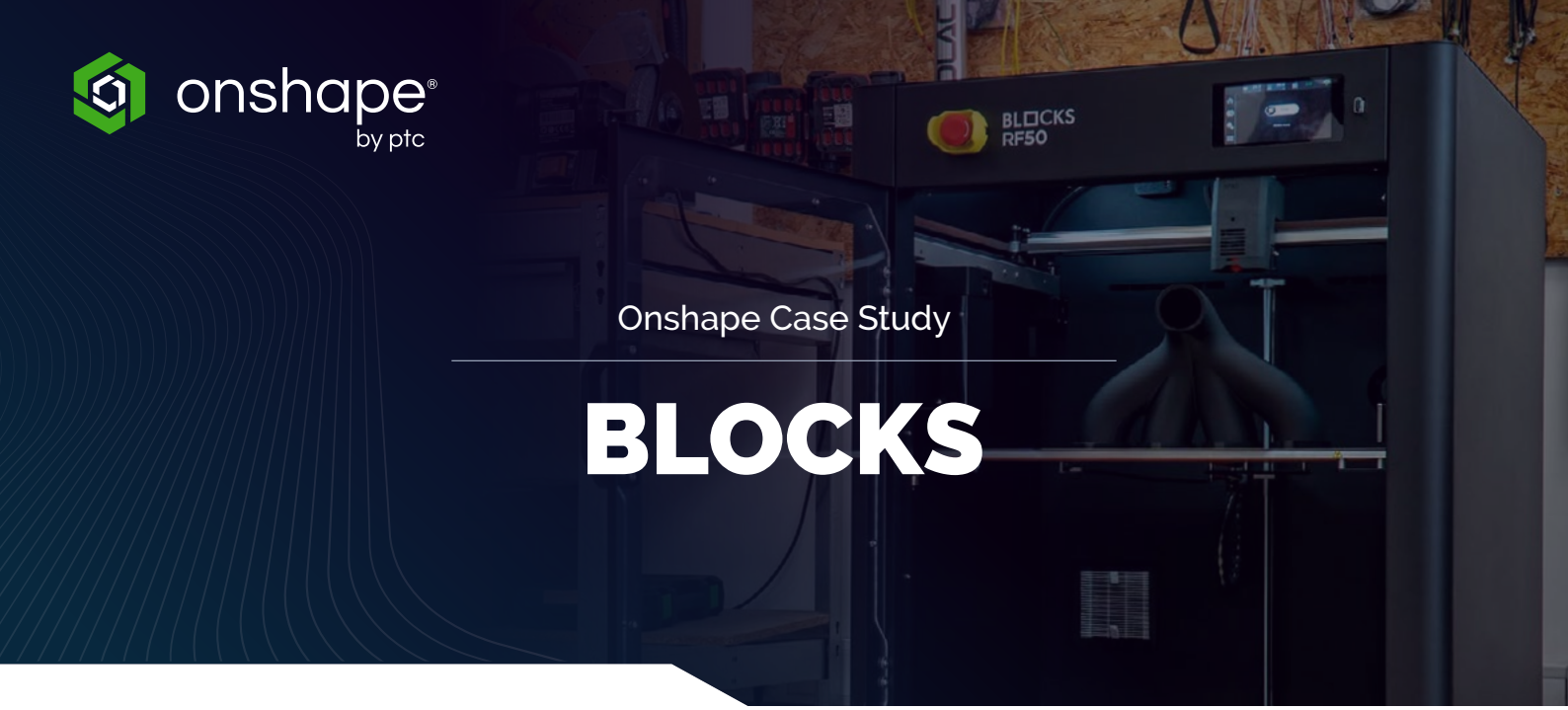
onshape by ptc



Onshape Case Study

BLOCKS

BLOCKS

INDUSTRY: MACHINE DESIGN

The Challenge

As additive manufacturing evolves from a prototyping tool into a core production technology, companies face growing pressure to deliver faster, more reliable, and scalable solutions. Portugal-based Blocks is helping drive that transformation by designing and manufacturing industrial-grade large-format 3D printers built for both professional and production environments.

Founded in the late 2010s, Blocks operates with a lean, multidisciplinary engineering team focused on mechanical systems, electronics, firmware, and industrial design. By maintaining full in-house development and assembly, the company ensures tight control over engineering quality while enabling rapid product iteration.

But competing in the global additive manufacturing market means facing established players with extensive resources and mature product ecosystems. To stay competitive, Blocks needed to move quickly to deliver high-performance machines while maintaining agility, efficiency, and controlling cost.

“Our goal is to make industrial-scale 3D printing more accessible, reliable, and cost-effective,” says Duarte Bragadesto, CEO of Blocks. “We help customers reduce lead times, lower production costs, and bring manufacturing closer to where products are needed.”

As their products grew more complex and collaboration expanded to external manufacturing partners, Blocks began to encounter limitations with their SOLIDWORKS CAD workflows, prompting a shift toward a more modern solution. They chose PTC’s cloud-native Onshape CAD+PDM to help them scale.

Results

- **Achieved 30-40% increase in engineering productivity,**
  saving roughly 4,000 engineering hours and €120,000 annually

- **Saved approximately €50,000**
  on hardware by eliminating high-end workstation requirements and reducing software licensing costs

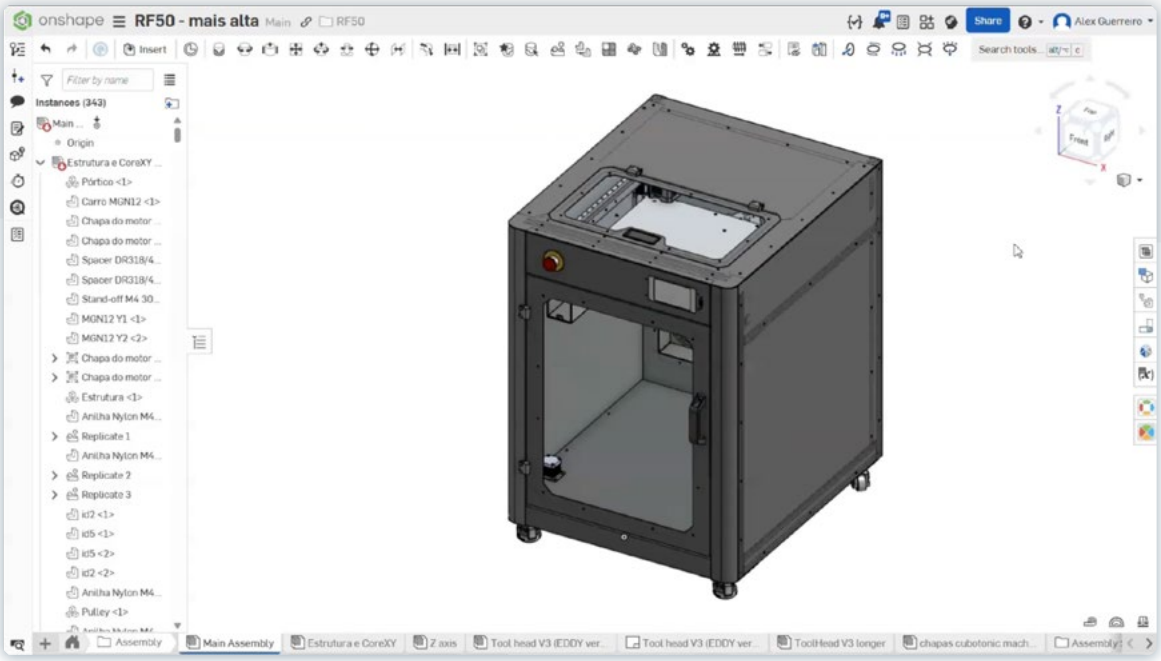
- **Accelerated iteration cycles and time-to-market**
  through real-time collaboration and version control

"What excites us most is proving that a lean engineering team can compete globally by combining strong engineering with modern, cloud-native tools like Onshape."

– **Duarte Bragadesto**, *CEO, Blocks*

Faster Iteration, Lower Costs: How Cloud-Native Onshape Saves Blocks €170,000 Annually While Increasing Engineering Efficiency by 30-40%

The industrial 3D printer company scaled its product development process with Onshape CAD+PDM.



An Onshape assembly of Blocks' RF50 3D printer.

Outgrowing legacy CAD limitations to scale product design

When starting out, Blocks relied on SOLIDWORKS, a familiar choice for a young hardware startup. However, as their assemblies became larger and more intricate, performance bottlenecks and collaboration challenges began to slow development.

Managing large mechanical assemblies, including extrusion modules, structural frames, electronics, and more required significant computing power and introduced slow model load times. Meanwhile, file-based workflows created friction across distributed teams and suppliers.

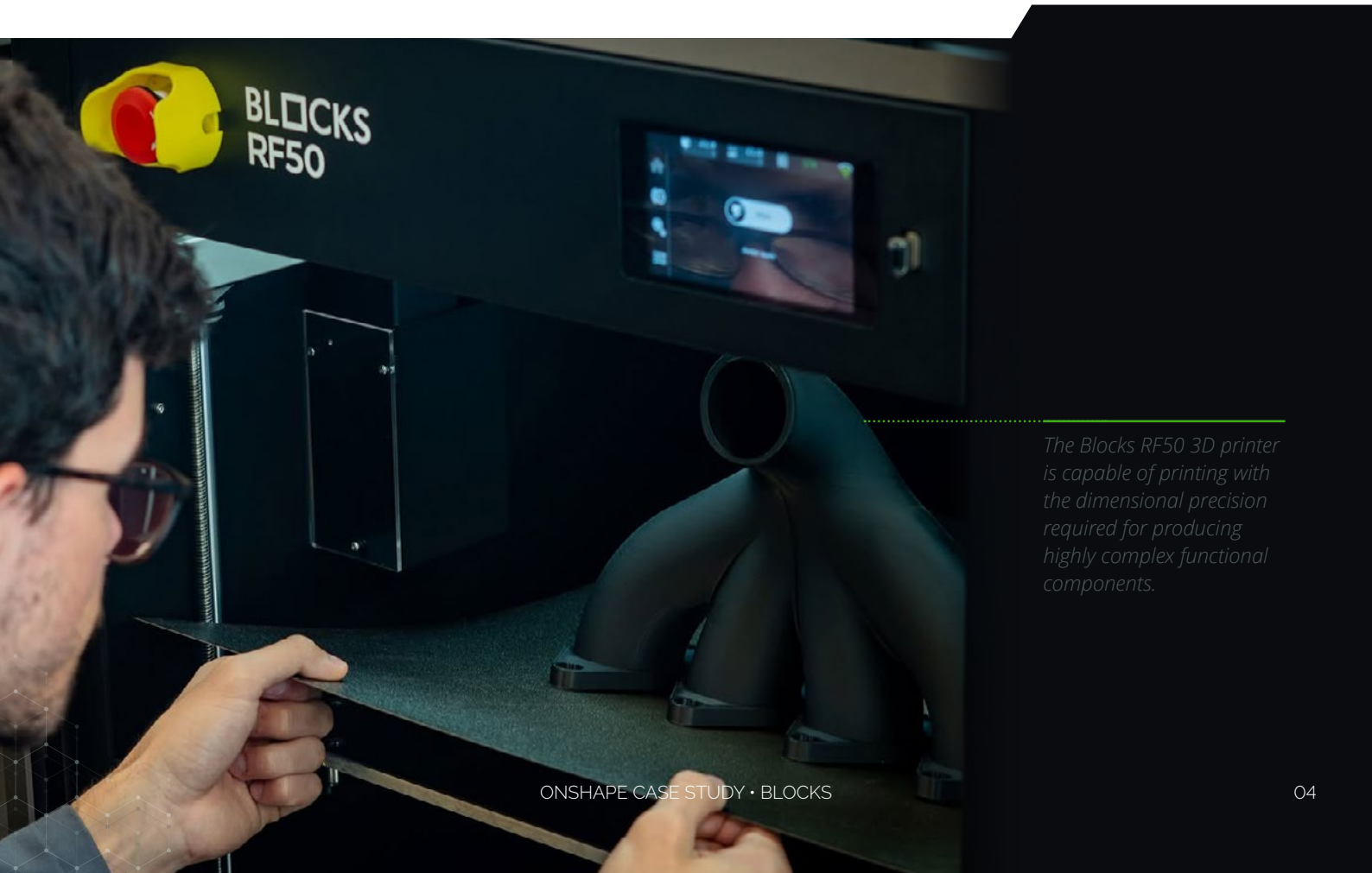
"Working with large assemblies quickly became heavy and slow, especially on standard hardware," Bragadesto explains. "Collaboration was also challenging, as the file-based approach required constant file transfers and manual version control."

Seeking a more flexible and scalable design workflow, Blocks transitioned fully to Onshape's cloud-native CAD and PDM platform. This fundamentally transformed their product-development process.

Increasing engineering productivity by 30–40% with real-time design workflows

Designing industrial-scale 3D printers requires managing highly complex assemblies. Motion systems, extrusion modules, structural components, enclosures, and electronics all have to interact mechanically.

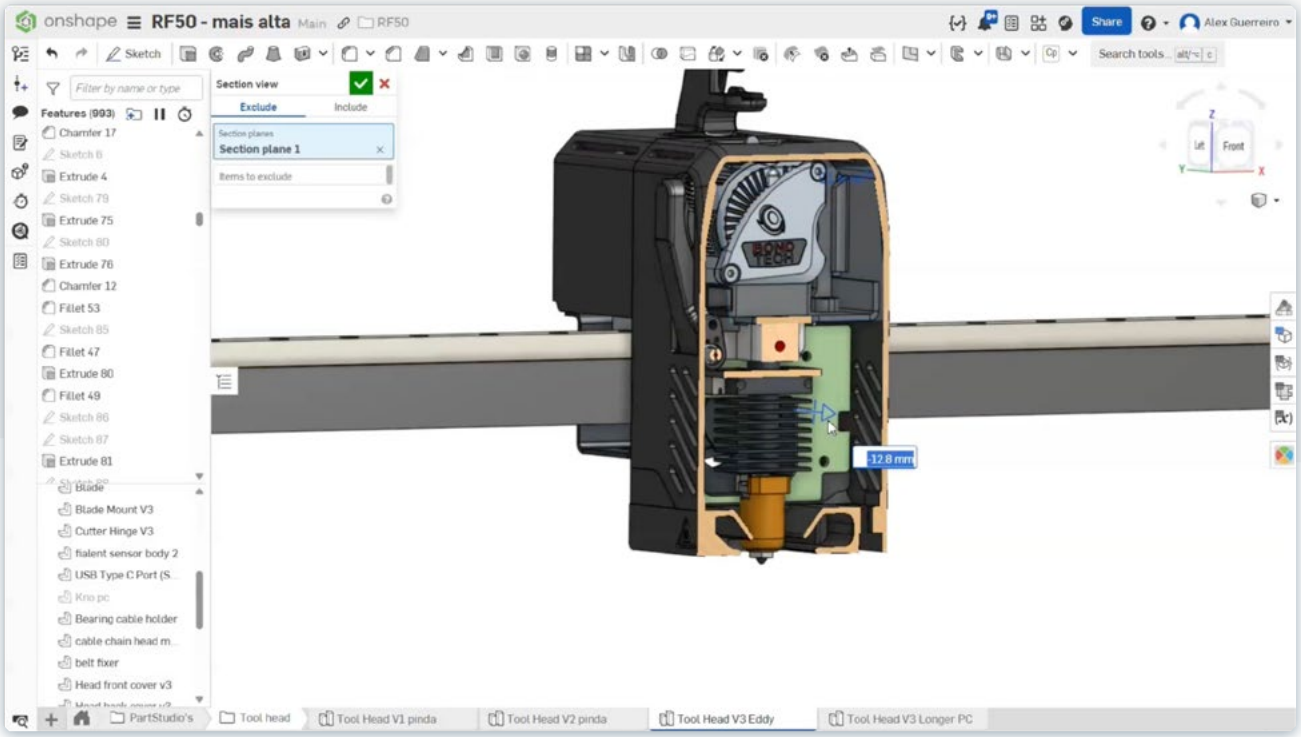
By transitioning to Onshape's cloud-native CAD platform, Blocks enabled their engineers to work within a single design environment where all assemblies are continuously accessible and responsive.



The Blocks RF50 3D printer is capable of printing with the dimensional precision required for producing highly complex functional components.

With Onshape, team members can explore design alternatives through branching and merging capabilities, allowing parallel development of subsystems without disrupting the main design or creating duplicate files. Engineers can validate mechanical interactions directly within all assemblies in real time, ensuring clearances, tolerances, and system integration are continuously verified as designs evolve.

Built-in product data management (PDM) maintains a fully traceable design history, eliminating manual file management and the risk of conflicts or overwritten work. Onshape Simulation supports Blocks' early structural validation, helping identify potential issues before physical prototyping. And Onshape's Surfacing capabilities enable designers to balance functional performance with industrial design requirements.



An Onshape section view of the direct-drive extruder in Blocks' RF50 3D printer.

Together, these capabilities allow Blocks to iterate faster with greater confidence, maintaining design continuity while accelerating decision-making across the product lifecycle.

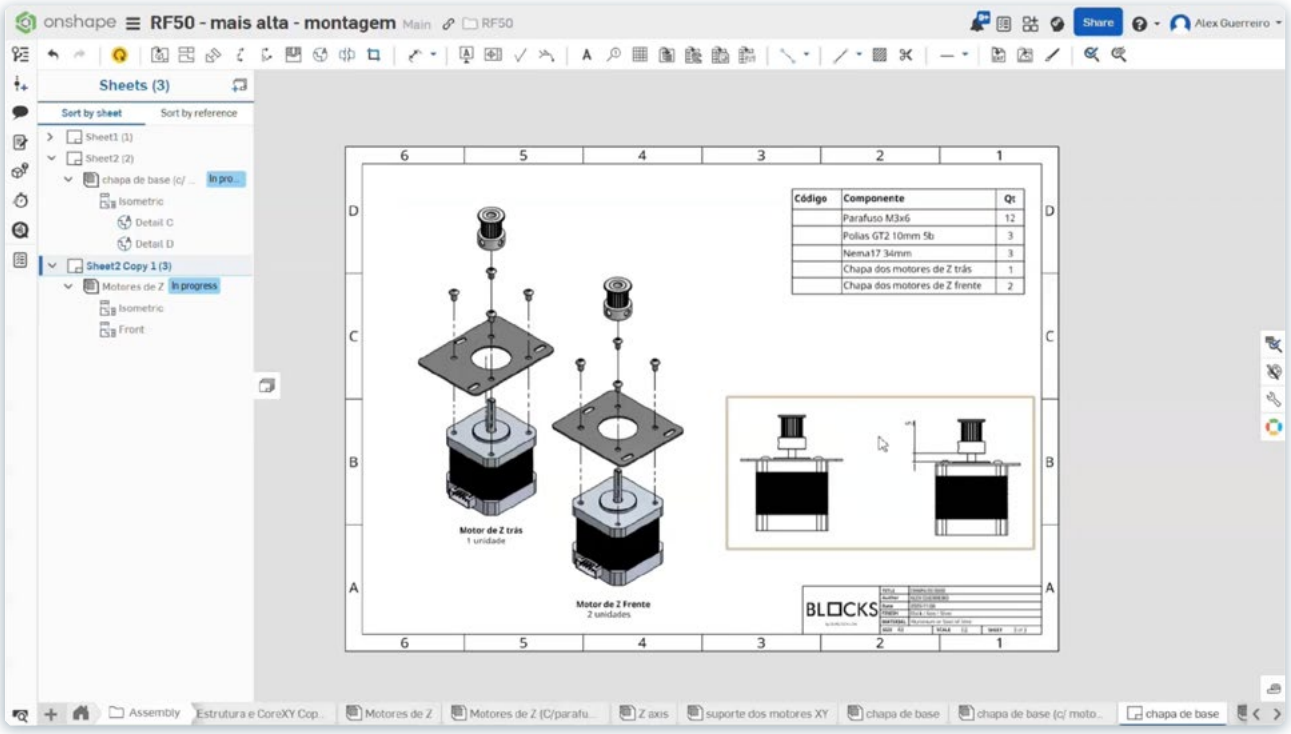
"Design reviews are faster, iterations are safer, and engineers spend more time designing instead of managing files," says Bragadesto.

These workflow improvements result in a productivity increase of **30–40%, equating to roughly 4,000 engineering hours, or €120,000**, saved annually.

Reducing infrastructure costs while scaling engineering operations

Beyond workflow improvements, transitioning to cloud-native Onshape delivered significant operational savings for Blocks.

Running Onshape entirely in the browser eliminates the need for high-end, specialty CAD workstations, allowing engineers to maintain performance using standard laptops, tablets, and even phones. At the same time, moving away from legacy licensing models reduced ongoing software expenditures.



An Onshape drawing and exploded view of the RF50 motors.

Together, these changes save Blocks **approximately €50,000** (with about €25,000 saved from each), enabling a more scalable engineering environment aligned with the company's growth strategy.

"Onshape provides enterprise-level capabilities without enterprise-level complexity or cost," says Bragadesto.

The top hatch of the Blocks RF50 printer offers more simplified access to the mechanical components inside.

Accelerating iteration and time-to-market through global collaboration

As a small engineering team working closely with external suppliers and manufacturing partners, collaboration efficiency is critical for Blocks' development speed. Previously, file-based workflows required manual file transfers and introduced versioning risks that slowed design-for-manufacturing discussions.

With Onshape, internal engineers and external collaborators access the same live design data in real time. This shared source of truth enables faster feedback cycles, clearer communication, and immediate validation of design changes, reducing delays between engineering and production.

These faster development cycles help Blocks respond more quickly to evolving product needs. In the fast-paced additive manufacturing industry, speed, engineering efficiency, and the ability to adapt quickly to customer needs are critical differentiators. Onshape enables them to scale designs to meet these market demands.

"What excites us most is proving that a lean engineering team can compete globally by combining strong engineering with modern, cloud-native tools like Onshape," says Bragadesto.

With faster iteration cycles, improved collaboration across partners, and a more scalable design infrastructure, Blocks is positioned to expand its product portfolio and bring new industrial 3D printing solutions to market faster.

A top view of Blocks' RF50 3D printer, designed in Onshape