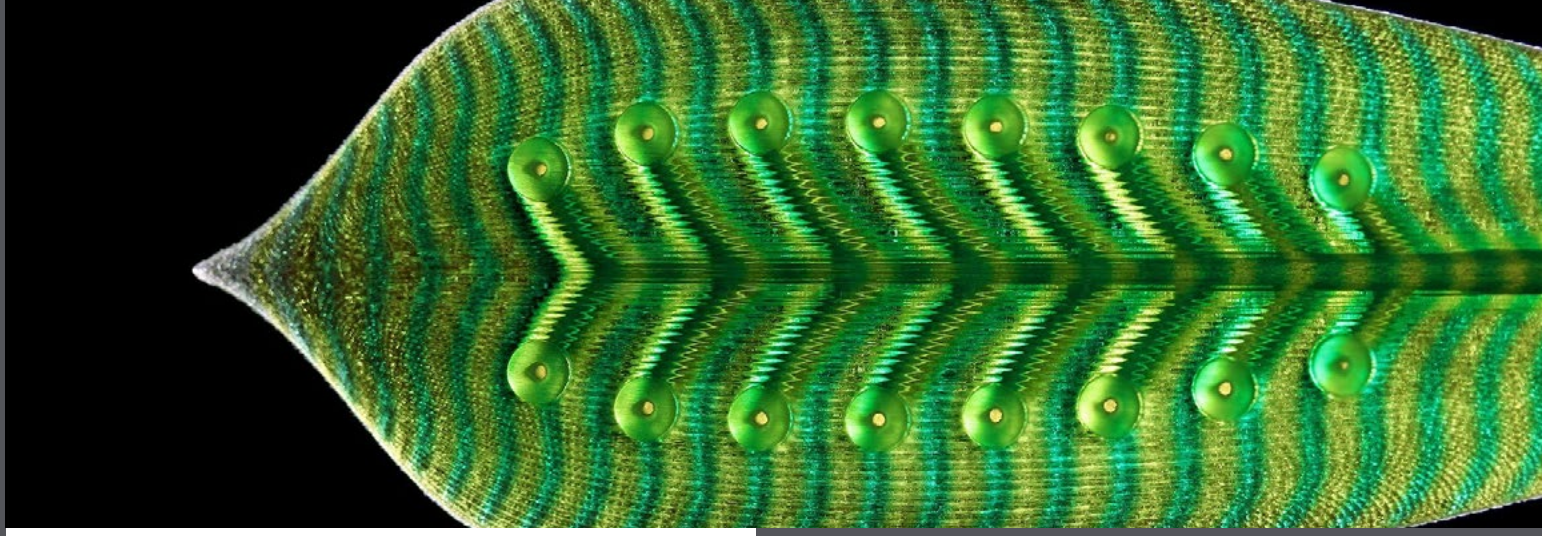


Victoria University of Wellington Case Study

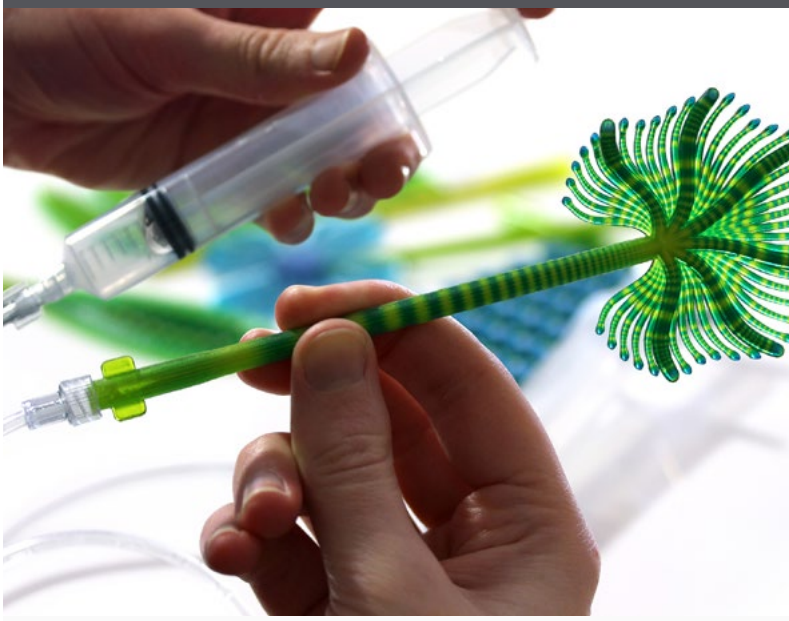
Expanding 3D printing technology to create 4D liquid printed structures that imitate living organisms. .

Before Stratasys' PolyJet™ technology arrived on the scene in 2004, designing and prototyping processes were long and laborious. PolyJet printing capabilities made it possible to create highly detailed full color 3D printed prototypes quickly and easily. The subsequent introduction of the Stratasys PolyJet Research Package became a game changer for Ross Stevens, Senior Lecturer for Industrial Design and Co-Founder of MADE (Multi-property Additive-manufacturing Design Experiments) at the Victoria University of Wellington in New Zealand. MADE educates in the use of 3D printing and provides an opportunity for students to learn about additive manufacturing, and its potential to change the way products are designed and manufactured. The program allows students to gain hands-on experience using 3D printers, and to learn about the latest advances in additive manufacturing technology providing students with the skills and knowledge for a future at the forefront of this exciting industry.

stratasys

> "PolyJet basically extracts every minute detail from the computer and the PolyJet Research Package added the additional capabilities needed to literally take us to a fourth dimension."

Ross Stevens
Senior Lecturer for Industrial Design and Founder of MADE



Polyphytes project 2022 - Clearing Channels with Liquid Print

Case Study

Ross Stevens has used Stratasys 3D printers for his research into emerging digital technologies, specifically 3D printing, for many years, even prior to the release of PolyJet technology. “PolyJet allowed objects to be made on a voxel scale.” said Ross, “You may have an incredible digital image but as you extract it to print, most other technologies fall short. They can give you shape but not all its colors and translucency and you absolutely can’t get movement with anything other than PolyJet which basically extracts every minute detail from the computer. PolyJet Research Package has added the additional capabilities needed to literally take us into a fourth dimension.”

The Stratasys PolyJet Research Package is an advanced software tool that is capable of delivering infinite flexibility when printing prototypes, unlocking a level of accuracy that was never before attainable. With an advanced set of tools at their fingertips, researchers can create prototypes with unprecedented features and functionalities. One such impressive feature is Liquid Print, which enables the printing of liquid materials in soft parts, hydraulics and fluidic models - allowing project researchers to create life-like prototypes of living organisms.

Stratasys PolyJet Research Package was the fundamental shift that led the way to the liquid print research undertaken by Ross Stevens and Nicole Hone called Polyphytes. The Polyphtes utilize liquid print to create fluidic models that perform like vascular systems in plants. “The project demonstrates the dynamic qualities of 4D printing by creating 3D prints that can function and change their aesthetic as various mediums flow through their internal channels; water, air, smoke, icing sugar, bubble mixture and soap.” Nicole explained, “The designs are procedurally modelled to create intricate, organic textures and coloring. This takes advantage of the J850’s ability to print high resolution on a microscopic scale. The physical effects seen in the film evoke the beauty of natural pollination and the transportation of nutrients in plant life.”

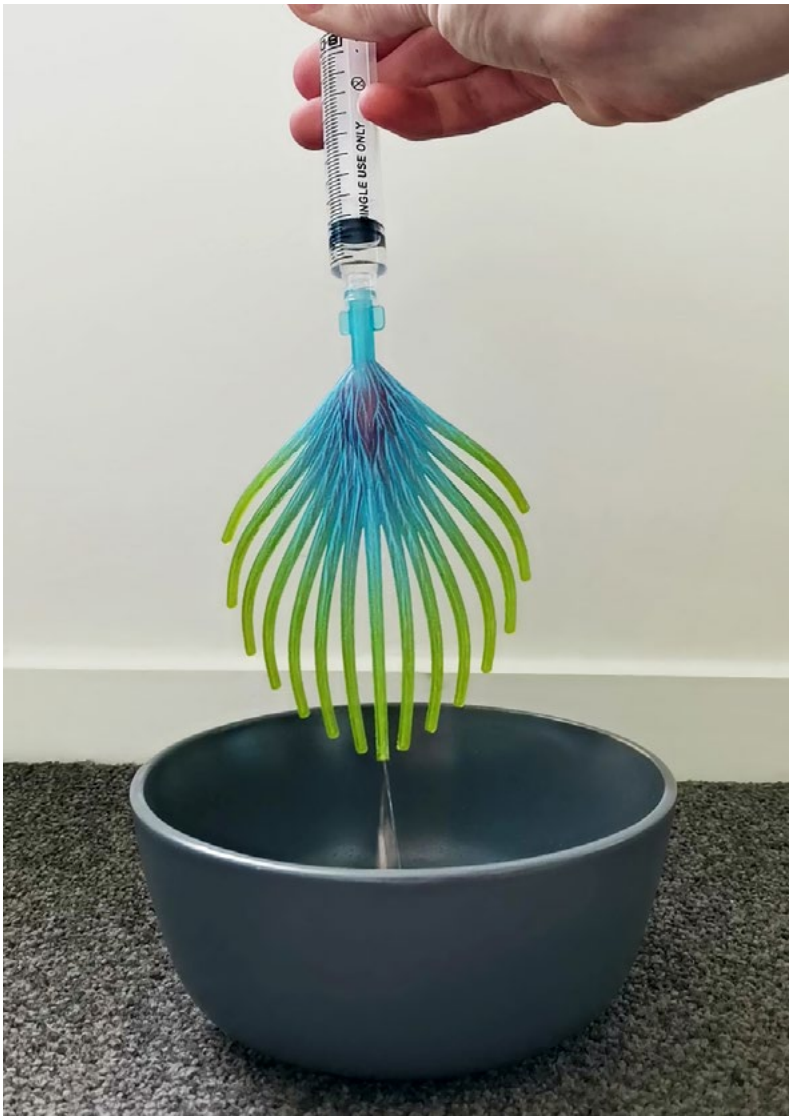
“

With the Research Package, I can print with rigid materials and still have clear channels inside, we have finally reached a stage where you can have color and flexibility at the same time.

Nicole Hone

Industrial Designer and MADE Alumni

Polyphytes project 2022 - Flushing Out Liquid Support



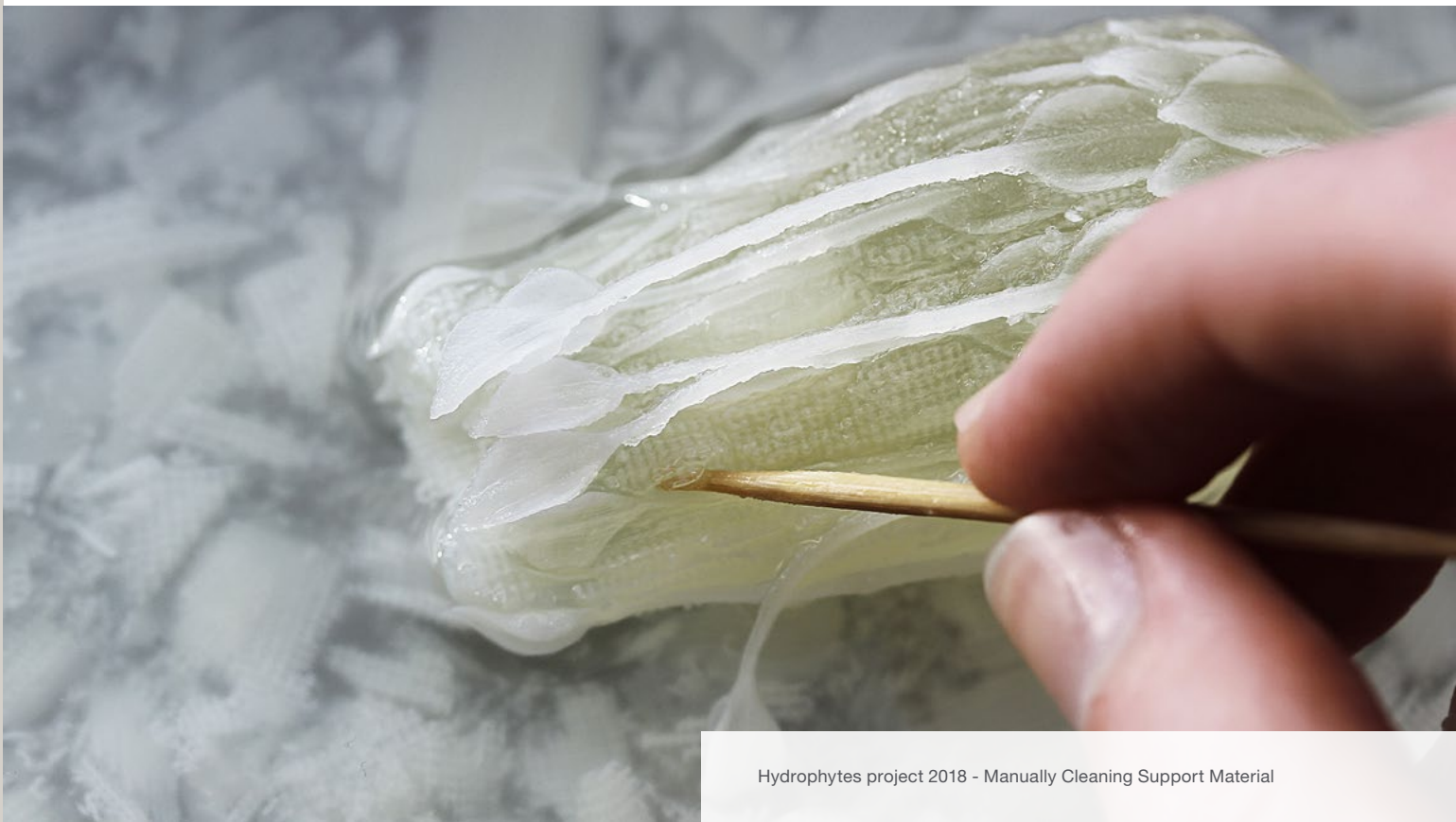
Internal channels with small diameters for intricate, vivid results that could not be reached with any other technology.

The Polyphytes were designed with intricacy and precision, utilizing internal channels with small diameters to render stunning effects. The Stratasys J850 Prime 3D printer brought these visions to life in full-color rigid photopolymer resin with varying levels of opacity for maximum impact. The PolyJet liquid serves as support material in the internal channels, temporarily filling the voids until drained out on post-production. This allows the channels to become seamlessly free flowing for vivid results.

“For our previous Hydrophytes project, before the research package became available, we had to spend hours manually removing support material from the channels and almost always were unable to remove it completely.” Nicole explained, “With the Research Package, I can print with hard materials and still have clear channels inside. I think the J850 Prime is really cool, we have finally reached a stage where you can have color and flexibility at the same time.”

Stratasys software, printers, and liquid support material enable printing more minor, more reliable, and intricate internal tubes directly into the object. The Liquid Print feature of PolyJet technology allows the creation of these airtight cavities filled with liquid inside an object. This technology has exciting potential for many applications and promises to revolutionize the way we think about manufacturing by bringing complex structures directly from the design environment into reality.

Click here to see just how Stratasys’s 3D printing technology was integral to this project.



Hydrophytes project 2018 - Manually Cleaning Support Material

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