

Architecture, Engineering & Construction

# Creating a **sustainable model** for architectural fabrication

Aectual

Aectual uses Lenovo ThinkStation solutions to design and manufacture bespoke architectural objects from recycled materials, helping to reduce carbon emissions and build a more sustainable future.



Lenovo

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## Who is Aectual?

The architecture, engineering, and construction (AEC) industry is responsible for almost 40% of global carbon emissions and around 30% of all the world's waste. Harnessing the circular economy and reusing materials offers an effective solution to these environmental challenges, and visionary Dutch design-to-manufacture firm Aectual is leading the way towards a more sustainable future.

Formed in 2018, the company uses state-of-the-art digital fabrication techniques to form architectural objects from plant-based bioplastics and recycled waste materials. This innovative process enables the creation of highly sculptural designs, and gives clients the opportunity to personalize their interior designs in a way that was rarely possibly using traditional materials.

# Aectual

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## The Challenge

To realize its vision of sustainable design and construction, Aectual developed the world's first platform for creating architectural products from recycled materials on an industrial scale. The hugely powerful technology setup combines sophisticated design algorithms with XL 3D printing devices, capable of producing everything from flooring and furniture to wall panels and lighting systems.

To support these design and production workflows, Aectual requires IT equipment capable of running 3D modeling and simulation programs—and that's where Lenovo comes in.

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“Interiors are typically designed to fit around materials that already exist. We’re trying to flip this, especially as using those materials leads to so much waste. Our goal is to provide the tools and materials to create any kind of interior product, which in turn enables any kind of design.”

**Hedwig Heinsman**

Creative Director & Co-Founder, Aectual

# Powerful workstations for demanding creative work

To deliver the massive computing power needed for its design, development, and production work, Aectual has used Lenovo ThinkStation solutions for many years. Equipped with powerful GPUs and high memory capacity, the Lenovo workstations are ideal for running demanding AEC applications.

Using the Lenovo ThinkStation systems, the Aectual team can work quickly and efficiently, rendering complex parametric 3D models and running complex simulation tasks. Similarly, architectural designers can incorporate feedback from clients and colleagues into designs at high speed and prepare the final files ready for 3D printing—helping to keep projects moving forward at all times.

## Hardware

Lenovo ThinkStation workstations

## Services

Lenovo Asset Recovery Services

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“We really need IT equipment that operates at the highest levels, so we can focus on the most challenging problems. We use Lenovo workstations at every step of our process, from initial design to final production, and we can't wait to see where the future will bring us.”

**Hedwig Heinsman**

Creative Director & Co-Founder, Aectual

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## Results

Working with Lenovo, Aectual has established itself as a world leader in sustainable fabrication, successfully blending eco-friendly, circular principles with artistic, sculptural designs. Among the company's clients are BMW, Nike, Tetra Pak, and Amsterdam Airport Schiphol.

Aectual provides a circular take-back service, meaning that products after use are shredded and re-printed into new items. Aectual estimates that its manufacturing process could reduce materials consumption by 600% over the next 50 years and cut typical carbon emissions during every interior change by up to 80%.

- ✓ Helps reduce construction waste by 600%
- ✓ Cuts carbon emissions by 80% during a design change
- ✓ Enables recycling of materials in a circular loop



## Continuing a flourishing partnership

Aectual's work with Lenovo extends beyond technology into the field of marketing collaboration. For example, [Aectual created a unique booth](#) using 3D-printed materials for the Lenovo workstation team for two industry events: NXT BLD and Autodesk University in 2022. With a design that seems to shift when viewed from different angles, the Lenovo booth showed the aesthetic potential of sustainable materials.

And in 2023, [Aectual took a set of old laptops, servers, and mobile phones](#) and turned them into 3D-printed ottomans for Lenovo Tech World in Austin, Texas. Each ottoman featured a red top to imitate the look of a pointing stick on an early keyboard, and carried text informing attendees they were made from recycled tech.



**“The built environment is fundamental for everyone’s lives, and we want to make it circular, accessible, and flexible. We are proud to be a Lenovo customer. Together, we can work towards a smarter and more sustainable future.”**

**Hedwig Heinsman**

Creative Director & Co-Founder, Aectual



# Why **Lenovo**?

On one level, Aectual chooses Lenovo for the powerful workstations available, equipped with the GPUs and high levels of processor capacity needed for creative design applications.

But more than this, it's a partnership founded on shared values, with both organizations intensely committed to building a better future through sustainability and meaningful innovation. Just as Aectual strives to develop a new eco-friendly architecture, Lenovo pioneers circularity in the tech space through its Asset Recovery Services—a concept that came to the fore when Aectual transformed Lenovo laptops and servers into eye-catching furniture for the Tech World event in Austin in 2023.



# How can companies marry innovation with sustainability?

Using Lenovo ThinkStation solutions, Aectual designs bespoke architectural objects from recycled waste materials and eco-friendly bioplastics.

[Explore Lenovo ThinkStation Solutions](#)