stratasys

BROCHURE
MEDICAL

J850™ Digital Anatomy Printer Solutions

Better Preparation.
Better Outcomes.

J850 Digital Anatomy Printer
Proven Anatomical Realism.

J850 Digital Anatomy™ printer technology creates models that replicate the same biomechanical properties as human tissue to provide the most realistic testing and training.

With highly repeatable medical device testing and surgical preparation, you can create consistency across the continuum of care — all at a cost reduction of up to 70% compared with fabricated simulators, animals and cadavers.

Medical Device Companies

Drive innovation forward.

Create consistency in testing to enhance product quality, reduce costs and accelerate time to market. Digital Anatomy 3D printed models provide high repeatability between samples, minimizing confounding variables and allowing for clinically relevant benchtop testing.

Academic Medical Centers and Hospitals

Make training more efficient and cost-effective.

Minimize variation in a clinical setting with highly realistic, low-risk training. Digital Anatomy 3D printed models give physicians the opportunity to standardize surgical skills and delivery of care by practicing on the most accurate representation of the targeted pathology.

Anatomical Realism
You Can See and Feel.

Experience the most consistent, accurate representation of your targeted pathology.

The Digital Anatomy printer software gives you the power to create the most lifelike anatomical models available. Clinically validated preset anatomy options deposit 3D printing materials to behave with biomechanical accuracy that mimics human tissue and bone like never before.

Structural Heart

Experience the physiological response of native cardiac tissue.

See the accurate biomechanical behavior associated with gender, age, ethnicity and other physiological and pathological characteristics.

Feel realistic feedback while suturing, cutting, inserting and deploying devices.

A study comparing the biomechanical properties of porcine tissue to 3D printed myocardium found that Digital Anatomy printed models mimic real tissue better than any other material.[1]

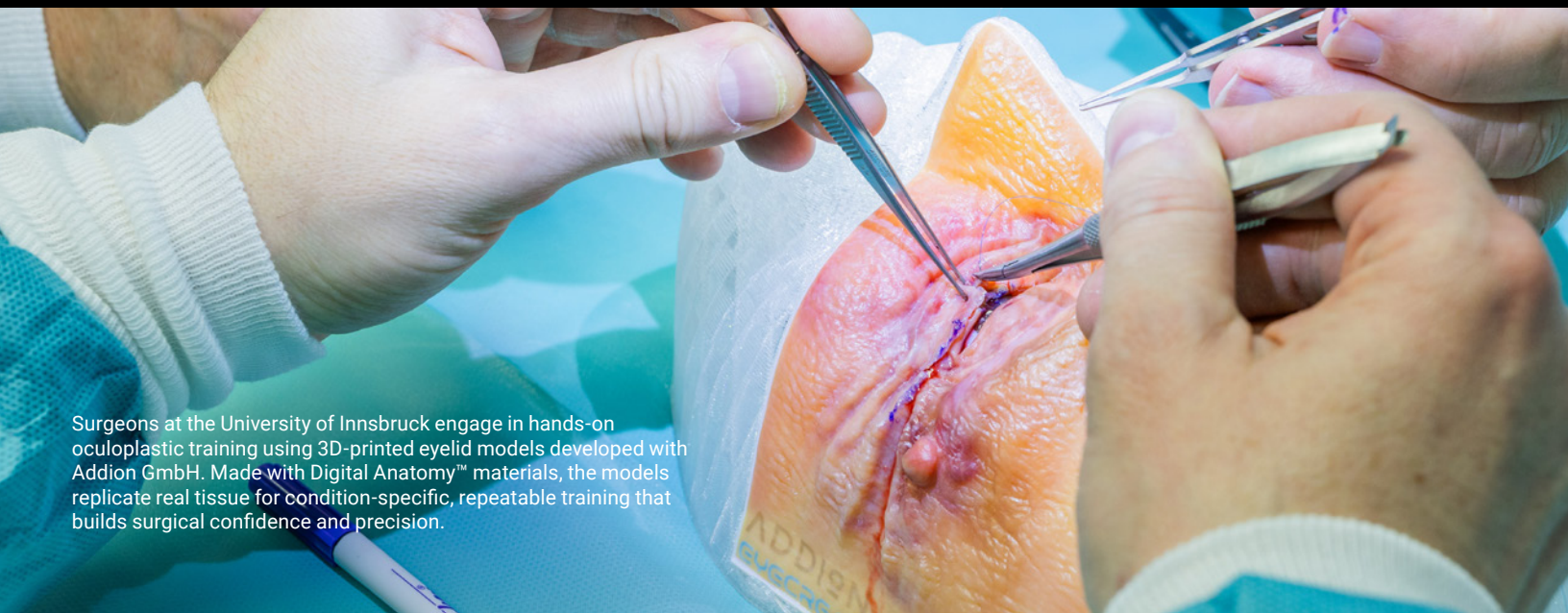
Blood Vessels

Experience the arterial elasticity caused by changes in blood pressure and disease.

See how the artery will move as internal and external forces are applied with blood vessel material that mimics vessel degeneration.

Feel realistic vessel responses while inserting and deploying devices.

A study comparing 3D printed aortic, carotid and coronary artery models to native vessel behavior found that the Digital Anatomy printer creates the most accurate arterial models available.[2]



Surgeons at the University of Innsbruck engage in hands-on oculoplastic training using 3D-printed eyelid models developed with Addion GmbH. Made with Digital Anatomy™ materials, the models replicate real tissue for condition-specific, repeatable training that builds surgical confidence and precision.

Radiopaque

Radio realistic models with full contrast options. Print models that not only look like real anatomy with a similar biomechanical behavior, but also have the same results under a CT scan.

See radiopaque properties just like real tissue under CT and X-ray imaging.

Control the radiopacity properties of each printed model. Choose the material mixture to get the desired radiopacity level (HU value) and print with repeatable and accurate results.

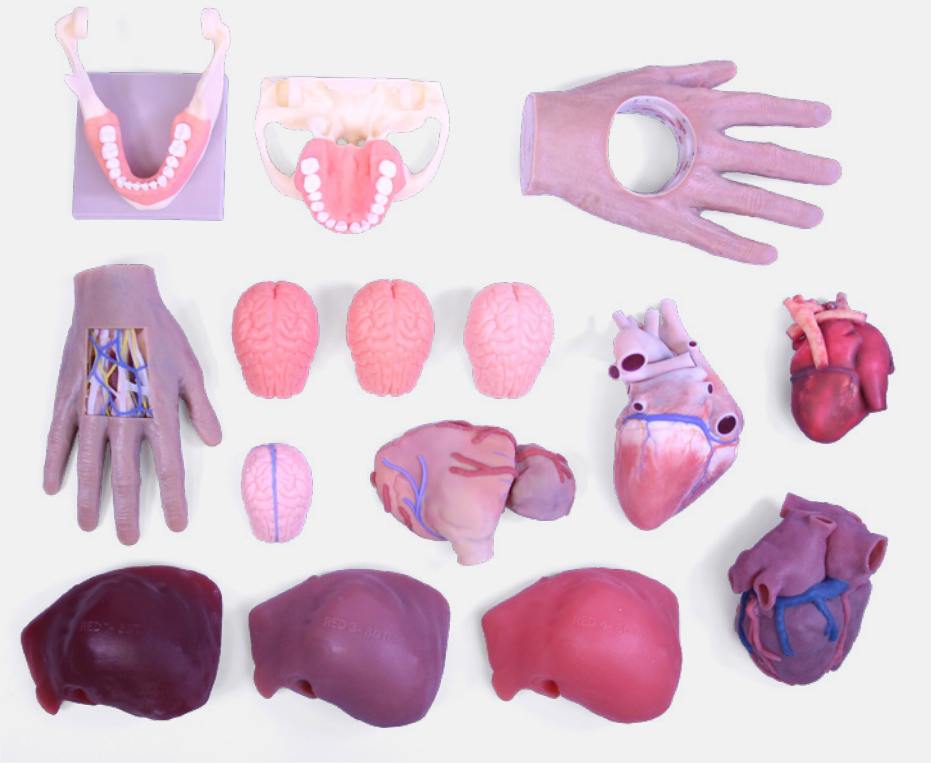
Musculoskeletal

Experience the density properties of human bone.

See accurate bone articulation with variations in cancellous and cortical density.

Feel realistic feedback while tapping, reaming, sawing, inserting screws and attaching plates.

Biomechanical testing confirmed the driving torque and pullout force of screw fixation in 3D printed bone models have similar haptic responses to human bone.[3] Mechanical tests confirm spine models accurately simulate the natural axes of movement of the human spine as the following forces are applied: disc compression, extension, flexion, lateral bending and axial tension.[4]



Soft Visual Anatomy

Offers a unique combination of visual realism and softness.

See enhanced anatomical visuals and color accuracy that provide a new dimension in anatomical realism

Feel An unmatched balance of softness and visual accuracy, essential for medical device training and anatomical education.

General Anatomy

Experience the response of native organ tissue.

See the accurate biomechanical behavior associated with organ structures and disease states.

Feel realistic feedback while suturing, cutting, inserting and deploying devices.

Innovative Materials
Make It Possible

Unlock unique material combinations that create realistic models that vary in softness, flexibility, and density, mimicking native tissue behavior. The unique voxel-based engine of the J850 Digital Anatomy 3D Printer will automatically generate your model's detailed anatomical structures giving it the look and feel of the real thing.

Utilizing the Digital Anatomy Printer unique and exclusive materials, enables the creation of over 1000 unique digital materials to create complex, multi-texture structures.

- **GelMatrix®** — Unique GelMatrix material and GelSupport™ depositing patterns allow you to print small, complex vascular structures and easily remove internal support material.
- **TissueMatrix®** — Sophisticated material configurations allow for models that feel and behave like native organ tissue when force is applied.
- **BoneMatrix®** — Complex material depositing patterns mimic porous bone structures, fibrotic tissues and ligaments.
- **RadioMatrix™** — Radiopaque 3D print material gives you the power to create medical models that exhibit realistic features under X-Ray and CT.

Digital Anatomy Software
The Power to Create.

Digital Anatomy printer software gives you the power to create the most lifelike anatomical models available.

Clinically validated preset anatomy options deposit 3D printing materials to behave with biomechanical accuracy, mimicking human tissue and bone like never before.

The power to produce accurate biomechanical behavior.

Anatomies are configured using unique material combinations that vary in softness, flexibility and density to mimic native tissue behavior.

The power to create models in a few simple clicks.

The preset anatomy menu offers more than 100 options that allow you to print accurate, lifelike models by simply choosing the desired anatomy.

The power to mimic native tissue and bone structures.

- **Complex Blood Vessel Capabilities** — Create and remove support structures from internal cavities such as small, complex blood vessels.
- **Slice Preview** — Visualize individual slices of internal anatomy structures and confirm pathology, material and orientation choices.
- **Screw Insertion Strain Relief** — In orthopedic models, create regions for screw entry so you can place screws without cracking the model.
- **Long Bone Manipulation** — Autogenerate the intricate, unique structures of bone in each region: proximal, distal, cortical, cancellous and the medullary canal.
- **Myocardium Consistency** — Experience the same non-directional behavior as human tissue when force is applied in any direction.

The power to print with physician-tested, validated presets.

Digital Anatomy printer software was developed and refined over years of expert testing in partnership with top academic medical centers and hospitals across the globe.

The power to control Radiopacity values

The Digital Anatomy printer software enables easy control over the desired values to mimic different tissues under CT/X-ray.

Digital Anatomy Creator

The freedom to create!

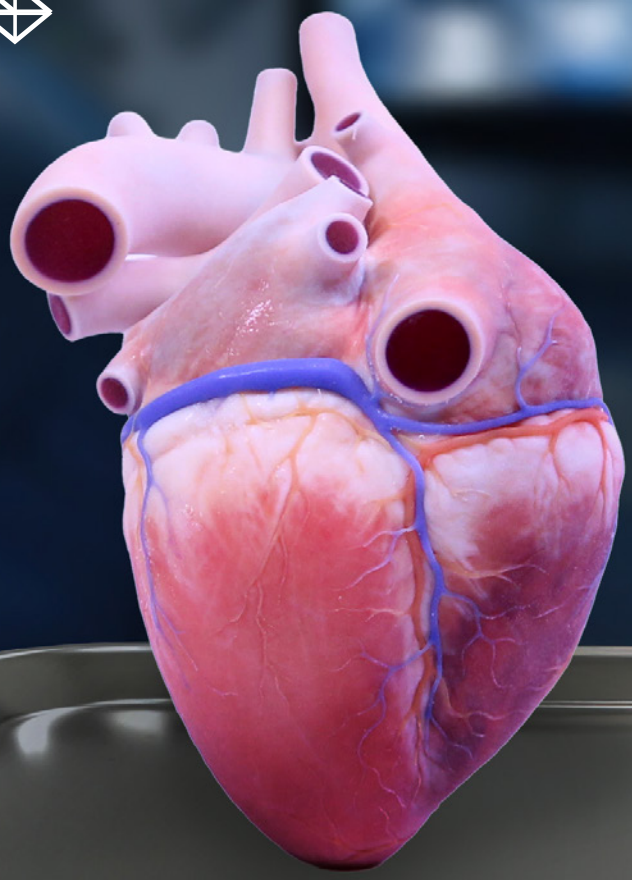
Push the boundaries of functional medical models with the new Digital Anatomy Creator software add-on package for the Stratasys Digital Anatomy 3D printer.

The Creator software is an extension to the GrabCAD® Digital Anatnomy 3D printing software intended for advanced users seeking to expand their personalized medicine arsenal.

Visual Model

Demonstration

This heart model can be printed using either rigid Vero™ materials or the Soft Visual family, showcasing the J850 Digital Anatomy printer's ability to produce anatomical models with fine detail, multi-color capability, texture gradients, transparency, and variable softness and durometer levels.



Functional Model

Surgeon training and device testing

This heart model features functioning cords, annulus and valves with leaflets, created with the J850 Digital Anatomy printer's cardiac application. It combines the ultra-soft TissueMatrix material with Agilus30™ to mimic the feel and response of myocardium, giving realistic haptic feedback during device insertion and deployment.

J850
Digital Anatomy printer

Create in a few simple clicks.

The preset anatomy menu offers more than 100 options that allow you to print accurate, lifelike models by simply choosing the desired anatomy.

- Adjust attributes to mimic healthy or diseased tissue.
- Make post-processing quick and easy.
- Remove gel support material from complex vessels with little to no effort.

Access advanced design tools when you need them.

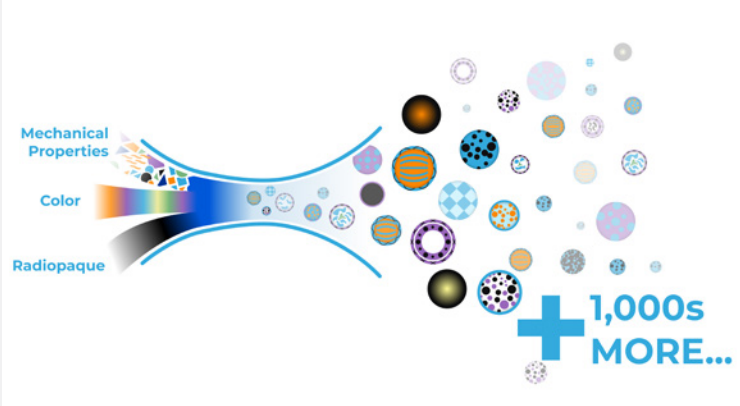
Advanced design tools allow you to choose from more than 600,000 colors when full-color capabilities are needed, define transparencies, and determine textures and finishes.

Save valuable resources.

Minimize the need for animal and cadaver labs so you can test and train anywhere, cut procurement costs and improve ethical practices.

Achieve up to
70% cost reduction*

*Compared to fabricated simulators, animal studies and cadaver usage.



4 unique base materials provide
1,000+ anatomical presets

Product Specifications

Model Materials	**Rigid materials:** • VeroUltra™ opaque family materials • Vero™ family colors materials • Transparent VeroClear™ and VeroUltraClear • ToughONE™ for excellent impact resistance and flexibility **Rubber like materials:** • Agilus30™ Transparent and Colors flexible materials • TangoPlus™ and TangoBlackPlus™ flexible materials **Digital Anatomy™ materials:** TissueMatrix™ (MED310) GelMatrix™ (FLG110) BoneMatrix™ (RGD516) RadioMatrix™ (MED410) **Biocompatible materials:** Biocompatible Clear (MED610) Biocompatible Opaque (MED615RGD™ IV) Biocompatible Digital ABS Plus™ (MED531 and MED515+) Biocompatible MED625FLX (Flexible and transparent)
Digital Materials	**Unlimited number of composite materials, including:** • Over 600,000 colors with VeroUltra • Rubber-like materials in a variety of Shore A values • Ultra-soft rubber-like material with a Shore 00 value • Translucent color tints
Support Materials	SUP705B (waterjet removable) SUP706B (soluble) GelMatrix (waterjet removable)
Build size	490 x 390 x 200 mm (19.3 x 15.35 x 7.9 in.)
Layer Thickness	Horizontal build layers down to 14 microns (0.00055 in.)
Network Connectivity	LAN – TCP/IP
System Size and Weight	1,400 x 1260 x 1,100 mm (55.1 x 49.6 x 43.4 in.); 430 kg (948 lbs.)
Material Cabinet	670 x 1,170 x 640 mm (26.4 x 46.1 x 25.2 in.); 152 kg (335 lbs.)
Operating Conditions	Temperature 18 – 25 °C (64 – 77 °F); relative humidity 30 – 70% (non-condensing)
Power Requirements	100 – 120 VAC, 50 – 60 Hz, 13.5 A, 1 phase 220 – 240 VAC, 50 – 60 Hz, 7 A, 1 phase
Regulatory Compliance	CE, FCC, EAC
Software	GrabCAD Print Digital Anatomy software. Optional add-on GrabCAD Print Pro and/or Digital Anatomy Creator software

Product Specifications

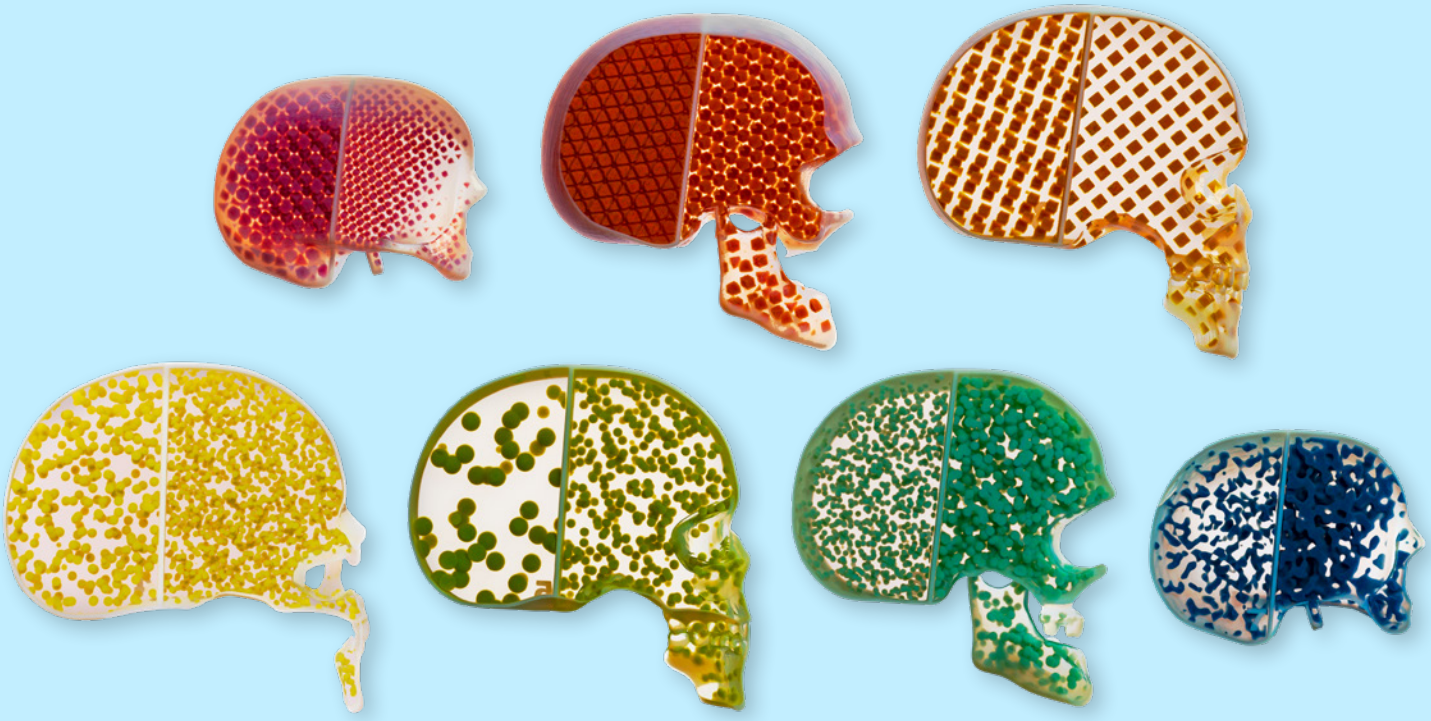
Build Modes	High Quality (HQ) – 7 different materials / 14µm layers High Mix (HM) – 7 materials / 27µm High Speed (HS) – 3 materials / 27µm, x2 speed Super High Speed(SHS)- 1 material / 54 µm, x4 speed
Accuracy	Typical deviation from STL dimensions, for models printed with rigid materials, based on size: under 100 mm: ±100µ; above100 mm: ±200µ or ± 0.06% of part length, whichever is greater. Please refer to material-specific spec sheets for accuracy estimates.

[1] Severseike, Leah et al., "Polyjet 3D Printing of Tissue-Mimicking Materials: How Well Can 3D Printed Synthetic Myocardium Replicate Mechanical Properties of Organic Myocardium?," bioRxiv, 2019, doi.org/10.1101/825794.

[2] Sparks, Adam et al., "Digital Anatomy Printing (DAP): A Direct Characterization of DAP Materials for Use as Compliant 3D-Printer Arteries Using Intravascular Ultrasound (IVUS)," The Jacobs Institute, Submitted for publication, 2020.

[3] Dahan, Gal, "Synthetic Bones vs. Human Bones for Screws Testing: A Literature Survey," In progress, 2020.

[4] Barak, Yaron, "Biomechanical Evaluation of a Printed Digital Anatomy Lumbar (L3-S1 Spine Model), Technion Institute of Technology Materials Science and Engineering Laboratory, Final Report (2020).



Pediatric cardiologists at SickKids Hospital practice complex procedures on 3D-printed heart models—supporting surgical planning, training, and patient education through anatomically accurate simulation.

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Certified

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