



Solutions Guide
Visual Prototyping

Hyper-Realistic Visual Prototypes

Vision Possible





Why 3D Print your Prototypes

Imagine bringing your ideas to life just as you pictured them, vibrant and detailed. That's the promise of visual prototyping with 3D printing.

We get it - creating prototypes that truly capture the essence of your design can be a real headache. Maybe you've struggled with prototypes that just don't look right, take ages to come together, cost a small fortune, or can't quite handle the complexity of your ideas. Sound familiar?

3D printing technologies are turning all those challenges on their head. Experience ultra-high fidelity and precision that hits the mark every time. When it's vital to stand out in a busy market, 3D printing is fast and cost-effective, granting you the agility to iterate and refine your designs quickly.

Say goodbye to those endless waits and eye-watering costs – 3D printing is a game-changer for designers, smoothing the path from the first spark of an idea to a market-ready prototype.



Stages of Visual Prototyping

Concept Design:

At this initial stage, it's all about bringing the first drafts to life, assessing the visual appeal and making key decisions on materials and colors.

Detailed Design:

Here, prototypes undergo a refining process, with a focus on precise color matching, texture emulation, and surface finish to mirror the intended end product.

CMF Design:

This final touch brings together color, material, and finish in high fidelity, ensuring the prototype embodies the desired product aesthetics exactly.



Types of Visual Prototypes

Single Material Models:

Ideal for conceptualizing different forms and shapes, these models are pivotal in the initial design phases to assess structure and ergonomics.

Multi-Material and Color Models:

These iterations are instrumental in advancing design and functionality, allowing for a thorough exploration of the product's potential.

High-Fidelity Models:

The closest representation to the final product, these prototypes accurately simulate the color, textures, and CMF, bridging the gap between prototype and market-ready product.

Look How Far We've Come

There's a range of 3D printing technologies out there, and you'll be surprised at how far 3D printing has come in terms of realism, textures, and quality! It's now the design tool-of-choice for creators in diverse industries.

PolyJet™ shines with its full-color palette and multi-material finesse, perfect for when a prototype's appearance is just as crucial as its function.

Stereolithography steps up for large-scale parts, offering a flawless surface finish that's ideal for high-end, detailed prototypes. While the ease-of-use and range of materials for **FDM®** make it a reliable, cost-efficient choice for designing durable, functional parts.

Each technology brings its strengths to the table. Which 3D printing technology will inspire your best work...?





PolyJet™

Photopolymer Jetting

Our PolyJet technology offers full-color, multi-material capabilities, perfect for hyper-realistic CMF prototypes that can include varied textures, gradients, and transparencies.

Precision Prototyping with Vibrant Realism

Propel your CMF prototyping from the great to the extraordinary, with over 600K color combinations and Pantone Validated palettes to achieve the ultimate design fidelity. Coupled with our innovative material engineering, you can blend rigid and flexible materials to meet specific needs and create hyper-realistic prototypes with a broad spectrum of digital materials.

Accelerated and Scaled Prototyping

Our High-Speed Printing Mode doubles the speed in multi-material configurations and dramatically reduces the time from design to prototype, while our large-scale prototyping capabilities offer high accuracy for those more substantial parts. With PolyJet, you can scale up without compromising on the intricate details that make your prototypes stand out.

Advanced Capabilities with GrabCAD Print Pro™

Unlock advanced capabilities with your PolyJet printer through GrabCAD Print Pro software, expanding your creative possibilities, accommodating a variety of materials and textures. Now you can easily create complex prototypes with intricate details, embedded electronics, and microfluidic channels.



Why Choose PolyJet?

- **Vibrant Realism:** Unparalleled design fidelity for hyper-realistic CMF prototypes.
- **Speed and Scale:** Shorter design-to-prototype time, even for large-scale parts.
- **PolyJet and GrabCAD Print Pro:** Customization features such as Smart Insert™, Print-on-Object and Print-on-Tray.
- **Make Better Design Decisions:** Protect your IP, iterate faster and communicate better.





SLA

Stereolithography

SLA's precision and ability to create smooth, detailed prototypes make it an excellent option for parts that demand high aesthetic quality - and provides a great base for paint finishes. Ideal where large, complex and visually impactful prototypes are necessary to convey the final product's look and feel, SLA technology from Stratasys is the choice of professionals who need reliable operation and exceptional accuracy.

Outstanding Accuracy, Surface Quality and Detail

The Neo 3D printer reduces finishing times by up to half, thanks to an optimized design harnessing the latest technology for its laser and scanners. This results in parts with excellent layer alignment, dimensional accuracy, and sharp feature resolution, ensuring prototypes are not just precise but also have superior sidewall quality and detail.

Efficient Large-Scale Printing

Print large prototypes or multiple smaller parts with industry-leading detail in a single build. With no need to piece together sections, the prototyping process is streamlined, with consistently reliable and variable-free results across the entire build area.

Engineered for Excellence

Every aspect of the Neo printer has been meticulously developed with the end-user in mind. Constructed with the finest components for enhanced reliability and equipped with user-centric software updates, the Neo printer reflects our commitment to delivering an exceptional prototyping tool that meets and surpasses the needs of engineers in various fields.

Why Choose Neo Stereolithography?

- **Cost-Effective Quality:** Precise, high-quality finishes that halve post-processing requirements.
- **High Uptime and Yield:** Dependable operation and peak productivity.
- **Versatile Applications:** Open Material License unlocks a wide range of materials.
- **Intuitive Software:** Robust functionality, including part tracking and reporting.
- **Exceptional Support:** Customer service that includes remote diagnostics and on-site assistance.





FDM®

Fused Deposition Modeling

FDM is renowned for its reliability, durability and cost-effectiveness – along with with a broad range of versatile materials - perfect for concept modeling and early-stage visual prototyping.

Uncompromising Reliability and Simplicity

FDM technology brings unparalleled ease and reliability to visual prototyping, ensuring your projects succeed from the very first print. Forget the hassle of dialing -in temperatures or adjusting speeds, our FDM solutions deliver consistent results, freeing engineers to focus on innovation rather than troubleshooting.

Accessibility for Every Engineer

Designed with simplicity in mind, FDM printers are a staple in the manufacturing environment. They empower every engineer, regardless of experience, to bring their designs to life. With prints that can be started overnight and ready by morning, and the intuitive GrabCAD Print software boasting a mere 10-minute learning curve, prototyping has never been more accessible.

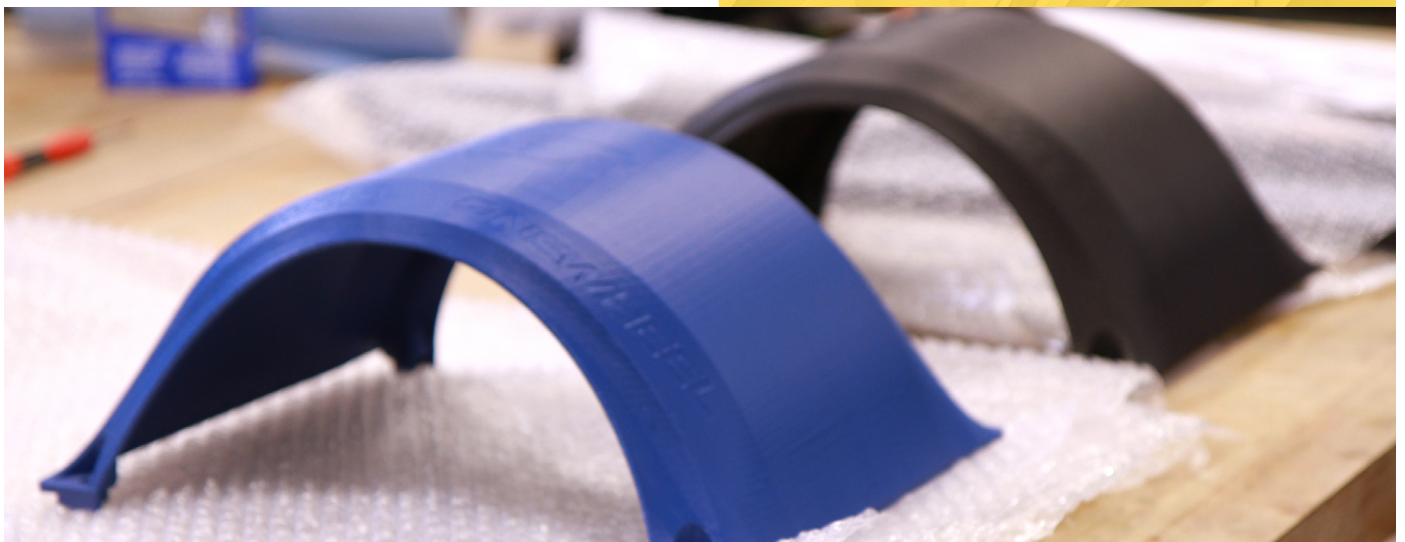
Boost your Design Cycle

Imagine having an extra designer at your disposal 24/7. With FDM technology allowing rapid iterations, designs can be refined and tested at an unprecedented pace, freeing up time and attention for innovation.



Why Choose FDM?

- **Consistent Performance:** Reliable, durable and cost-effective.
- **Material Versatility:** A wide range of materials to suit your needs.
- **Ease of Use:** A celebrated user-friendly interface anyone can use.
- **Large Build Volume:** Create large prototypes without sacrificing quality or detail.





Whatever your Vision, there's a Resin to Bring it to Life.

3D printing technology has come a long way and with the expansion of capabilities and material choices comes greater possibilities for product engineers.

Choose from a wide range of thermoplastic polymers, photopolymers, and composites depending on your desired application.

Opt for Open Materials for maximum versatility, or Validated Materials - developed to work seamlessly with our printer technology.

Dissolvable support structures slash post-processing time, and the ability to blend materials provides limitless textures and properties.



Your material options for different technologies:

FDM

- Wide range of available thermoplastics – engineering grade to high-performance
- Includes carbon-fiber materials for high-strength applications

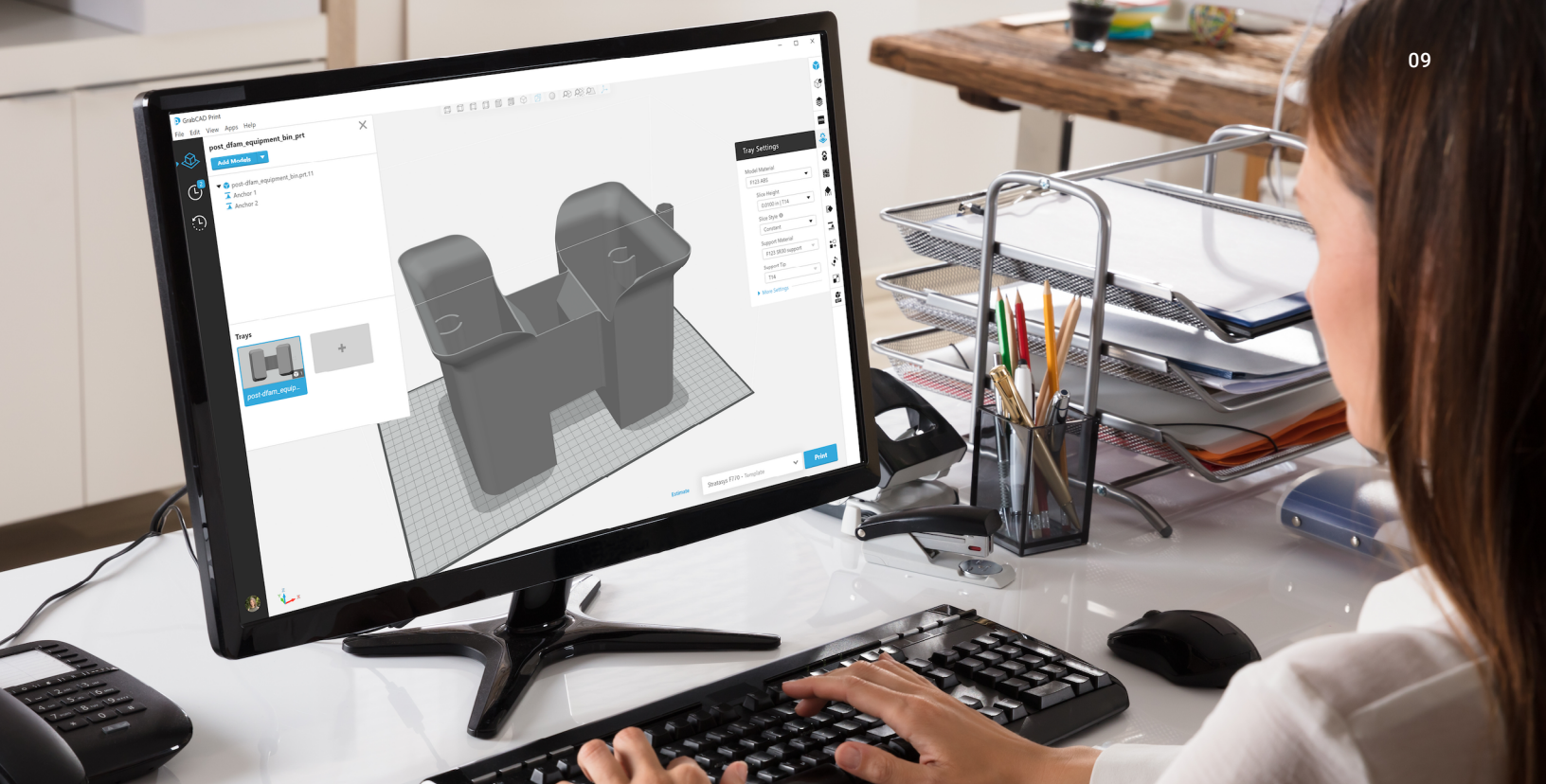
PolyJet

- Thermoset resins with many color options and combinations for new digital materials
- Capable of producing many characteristics – transparent, opaque, rigid, flexible

Stereolithography

- Assorted range of resins offering suitability for diverse set of applications
- Resins with superior clarity, structural integrity, and thermal resistance





Powerful, Intuitive Software

GrabCAD Print™

Simplify your workflow! One of the key benefits of GrabCAD Print is its user-friendly interface. The software is easy to navigate, even for beginners, and provides a streamlined workflow that allows designers to quickly create and modify 3D models for printing. Furthermore, GrabCAD allows for collaboration between team members, making it easy to share designs, collaborate on projects, and provide feedback.

GrabCAD Print supports a variety of file formats, including STL, OBJ, and STEP, allowing designers to work with a wide range of 3D modeling software. Plus, the software is cloud-based, which means that designs can be accessed from anywhere and on any device with an internet connection.

GrabCAD Print provides a range of material options, allowing designers to choose the right material for their project. One of the best benefits of using GrabCAD Print, our software automatically generates support structures for 3D models, making it easier to print complex designs.

GrabCAD Print Pro™

GrabCAD Print Pro for PolyJet and FDM helps reduce manpower and costs by taking automated processes, traceability and per-part estimations a step further, so you can take your prototypes from 'Great to WOW!'

With PolyJet, the Smart Insert™ feature allows for the integration of functional components or decorative elements mid-print, adding a new level of functionality to your prototypes. Print-on-Tray capabilities ensure immaculate surface finishes such as glass or brushed textures, while Print-on-Object enables direct printing onto items like phone cases for unparalleled customization.

On the FDM side, GrabCAD Print Pro delivers precise part accuracy essential and per-part time estimation for multiple models, enhancing planning efficiency. The template function streamlines your workflow by saving print settings, and labeling features integrate seamlessly into job preparation.



What are Others Doing?

Additive manufacturing empowers creative minds to explore and iterate designs rapidly, bringing to life prototypes that not only look but feel like the final product. In the competitive arena of product design, this ability to quickly visualize and refine is invaluable.

Maybe you're a product designer for consumer electronics and wearables, where you're aiming to fuse beauty with function, and often under pressure to rapidly evolve designs while captivating your users.

Perhaps you're crafting automotive parts, and you want to integrate the plushness of luxury with the tangibles of manufacturing and the non-negotiables of safety, all against the unforgiving tick of the development clock.

And if your canvas is white goods, you may be tasked with blending durable functionality with aesthetic trends to keep pace with the ever-changing landscape of home fashion.

See what others are doing...

Advanced CMF Prototyping with PolyJet

Customer: Microsoft

Controllers that bring the "wow" factor with new colors, graphics and button treatments are hot commodities in a crowded market.

PolyJet technology transformed Xbox's ABXY button prototyping process. Using the J850 Prime's full color, multi-material 3D printing capabilities has allowed Xbox designers to iterate design details effortlessly. The speed, accuracy and large range of colors on the Stratasys J850 Prime has opened up new worlds of creative possibility.





Concept Visualization with Stereolithography

Customer: Ogle Models and Prototypes

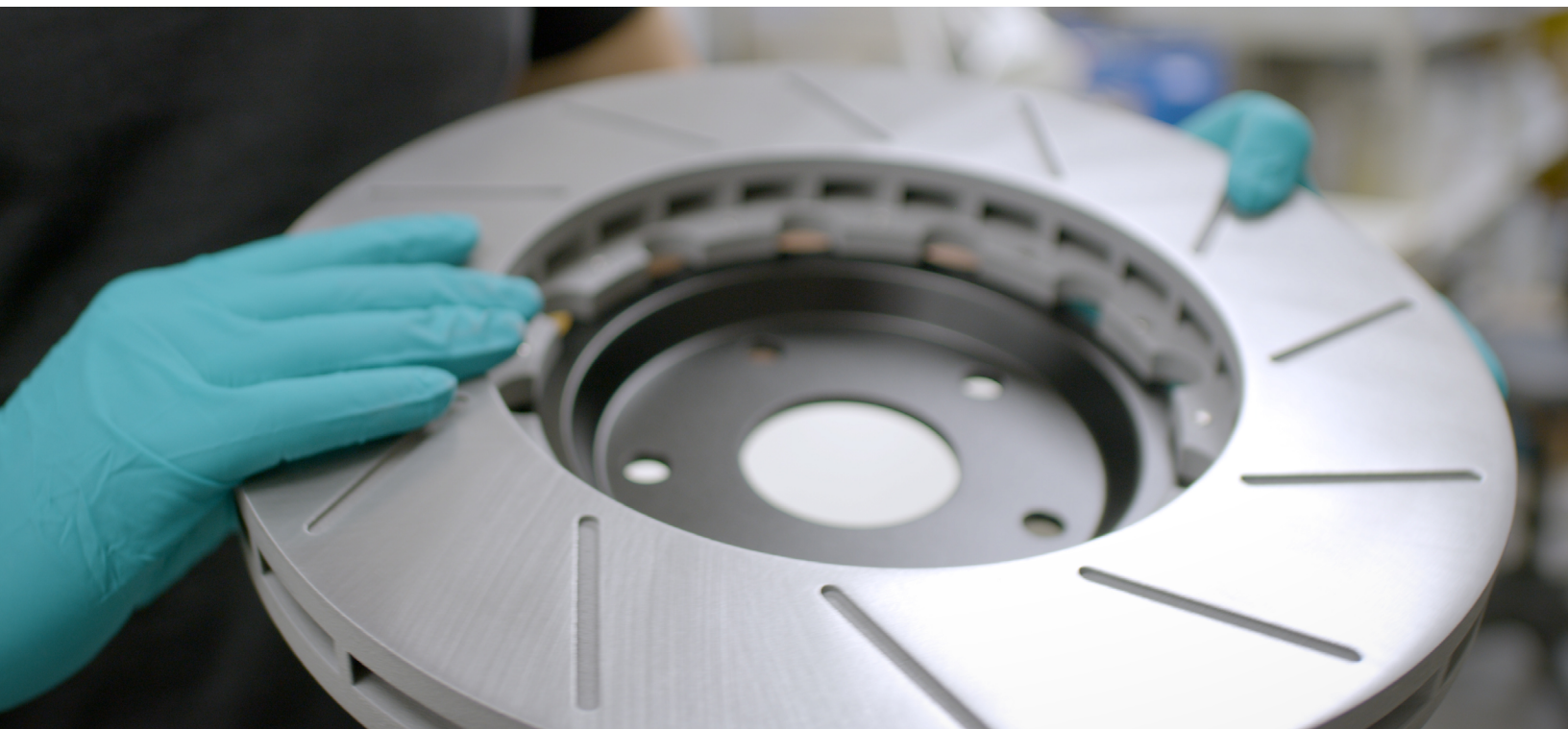
As part of its constant forward gaze, Ogle was among the first model makers in the UK to recognize that 3D printing was going to revolutionize the way models and prototypes are created.



“

With client demand for 3D printing increasing across the product development cycle, we looked to update and expand our capacity with the latest SLA technology. The Neo proved to be the best solution with a larger build size, faster print speed, and more flexibility, quality and reliability.”

Philip Martin
Director, Ogle Models and Prototypes





Large-Scale Visual Prototyping with FDM

Customer: Sub-Zero

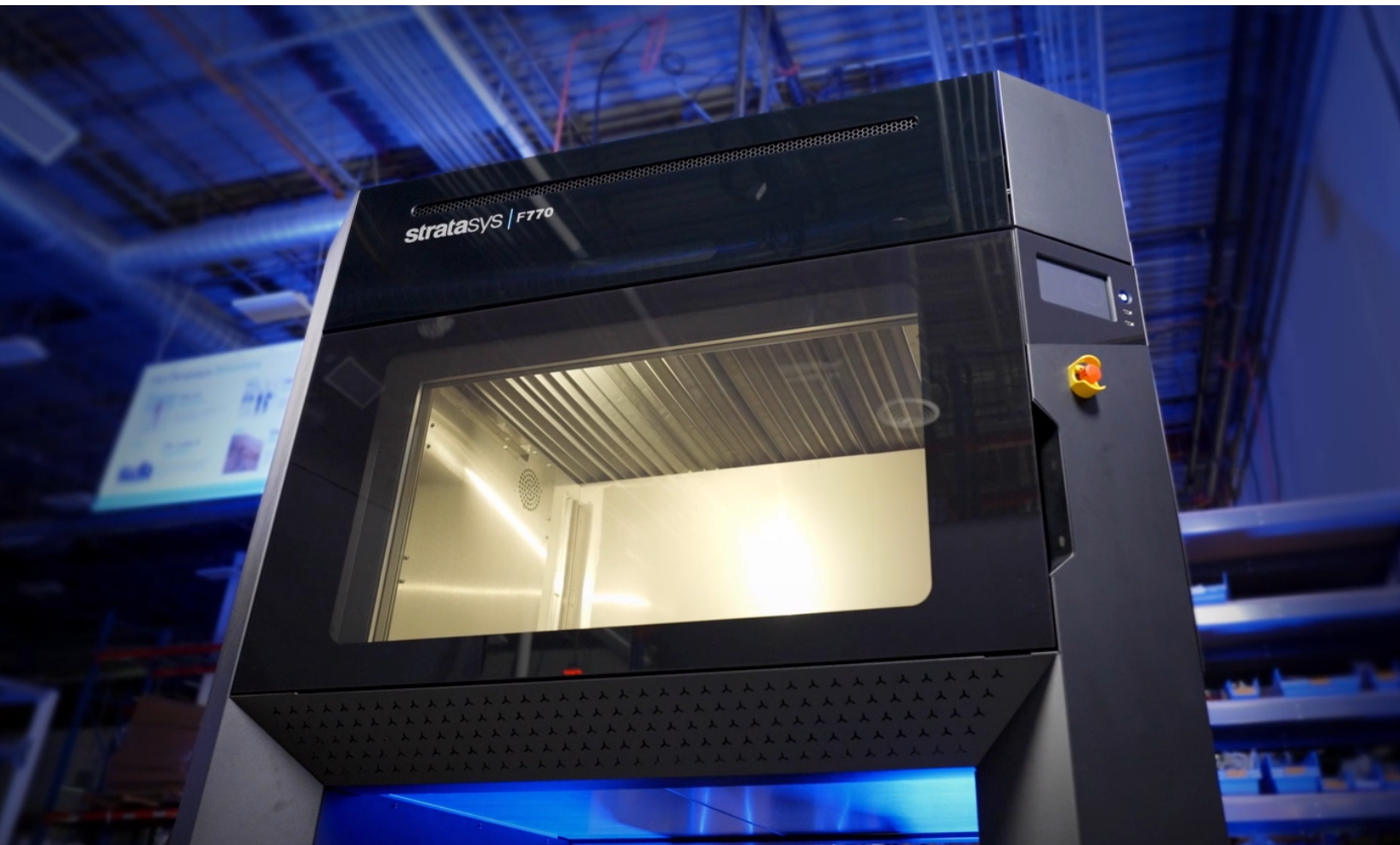
In the quest for efficient space management within their luxury refrigerators, Sub-Zero Group leans heavily on FDM, particularly during the crucial stages of concept modeling and prototyping. Offering large-scale printing capabilities, reliability, and affordability, FDM allows Sub-Zero to bring the prototyping process back in-house, significantly reducing development time and cost while enhancing the ability to iterate and validate designs.

“

Those printers never shut off. We need the throughput. And I don't know where we'd be without them. We've become so accustomed to having them as part of our arsenal.”

Doug Steindl

**Corporate Development Lab Supervisor,
Sub-Zero Group**





Appendix 1

Primary Visual Prototyping Capabilities

Large Parts Printing: Offers high accuracy on an open platform for large parts, pushing the boundaries of regular prototyping. (Stereolithography and FDM)

Material Engineering: Our capability to blend rigid and flexible materials creates a wide range of digital materials with varying shore values, pushing beyond traditional prototyping. (FDM and PolyJet)

Full Color Multi Material 3D printing: Transition from regular to an advanced level with over 600K color combinations and Pantone Validated pallets. (PolyJet x GrabCAD Print Pro)

Print-on-Tray feature: Print directly on tray to achieve a perfect surface finish on glass, carbon fiber, and more, advancing beyond the norm in 3D printing. (PolyJet x GrabCAD Print Pro)

Smart Insert™ feature: Pause and resume print to allow insertion of elements during print such as electronic chips, fastening elements, in-print decoration and more. (PolyJet x GrabCAD Print Pro)

High-Speed Printing Mode: Double printing speed at DM2 (2-material configuration), surpassing traditional 3D printing speeds. (PolyJet x GrabCAD Print Pro)

Air-as-Material: Utilize air as a material to finesse finished surfaces or to accurately model weight and cavities for integrations such as embedded electronics. (PolyJet x GrabCAD Print Pro)

Support-as-Material: Take control of your design with the ability to use support structures as model material, enhancing textures and tooling applications. (PolyJet x GrabCAD Print Pro)

Liquid-as-Material: Push designs further with microfluidic structure printing, perfect for high-precision applications. (PolyJet x GrabCAD Print Pro)

Print-on-Object: Expand your creative canvas by printing directly onto objects like phone cases or cosmetic packaging for a truly customized experience. (PolyJet x GrabCAD Print Pro)

Stratasys Headquarters

7665 Commerce Way,
Eden Prairie, MN 55344
+1 800 801 6491 (US Toll Free)
+1 952 937-3000 (Intl)
+1 952 937-0070 (Fax)

1 Holtzman St., Science Park,
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000
+972 74 745 5000 (Fax)

[stratasys.com](https://www.stratasys.com)

ISO 9001:2015 Certified

