES

 ARCHITECTURE & DESIGN

A small 3D-printed connector that was developed for use in building sustainable structures

Spotted: Sometimes, the smallest things can make a big difference. This seems to be the case with a small 3D-printed connector that was developed for use in building sustainable structures. The connector was designed by Master's student Romain van Wassenhove, a civil engineering student at Ecole Polytechnique Federale de Lausanne (EPFL).

Van Wassenhove's initial project was to design a connector that could be used to make modular structures out of sustainable bamboo rather than less sustainable materials such as wood, plastic or metal. After receiving his degree, van Wassenhove received funding through an EPLF incubator programme to test his connector on an initial application involving bamboo structures.

At the same time, van Wassenhove created an online programme that allowed users to design their own modular bamboo furniture or structures, to be assembled with the help of his connector. After users design their furniture, van Wassenhove sends the files for cutting the bamboo sections and for printing the connectors to a manufacturer located close to the customer – saving further energy.

Bamboo is highly sustainable — it grows quickly and can fix more CO₂ than trees, while its mechanical properties, combined with van Wassenhove's connectors, make it quite sturdy. However, while the system offers a number of advantages over other materials, in Europe bamboo is still seen as, “poor man's wood, associated with patio furniture, exotic vacations and eco-friendly lifestyles,” [according to](#) van Wassenhove. He also points out that Europe lacks the manufacturing know-how to cut bamboo properly.

3D printing and the use of alternative materials are becoming an increasingly important approach to sustainable design construction. At Springwise, we have seen this development in recent innovations such as a lightweight [space frame](#) made from 3D-printed components and bio-concrete made from weeds and seashells.

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Takeaway:

Van Wassenhove's goal is to, "bring bamboo to European industry, as part of the transition to a more sustainable economy." In fact, the bamboo structures could be used in a variety of applications, such as creating temporary, bespoke structures and furniture for conventions and using concrete-filled bamboo stems as structural elements in more permanent structures. On top of this, it appears that the connectors may also be heading into space. Students at French civil aviation college Ecole Nationale de l'Aviation Civile are using the connectors to develop a meteorological tower made from composite materials, for use on space missions.