True Phantom Solutions Inc.

Product Catalog

Date: 12/02/19

TRUE PHANTOM
SOLUTIONS

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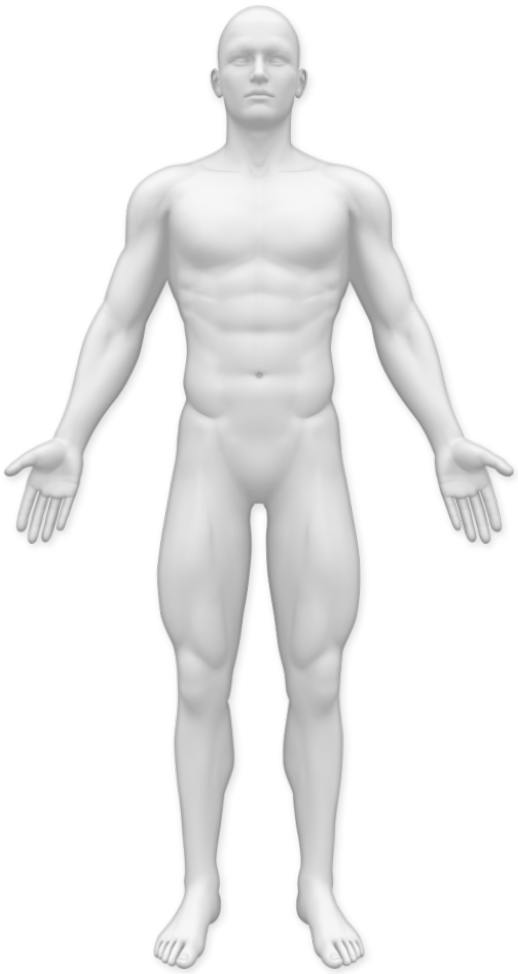
True Phantom Solutions

Expertise in Ultrasound, MRI, X-Ray, CT & Sonography phantoms

A multinational biomedical company that manufactures anatomically correct human body parts that are also known as phantoms. These phantoms or medical simulators are highly realistic and lifelike models that can be used to carry out scientific research & development and medical training. Compatibility with Ultrasound, MRI, CT, and X-Ray makes our product unique and valuable.

Lowest prices guaranteed | 1-2 Year product warranty | Lifetime customer service



Who do we help?

TPS has developed the unique technology of synthetic materials used to create phantoms with realistic, life-like properties. These materials have highly realistic acoustical, physical, and mechanical properties which are identical to those of real human tissues.

Our phantoms are compatible with Ultrasound, MRI and CT medical diagnostic techniques and they may vary from simple cubic shapes to highly customized human-like copies. Through the use of 3D printing technology, exact patient models can be fabricated based on individual orders.

Our products are one-of-a-kind. We customize our phantoms to fit individual customer specifications for their unique biomedical needs.

Who do we help?

- Researchers/scientists who develop new medical devices;
- Medical and nursing students who require tools to practice their hands-on skills;
- Neurosurgeons who perform non-invasive neurosurgical HIFU procedures;

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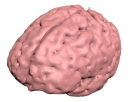	**Brain Perenchyma**	SB-A01	**29**
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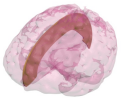	**Falx Cerebri**	FX-A01	**33**
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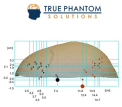	**Foreign Objects**	FO-C01	**35**
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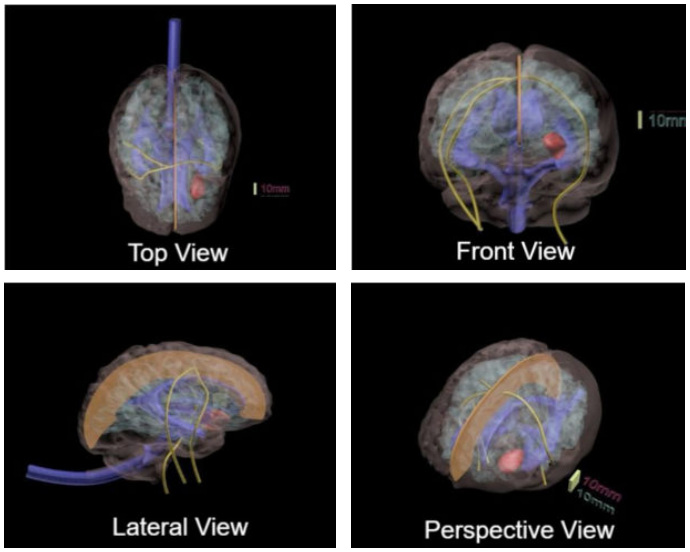
BN-A02

Adult Brain (Complex)



Anatomically Correct Complex Brain Phantom

The phantom is designed based on an average brain and it is made out of realistic tissue mimicking materials suitable for Ultrasound, MRI and CT applications. The Phantom has the following features:

- Geometry & dimensions of an average human brain
- White & Grey brain matter
- Brain ventricles
- Brain tumor
- Blood vessels with 2mm inner diameter and one bifurcation
- Falx cerebri

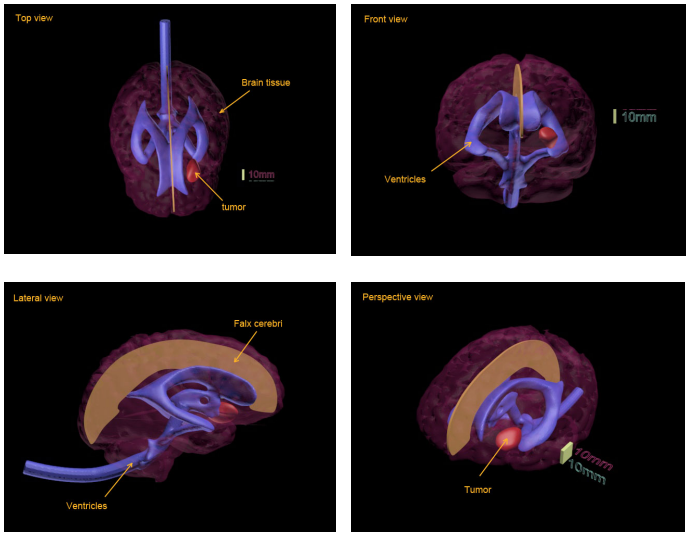
Upon special request, the phantom features and the properties of the tissue mimicking materials can be customized based on the requirements of any particular project.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Brain grey matter	1400 ± 10	0.99	20	70	VARIABLE	1.0 ± 0.2
Brain white matter	1400 ± 10	1.01	35	60	YES	1.3 ± 0.2
Falx cerebri	1400 ± 10	1.01	60	50	YES	1.7 ± 0.2
Tumor feature	1400 ± 10	1	30	65	YES	1.2 ± 0.2

BN-A01

Adult Brain (Standard)



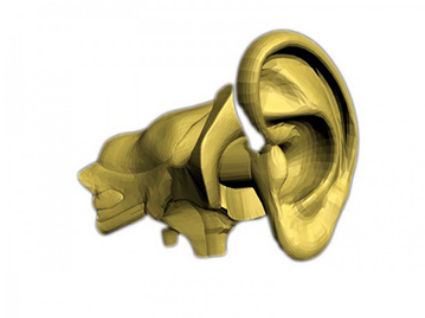
Standard Adult Brain for multipurpose

The phantom is designed based on an average brain and it is made out of realistic tissue mimicking materials suitable for Ultrasound, MRI and CT applications. The Phantom has the following features:

- Geometry & dimensions of an average human
- Realistic brain tissue
- Brain ventricles
- Brain tumor
- Falx cerebri

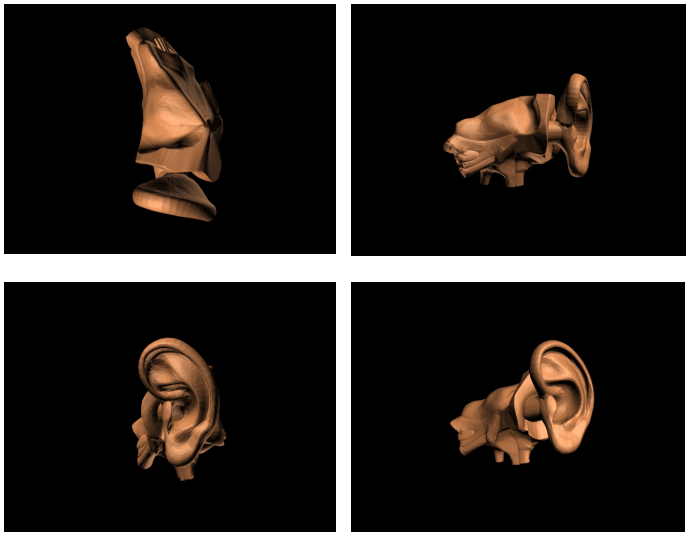
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Brain tissue	1400 ± 10	0.99	20	70	VARIABLE	1.0 ± 0.2
Falx cerebri	1400 ± 10	1.01	60	50	YES	1.7 ± 0.2
Tumor feature	1400 ± 10	1.00	30	65	YES	1.2 ± 0.2



ER-A01

Adult Ear



Ear Phantom for R&D is a product with a precised anatomy of a human ear and it can be used for research and development of a noise reduction equipment.

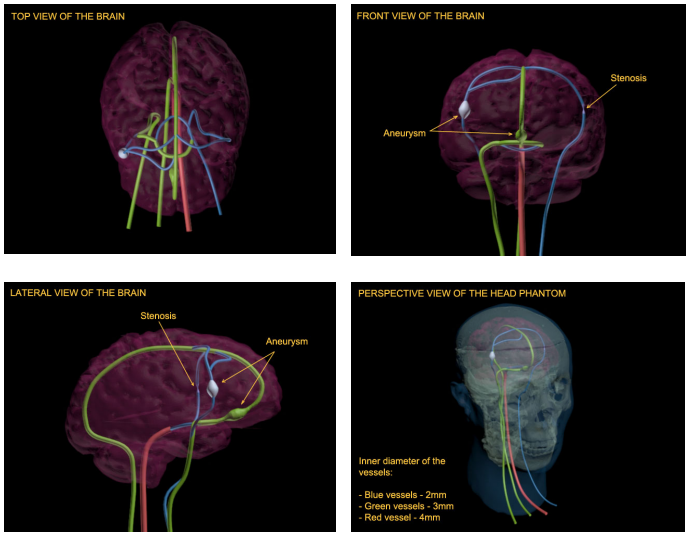
It can be fabricated as a stand-alone product or implemented to the full skull and/or head.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HD-A02

Adult Head (Dynamic)



Dynamic Adult Human Head Phantom is designed to be suitable for medical imaging of blood flow underneath the skull. The phantom is designed based on an average anatomy of a human male head and it is made out of realistic soft and hard tissue mimicking materials suitable for Ultrasound, MRI and CT applications.

The phantom consists of following components:

- Anatomically correct realistic skull
- Realistic brain phantom
- Complex blood vessel structure with incorporated Circle of Willis
- One bifurcation
- One stenosis
- Two aneurysms

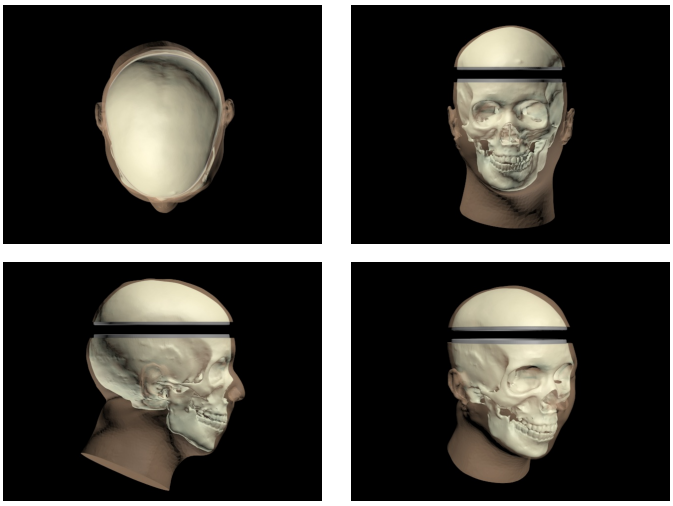
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissue	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2
Brain matter	1400 ± 10	0.99	20	70	YES	1.0 ± 0.2
Skin tissue	1400 ± 10	1.02	60	50	NO	1.7 ± 0.2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HD-C02

Adult Head (Openable)



The Openable Head Phantom for Ultrasound, MRI and CT was first fabricated based on the unique requirements of IIT Madras in the year 2017. Then later, we improved the accessibility and functionalities of this product with our technology and experience. Different brains can be inserted in and out to serve the purpose of many different research projects. The phantom is suitable for medical imaging applications (both static and dynamic), nuclear medicine and other CT applications. It can also be customized for training medical students and practitioners. We hold the strength and technology to customize them for meeting your needs. If you are research student or a scientist with medical imaging project. This is your optimal choice.

The following are the components of this product:

- Anatomically correct complete openable skull phantom (included)
- Openable Calvaria (included)
- Surrounding, acoustically correct skin-mimicking material which covers the skull (included)
- Anatomically correct brain phantom (optional)

The design of this phantom is based on an average human male head and it is made out of several realistic tissues mimicking materials that are suitable for Ultrasound, MRI and CT applications.

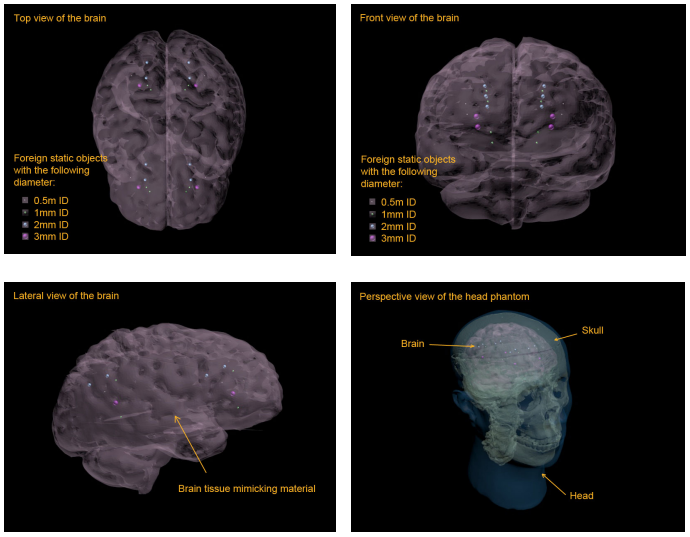
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissue	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2
Skin tissue	1400 ± 10	1.02	60	50	NO	1.7 ± 0.2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HD-A01

Adult Head (Static)



Static Adult Human Head Phantom is designed to be suitable for medical imaging of foreign static objects such as small bone pieces, shrapnel, bullets and any other metal or non-metal targets. The phantom is designed based on an average anatomy of a human male head and it is made out of realistic soft and hard tissue mimicking materials suitable for Ultrasound, MRI and CT applications.

The phantom consists of following components:

- Anatomically correct realistic skull
- Realistic brain phantom
- Set of small static objects (bone and metal pieces with the following diameters: 0.5mm, 1mm, 2mm and 3mm)

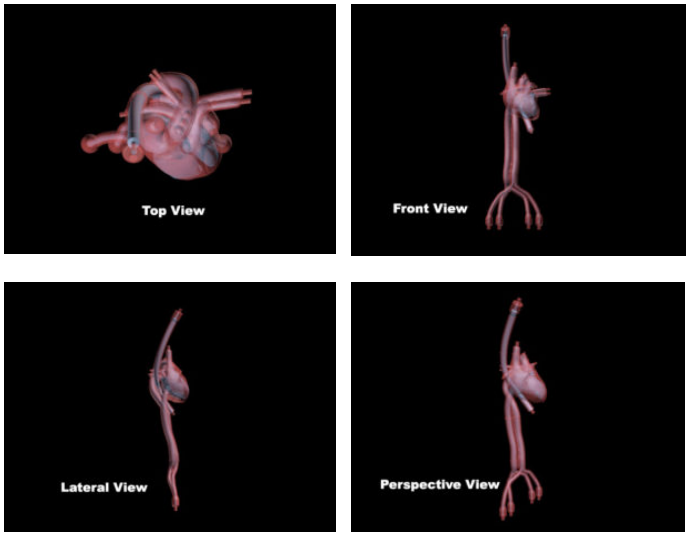
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissue	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2
Brain matter	1400 ± 10	0.99	20	70	YES	1.0 ± 0.2
Skin tissue	1400 ± 10	1.02	60	50	NO	1.7 ± 0.2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HT-A01

Adult Heart (Red)



Adult heart for multipurpose is a realistic artificial human heart that is majorly used by hospitals, researchers and medical schools for research & development as well as to train medical students and residents with various medical practices. Our heart model is compatible with endoscopic, ultrasound, MRI, CT and various medical imaging technologies.

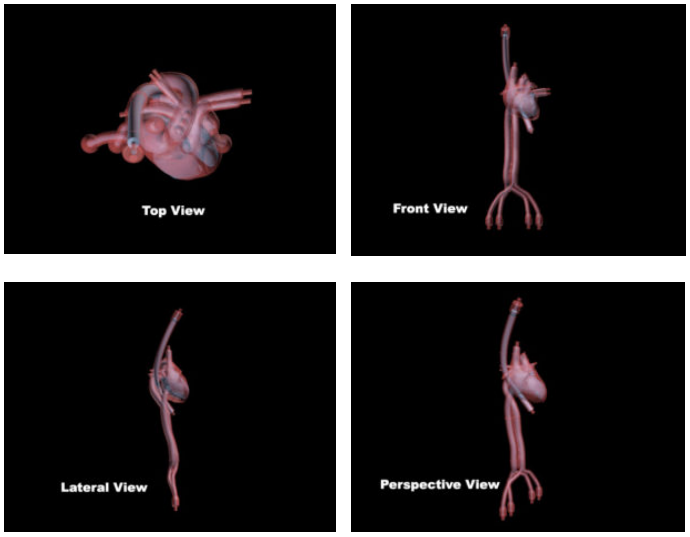
The picture represents the phantom/model without water tank. An optional water tank helps researchers in obtaining an enhanced view of the internal structure of the heart. The chambers and vessels are anatomically correct.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Heart Tissue	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

HT-A02

Adult Heart (Transparent)



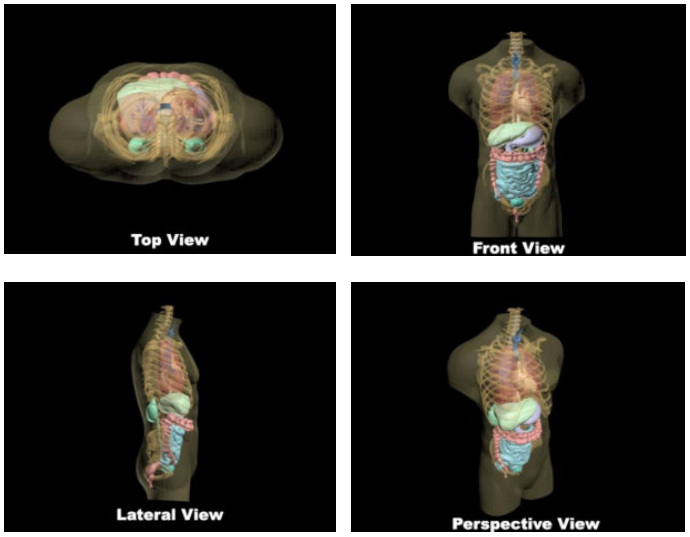
Adult heart for multipurpose is a realistic artificial human heart that is majorly used by hospitals, researchers and medical schools for research & development as well as to train medical students and residents with various medical practices. Our transparent heart model is compatible with endoscopic equipment and it is used whenever the optical transparency is crucial for research and training purposes.

The picture represents the phantom/model without water tank. An optional water tank helps researchers in obtaining an enhanced view of the internal structure of the heart. The chambers and vessels are anatomically correct.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

TO-A01

Adult Human Torso (R&D)



Adult Human Torso is a lifelike anatomically correct phantom, from neck to pelvic area with all the organs present inside. The phantom can be specifically customized to be compatible with Ultrasound, MRI and/or CT imaging methods.

It is a perfect model for carrying out research and development projects.

This product has a wide variety of medical imaging applications. It can be customized to different pathologies as well as for specific training applications.

What's Inside the model:

- Heart
- Lungs
- Liver
- Stomach
- Diaphragm
- Spleen
- Pancreas
- Kidney
- Vena cava
- Esophagus tube
- Aorta
- Psoas Major
- Colon
- Bladder
- Large intestine
- Small intestine
- Pelvic
- Ribcage
- Spine

(These organs can be added or removed to suit your application's requirements)

Optional features (based upon request)

Internal hemorrhages at bilateral chambers, pelvic area, pericardial area, perisplenic areas etc.
Lesions and tumors at precise locations.
Customizing the phantom with motion or bleeding.

Materials used:

Soft tissue and organs: Composition of urethane base soft resin

Synthetic bones: Patented ceramic-reinforced epoxy-based composite material (optional)

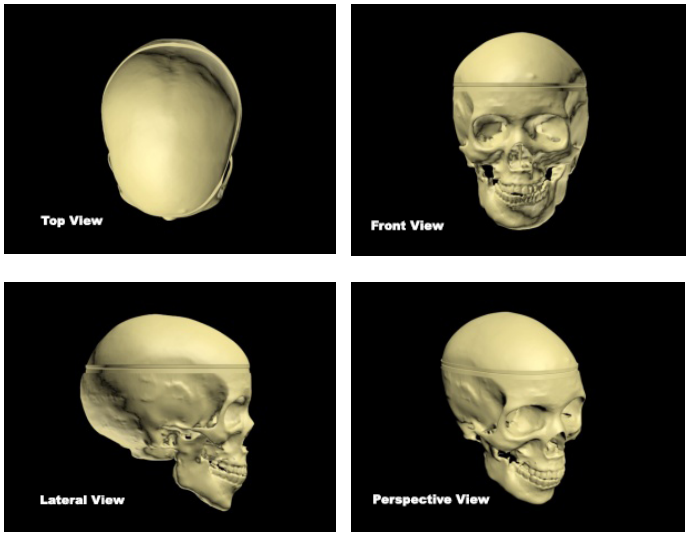
Dimensions and Weight:

Size: 85 x 32 x 32 cm (approx.) Weight: 40 kgs (approx.)

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

SL-A01

Adult Skull



Adult Human Skull Phantom can be used for medical imaging research and treatment planning of non-invasive HIFU brain surgeries. True Phantom Solutions are pioneers in developing these phantoms and hold strength in customizing them.

The design of this phantom is based on an average human male head and it is made out of realistic patented bone material that is suitable for Ultrasound, MRI and CT applications (any other part of the skull can be fabricated based on the customer order).

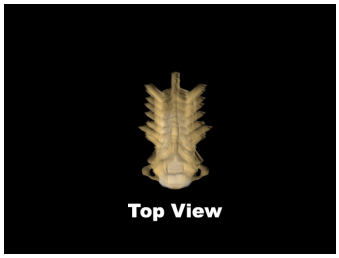
The phantom has a realistic three-layered structure and the inner porosity can be adjusted according to the requirement of the particular project.

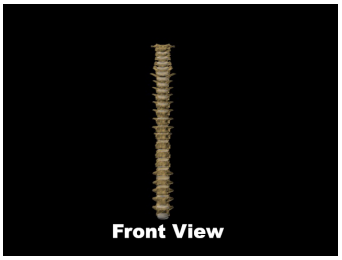
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

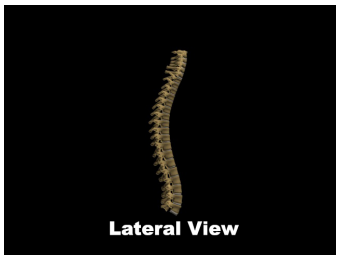
Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

Adult Spine







SE-A01

The Spine for R&D is made up of twelve vertebrae; labeled T1-T12 stacked one on top of each other.

The Phantom is designed based on an average human anatomy and it is made out of realistic patented bone material that is suitable for Ultrasound, MRI and CT applications. It can be used for medical imaging research and treatment planning of various medical procedures.

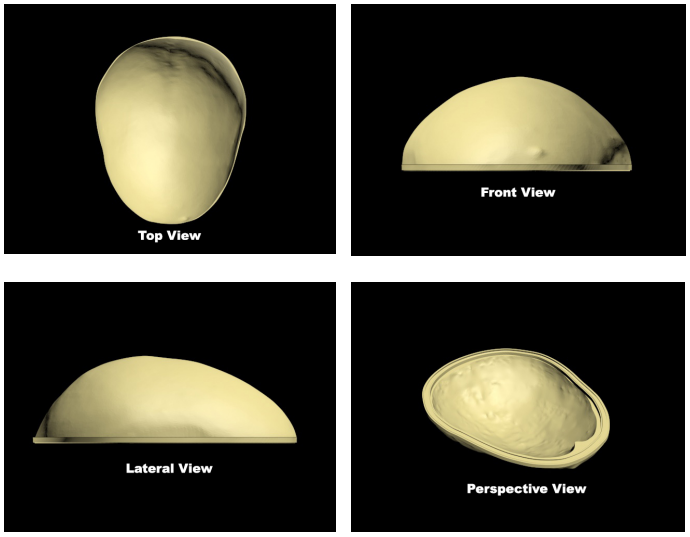
The vertebrae's have a realistic three-layered structure and the inner porosity can be adjusted according to the requirement of the particular project.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

Standard Calvaria



CA-A01

Standard Calvaria Phantom can be used for medical imaging research and treatment planning of non-invasive HIFU brain surgeries. True Phantom Solutions are pioneers in developing these phantoms and hold strength in customizing them.

The design of this phantom is based on an average human male skull and it is made out of realistic patented bone material that is suitable for Ultrasound, MRI and CT applications (any other part of the skull can be fabricated based on the customer order).

The phantom has a realistic three-layered structure and the inner porosity can be adjusted according to the requirement of the particular project.

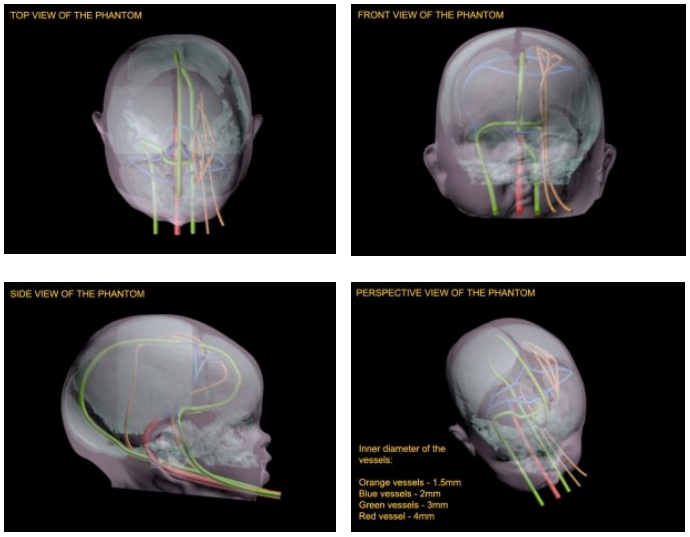
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	3000 ± 30	2.31	N/A	N/A	N/A	6.4 ± 0.3
Trabecular bone material used to fabricate the trabecular layer within the bone phantom	2800 ± 50	2.03	N/A	N/A	N/A	21 ± 2

Thermal Conductivity:	Volumetric Specific Heat Capacity:	Thermal Diffusivity:	Thermal Resistivity:	Specific Heat:	Speed of Sound:
0.776 W/ m K	1.040 MJ/ m^3 K	0.746 mm^2/ s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HD-N03

Newborn Head (Dynamic)



Dynamic Newborn Head

Anatomically Correct New Born Head Phantom

The phantom is designed to be suitable for medical imaging of blood flow underneath the skull. The phantom is designed based on an average new born head and it is made out of realistic soft and hard tissue mimicking materials suitable for Ultrasound, MRI and CT applications.

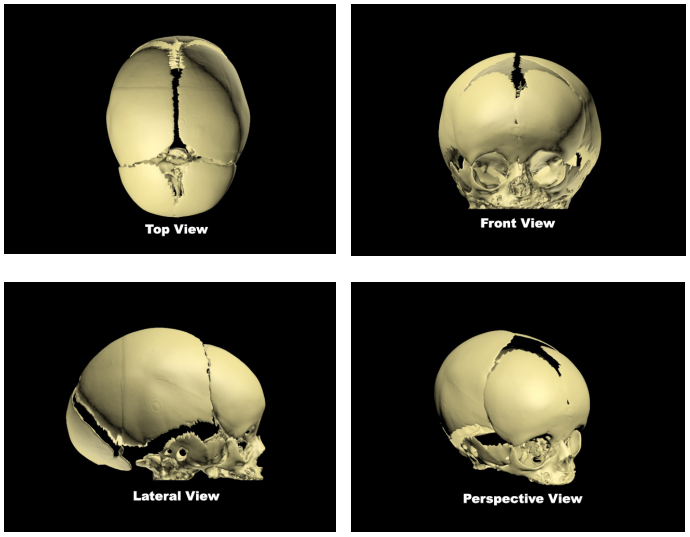
The phantom consists of following components:

- Anatomically correct realistic skull
- Skull filled with acoustically correct brain mimicking material
- Complex blood vessel structure with incorporated Circle of Willis
- One bifurcation
- Complex network of small vessels

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissue	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	2650 ± 30	2	N/A	N/A	N/A	7.8 ± 0.4
Brain matter	1400 ± 10	0.99	20	70	YES	1.0 ± 0.2
Skin tissue	1400 ± 10	1.02	60	50	NO	1.7 ± 0.2

Newborn Skull



SL-N01

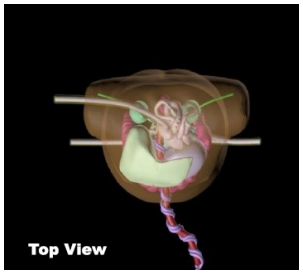
Newborn Human Skull Phantom can be used for medical imaging research and treatment planning of non-invasive HIFU brain surgeries. True Phantom Solutions are pioneers in developing these phantoms and hold strength in customizing them.

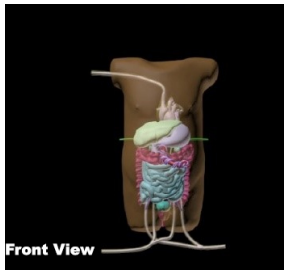
The design of this phantom is based on an average new born skull and it is made out of realistic patented bone material that is suitable for Ultrasound, MRI and CT applications (any other part of the skull can be fabricated based on the customer order).

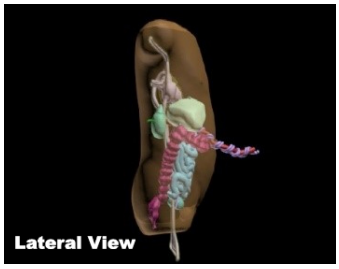
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissue	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Cortical bone material used to fabricate the skull bone phantom	2650 ± 30	2	N/A	N/A	N/A	7.8 ± 0.4

Newborn Torso (R&D)







AN-N01

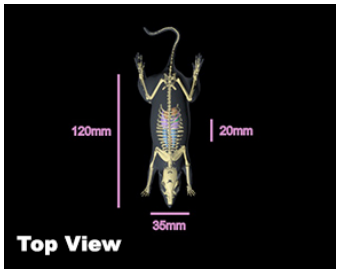
An anatomically correct Newborn Torso is designed based on an average new born anatomy and it is made out of realistic tissue mimicking materials suitable for both Ultrasound and MRI applications. It can be used for Medical Imaging and Training Purposes.

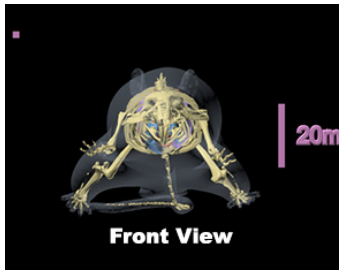
The phantom consists of the following features:

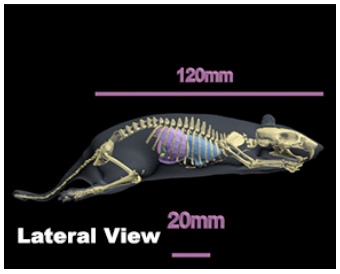
- Heart
- Liver
- Kidneys
- Stomach
- Small and Big Intestine
- Water Fillable Bladder
- Umbilical cord
- Realistic Body Tissue

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Rat Phantom (Anatomical)







RT-A01

Rat Phantom for R&D is an anatomically correct phantom of a mouse (rat) suitable for either X-Ray/Ultrasound/ MRI imaging methods and it can be customized to excel in selected imaging modality. It is a powerful tool which can be used for testing and calibration of various medical imaging devices.

The model shown on the images has the following internal structures:

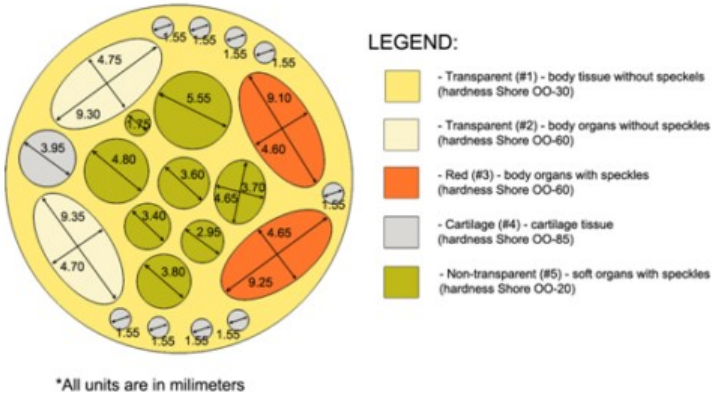
- Full skeleton
- Heart
- Lungs
- Diaphragm
- Liver
- Kidneys
- Pancreas
- Spleen

The phantom can be customized in size and shape.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of tissue phantom	Averaged HU value	Density [g/cm^3]	Hardness [Shore OO]
Soft Tissue	134	1.03	35
Bones	2397	2.31	N/A
Lungs	-908	N/A	N/A
Organs	83	1.01	35

Rat Phantom (Cylindrical)



RT-C01

Rat Phantom Cylindrical For R&D can be fabricated either as a simple cylinder or as an anatomically correct mouse (rat). Both phantoms are powerful tools which can be used for testing and calibration of various medical imaging devices.

The cylindrical version has 27mm diameter and 70mm height which correspond to the dimensions of small animals (i.e. a laboratory mouse.)

The small phantom is ultrasound, MRI and CT compatible and it can be customized in size and shape. The internal features can be also modified in terms of shape and properties to fit the needs of any particular bio-medical research project.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
(#1) – Transparent	1400 ± 10	1.01	30	N/A	NO	1.3 ± 0.2
(#2) – Transparent	1400 ± 10	1.03	60	N/A	NO	1.8 ± 0.2
(#3) – Red	1400 ± 10	1.04	60	N/A	YES	1.8 ± 0.2
(#4) – Cartilage	1850 ± 10	1.06	85	N/A	NO	30 ± 2
(#5) – Non-Transparent	1400 ± 10	1	20	N/A	YES	1.0 ± 0.2

Adult Brain (Customizable)

SKU: BN-C01

Customized Adult Brain for multipurpose

The brain phantoms are used for medical imaging (both static and flow) and for treatment planning for HIFU procedures. They can be also used for training medical students and practitioners. True Phantom Solutions are pioneers in developing these phantoms and hold strength in customizing them.

The design of this phantom is based on an average human male head and it is made out of several realistic tissues mimicking materials that are suitable for Ultrasound, MRI and CT applications.

Based on the requirements of your project, you can select any of the following features or a combination of them.

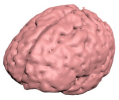
- Grey Matter Cerebrum
- White Matter Cerebrum
- Aneurysm/Stenosis feature
- Brain ventricles feature
- Epidural feature
- Tumor feature
- Bifurcation feature
- Blood vessels feature
- Foreign objects feature

Aneurysm

AM-A01

Bifurcation

BI-A01

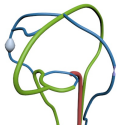


Brain Perenchyma

SB-A01

Brain Ventricles

VE-A01

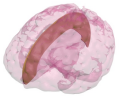


Brain Vessels

CW-C01

Complex Blood Vessel

VS-C02

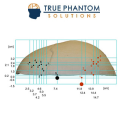


Falx Cerebri

FX-A01

Head Skin

SF-H01



Foreign Objects

FO-C01

Hematoma

HA-A01

Simple Blood Vessels

VS-A01

Stenosis

SS-A01

Tumor

TR-C01

White Matter

WM-A01

Adult Head (Customizable)

SKU: HD-C01

Head Phantoms are used for medical imaging (both static and flow) and for treatment planning for HIFU procedures. They can be also used for training medical students and practitioners. True Phantom Solutions are pioneers in developing these phantoms and hold strength in customizing them.

The design of this phantom is based on an average human male head and it is made out of several realistic tissues mimicking materials that are suitable for Ultrasound, MRI and CT applications.

Based on the requirements of your project, you can select any of the following features or a combination of them.

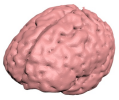
- Grey Matter Cerebrum
- White Matter Cerebrum
- Aneurysm/Stenosis feature
- Brain ventricles feature
- Epidural feature
- Tumor feature
- Bifurcation feature
- Blood vessels feature
- Skull/Calvaria feature
- Foreign objects feature

Aneurysm

AM-A01

Bifurcation

BI-A01

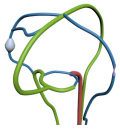


Brain Parenchyma

SB-A01

Brain Ventricles

VE-A01

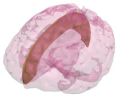


Brain Vessels

CW-C01

Complex Blood Vessel

VS-C02

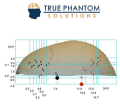


Falx Cerebri

FX-A01

Head Skin

SF-H01



Foreign Objects

FO-C01

Hematoma

HA-A01

Simple Blood Vessels

VS-A01

Stenosis

SS-A01

Tumor

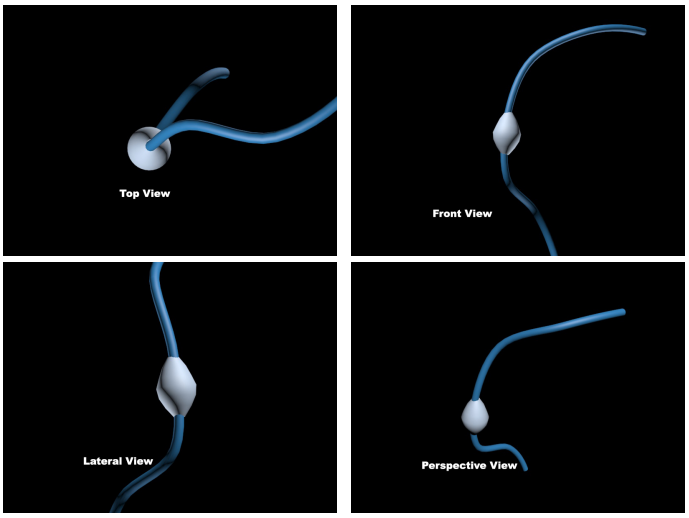
TR-C01

White Matter

WM-A01

Aneurysm

AM-A01



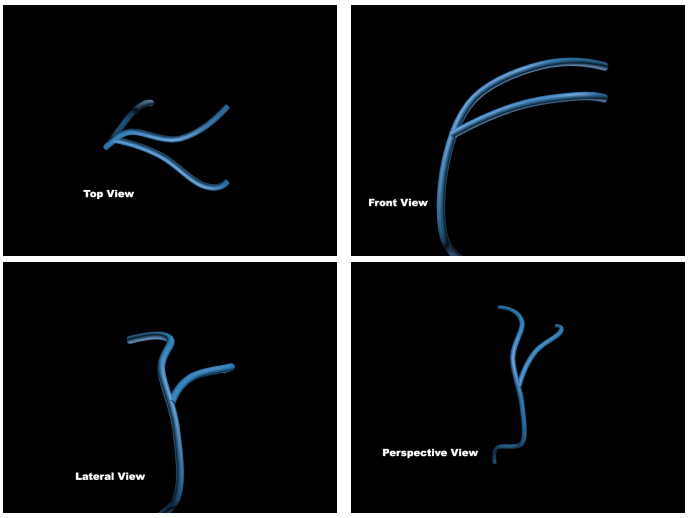
Aneurysm for R&D is an example of a feature which can be implemented to any location in the brain and/or blood vessels. The features shown on the image is made out of our proprietary blood vessel mimicking material with realistic acoustical and MRI properties.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Bifurcation

BI-A01



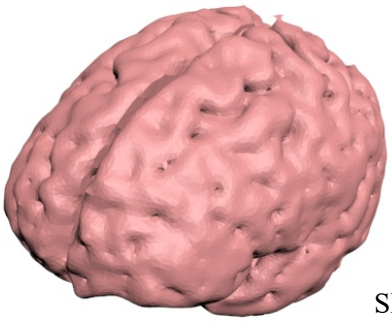
Bifurcation for R&D is a feature which can be implemented to any location of the brain/blood vessels or simply submerged in a brain mimicking material used to fill the skull or head phantom.

The features shown on the image is made out of our proprietary blood vessel mimicking material with realistic acoustical and MRI properties.

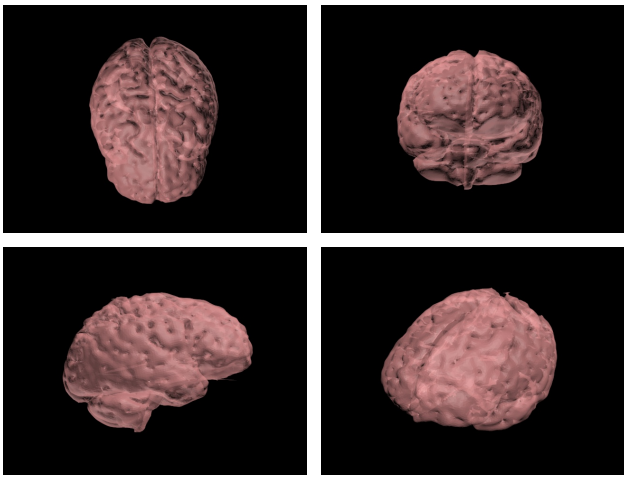
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Brain Parenchyma



SB-A01



The brain structure is created based on an average anatomy and dimensions of an adult brain. The parenchyma is be made out of a homogenous material with customizable composition to suit the need of various biomedical projects.

True Phantom Solutions are pioneers in developing brain phantoms for ultrasound, MRI and CT and hold strength in customizing them.

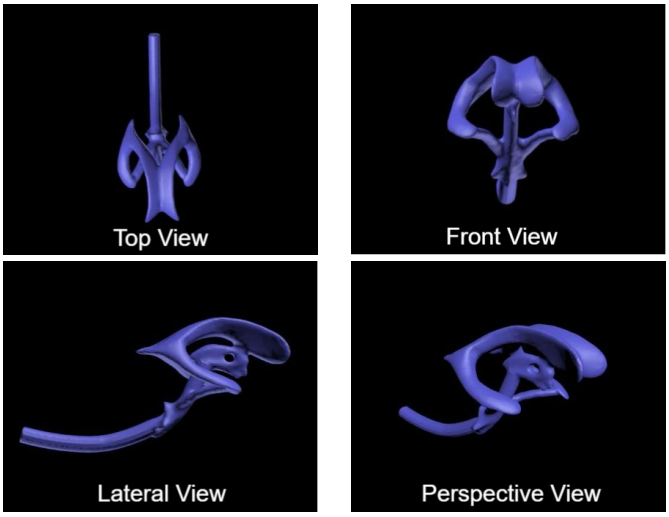
The size, dimensions and shape can fully customized based on the needs of your project.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Grey Matter	1400 ± 10	0.99	20	70	VARIABLE	1.0 ± 0.2

VE-A01

Brain Ventricles



Brain Ventricles for R&D are designed based on an average anatomy of human brain ventricles and they are fabricated using a novel 3D printing technology.

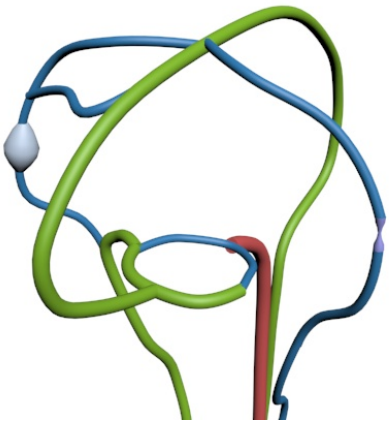
They can be implemented in the phantom in two version:

1) As an empty cavity fillable with water to mimic cerebrospinal fluid and change of pressure inside of the brain.
2) As a feature made out of water-like material suitable for imaging purposes only.

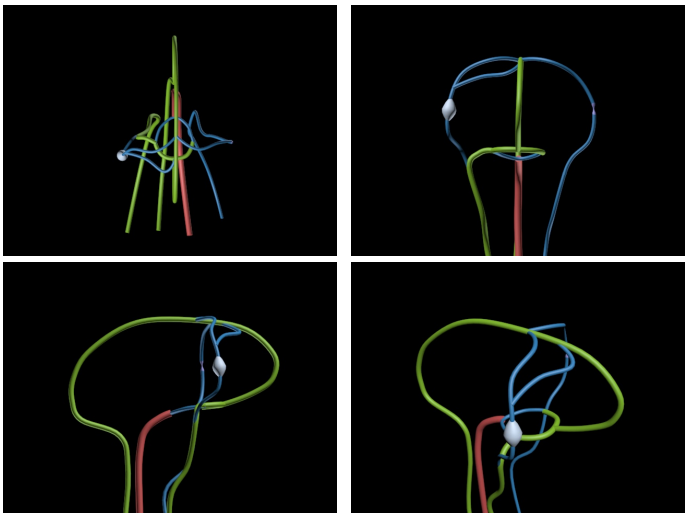
Upon special request, the size and geometry of the feature and the properties of the used tissue mimicking materials can be customized based on the requirements of any particular project.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Brain Vessels



CW-C01



Brain blood vessel feature is designed based on the arterial brain vessels and it is made out of realistic tissue mimicking material suitable for Ultrasound, MRI and CT applications.

The feature consists of following components:

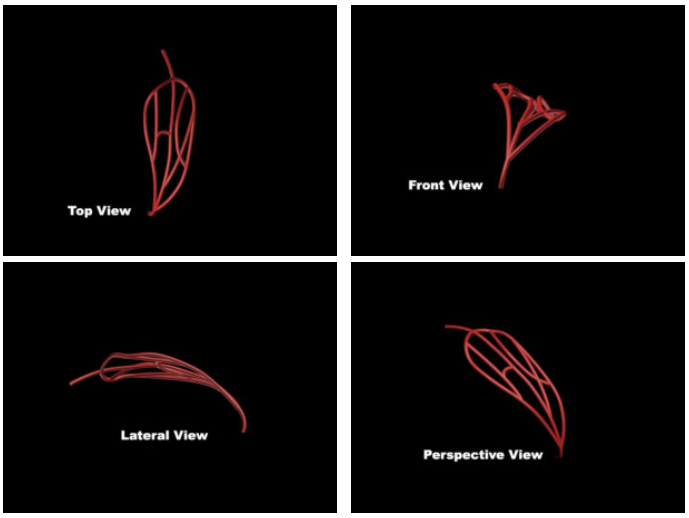
- Circle of Willis
- One bifurcation
- One stenosis
- Two aneurysms
- Connecting vessels with the neck
- Plastic connectors

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Complex Blood Vessel

VS-C02

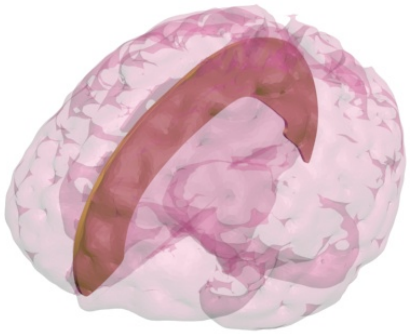


Complex Blood Vessels for R&D is a feature which can be implemented to any location of the brain or simply sub-merged in a brain mimicking material used to fill the skull or head phantom. The vessels network shown on the image is made out of our proprietary blood vessel mimicking material with realistic acoustical and MRI properties.

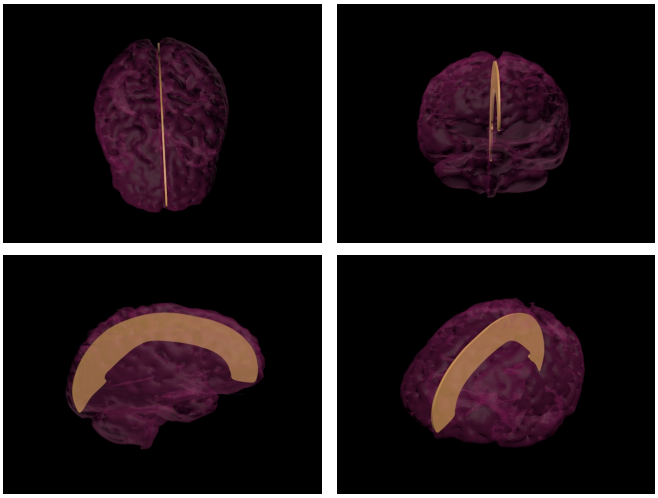
PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Falx Cerebri



FX-A01



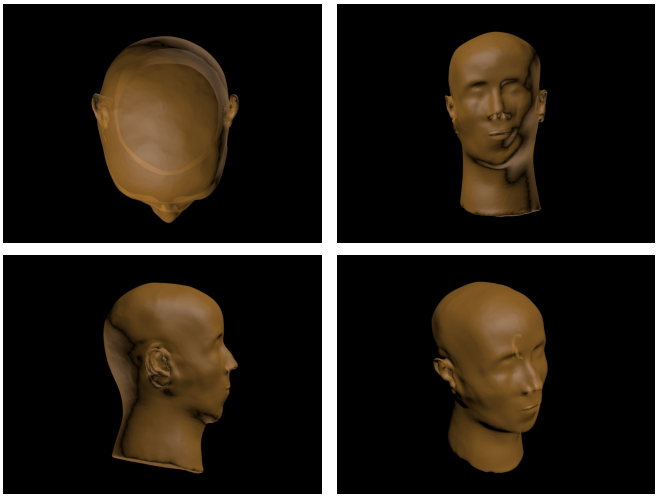
Falx Cerebri is a membrane which divides left and right brain hemispheres and it is designed based on an average anatomy of an adult human brain. This feature is a perfect navigation point for medical brain imaging and it is made from a realistic material suitable for ultrasound and MRI applications. Upon request, the feature can be also customized for X-Ray CT applications.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Falx tissue	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

SF-H01

Head Skin

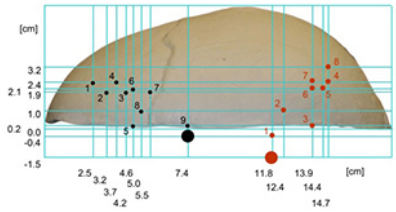


Head skin is designed based on average anatomy of and adult human head. It is made from realistic tissue mimicking material suitable for Ultrasound, MRI and CT applications. The skin can be implemented on top of the skull or brain based on the requirements of any research project.
The head stand on its own and it does not require any extra support.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Skin tissue	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Foreign Objects



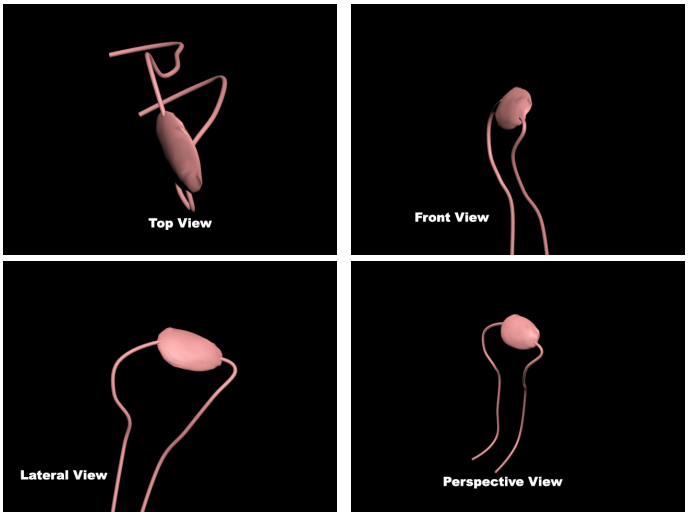
FO-C01

Foreign Objects for R&D Various foreign object can be incorporated within the skull directly in to the brain tissue or to any other location of the phantom. The objects can mimic different materials such as bullets, shrapnel and pieces of bones.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Hematoma

HA-A01



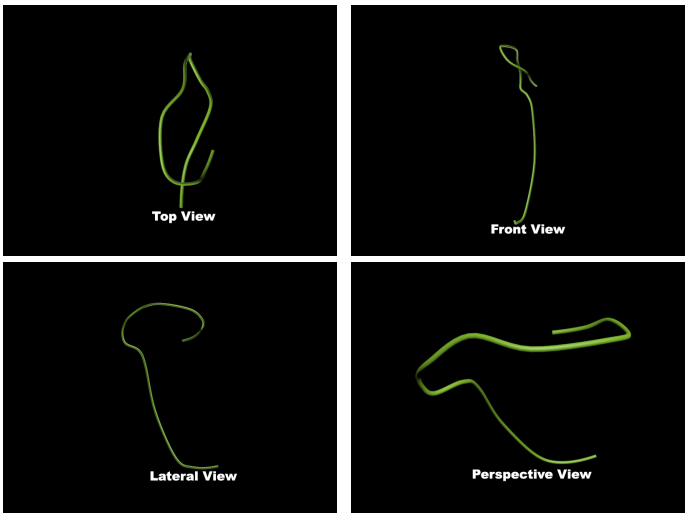
Hematoma for R&D or Epidural aneurysm is an example of feature which could be implemented to the head or brain phantom at any location. The feature is made out of realistic tissue mimicking material suitable for Ultrasound, MRI and CT applications and it is fillable with water or most blood mimicking fluids.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Prefilled hematoma	1400 ± 10	0.99	20	70	NO	1.0 ± 0.2

Simple Blood Vessels

VS-A01



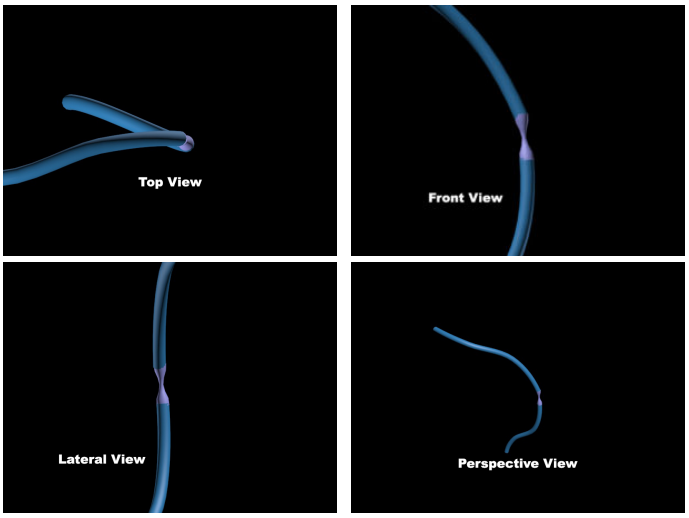
Blood Vessels for R&D can be fabricated as a stand alone phantom or a feature implemented to any location of the brain. They can be also simply submerged in a brain mimicking material used to fill the skull and/or head phantom. The vessels shown on the image are made out of our proprietary blood vessel mimicking material with realistic acoustical and MRI properties the inner diameters of the standard vessels are 2 and 3 mm.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Stenosis

SS-A01



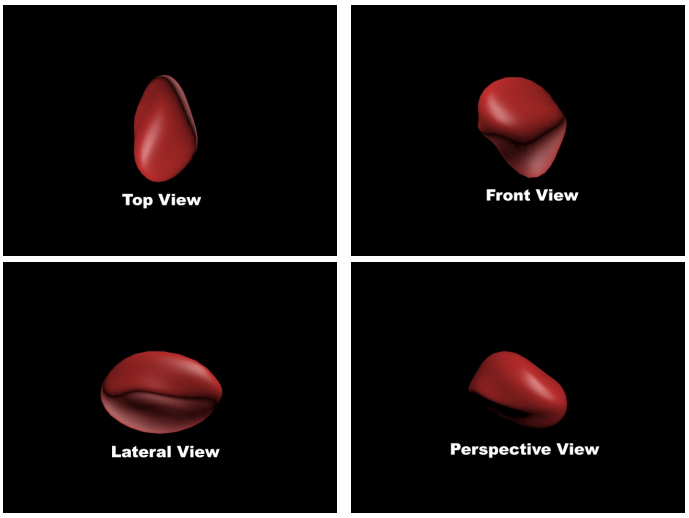
Stenosis for R&D is an example of a feature which can be implemented to any location in the brain and/or blood vessels. The features shown on the image is made out of our proprietary blood vessel mimicking material with realistic acoustical and MRI properties.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
Outer layer	1400 ± 10	1.02	60	50	YES	1.7 ± 0.2

Tumor

TR-C01

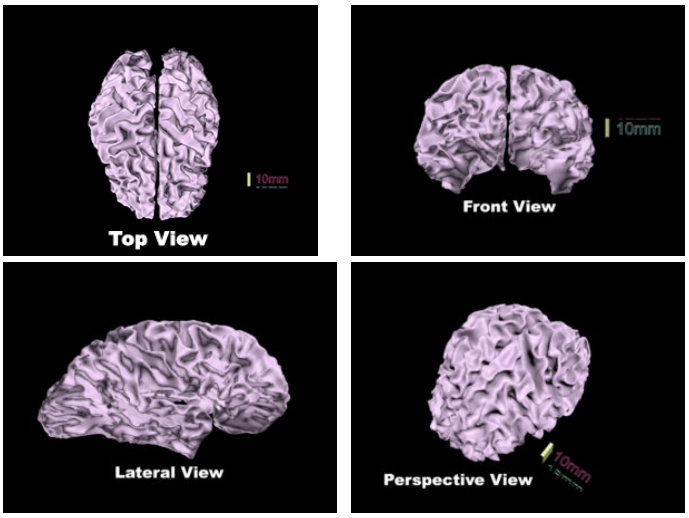


Tumor for R&D is a perfect example of a feature which can be implemented to any location of the brain or simply submerged in a brain mimicking material used to fill the skull or head phantom. The features shown on the images are made out of homogenous tissue mimicking material with realistic acoustical and MRI properties.

PLEASE NOTE: WE CAN CUSTOMIZE THIS PRODUCT BASED ON YOUR REQUIREMENTS

White Matter

WM-A01



White Matter is designed based on an average brain anatomy and it is made out of realistic tissue mimicking materials suitable for both Ultrasound and MRI applications. The feature can be incorporated to the brain phantom or simply submerged in a brain mimicking material used to fill the skull or head.

Upon special request, the geometry and dimensions of feature and its properties can be customized based on the requirements of any particular project.

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Type of the tissues:	Sound velocity [m/s]	Density [g/cm³]	Hardness [Shore 00]	T2 [ms]	Speckles	Attenuation measured at 2.25 MHz [dB/cm]
White Matter	1400 ± 10	1.01	35	60	YES	1.3 ± 0.2

TRUE PHANTOM
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True Phantom Solutions提供了一种新技术，用于制造具有逼真的物理和机械特性（类似于真实的人体组织和骨骼）的独特材料。

该公司自己研发的世界上唯一材料，其功能可以根据买方的研究或教育需求量身定制，以模仿健康的人体骨骼和不健康的人体骨骼。高度逼真的拟人化体模是在应用新的无创外科HIFU程序之前测试和校准新医疗设备，学生教育，治疗计划和针对性的有力工具。

True Phantom团队经验丰富，知识渊博，可提供高质量的产品以及建议和支持，以确保您的客户对其产品完全满意。

我司与加拿大True Phantom团队签署合作协议，正式开启模体定制解决方案，为国内各大科研院所和高校提供定制化服务！