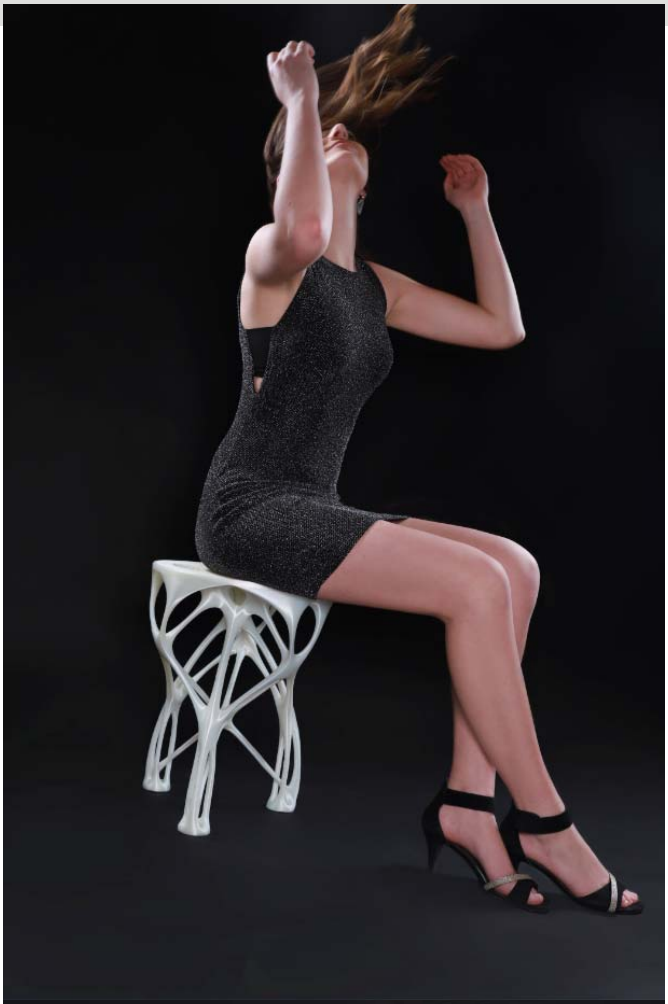
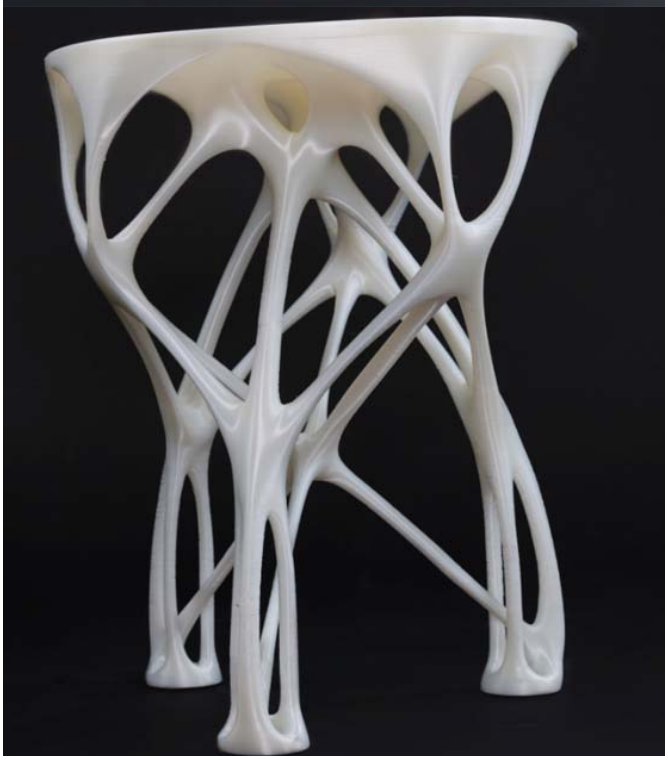
BIONIC INSPIRED STOOL PRINTED IN ZYTEL®

LARGEST PART PRINTED WITH ZYTEL® 3D FILAMENTS TAKES THE LOAD





Key Features

- strength
- stiffness
- easy FLM printing
- surface esthetics

Key Benefits

- functionality, holding a person
- support structure free printing
- no painting

New design concepts for functionality

3D printing slashes the traditional design principles as typically applied for plastic components. No restrictions for wallthickness, undercuts or clamping force considerations, just a few for overhangs or infills, which in sum allows a bionic inspired design approach.

Traditionally plastic engineers believe in constant wallthickness and ribs to reinforce a component, how can they trust a “bionic” design?

The answer had to be given with a real and functional demo part, as trivial as a stool.

With nearly no constraints in mind, a DuPont CAE expert designed a stool inspired by bionic and to some extend Gaudis architectural principles. There was though one constraint: maximum overhang angle of 45 degrees, so to allow support structure free additive manufacturing with FLM. Structural analysis was perfomed to make sure that it would hold a person, and never a topological optimization has been so easy to implement, as wall thickness variations are not a production concern.

The stool was finally produced with a wallthickness of 5mm and a low double digit infill on the X1000 model of German RepRap within 60 hours and for the size of the item a relatively small layer height, beneficial for the surface esthetics of this demonstrator, which can defintily not be manufactured in any of the traditional plastic processing methods

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