



Digital Anatomy Materials: GelMatrix®

In order to enrich the medical modeling field and enable the creation of more realistic anatomical models, Stratasys has developed a new series of Digital Anatomy™ Materials.

This information includes a collection of materials that can be used to mimic human tissue.

Mixing these materials in different ratios, along with PolyJet™ materials such as the Vero™ family and Agilus30™, can generate a range of shore values to create almost any anatomy in the human body. This family of materials opens new possibilities to enrich medical modeling — to create models with mechanical properties similar to any type of tissue, educate, suture, puncture, drill, stretch and perform mechanical tests for research and medical practice.

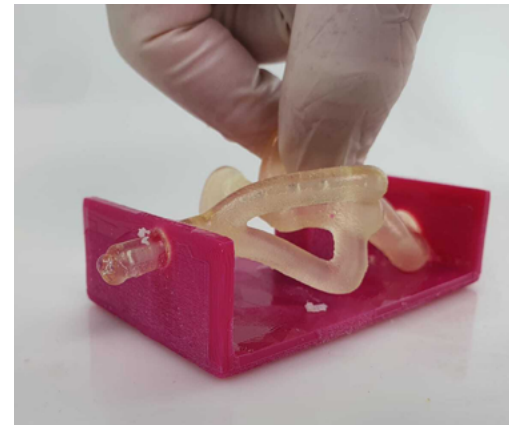


GelMatrix

The watery translucent material GelMatrix is used to mimic soft and damp tissues and as an easy-to-remove support material for small cavities like in blood vessels for instance. This material cannot be printed as pure material due to its softness and instability; it should be mixed with other, more stable materials such as Agilus30. Example anatomy presets include:

- Liver
- Subcutaneous Fat
- Gel Support
- Pure Gel Support

To ensure proper curing while printing a preset that contains GelMatrix, use only one UV lamp in the curing process of each layer. Using two UV lamps can cause the edges of the model to burn. Due to its unstable properties, this material does not have consistent mechanical properties.



Properties	GelMatrix
Printer	Digital Anatomy™ Printer
Print Mode	High Mix, High Speed
Support Material	SUP706
Number of UV Lamps	2
Color	Translucent
Maximum Amount	550 g (to avoid overflow in the waste bath)

Collaborations Make Development

Stratasys has collaborated with the top research and medical institutes to develop a library of anatomies that can be printed for research, surgical planning and education using the Digital Anatomy printer and PolyJet materials.

Medtronic

Scientists and engineers from global leader in medical device manufacturing, Medtronic, performed a series of tests to compare the compliance of Stratasys Myocardium and Liver presets to porcine tissues. The results showed a remarkable compatibility between the two. For more information, read the white paper [“PolyJet 3D Printing of Tissue Mimicking Materials: An Investigation of Characteristic Properties of 3D Printed Synthetic Tissue.”](#)

Jacobs Institute

The Jacobs Institute, a medical innovation center that focuses on vascular medicine, reviewed the use of 3D printed models for pre-surgical planning. They used a Stratasys 3D printed neurovascular model for pre-surgical planning of aneurysm surgeries. The compliance and realism of the printed model and its materials gave the surgeons the opportunity to prepare properly for the procedure. In 2020, these scientists performed an extensive set of experiments to explore the accuracy of Digital Anatomy materials and vascular presets, and the results were remarkable. For more information, read the white papers [“Compliant vascular models 3D printed with the Stratasys J750: a direct characterization of model distensibility using intravascular ultrasound.”](#)

