



Phantoms

Imaging Solutions' Training and QA Phantoms are designed to help healthcare professionals maintain high-quality imaging standards by providing a realistic and consistent environment for training and quality assurance testing. Our phantoms allow for the regular monitoring and evaluation of imaging equipment to ensure accurate and consistent results.

your single source supplier™





Trusted provider to medical imaging professionals since 2000

Imaging Solutions is celebrating over 25 years as a trusted provider of market-leading medical imaging equipment and accessories. With an unwavering commitment to innovation, quality, and service, we continue to deliver cutting-edge solutions that empower healthcare professionals worldwide.

25
years

your single source supplier™

Table of Contents

Kyoto Kagaku	6
Diagnostic Radiology	7
Quality Assurance	38
MRI Quality Assurance	49
Nuclear Medicine	51
Dosimetry and Radiotherapy	58
Ultrasound	60
Erler Zimmer	78
RSD Phantoms	84

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Comprehensive Range of Medical Imaging Phantoms for Education and Evaluation

The range of phantoms from Kyoto Kagaku, Erler Zimmer, PhantomLab, and RSD Phantoms is a comprehensive collection that serves various aspects of medical imaging and training.

Each of these companies brings a distinct approach to medical phantom design, from the use of real human skeletons for realistic imaging by Erler Zimmer to the modular, upgradeable designs of PhantomLab, and the customizable, broad-spectrum solutions offered by RSD Phantoms.



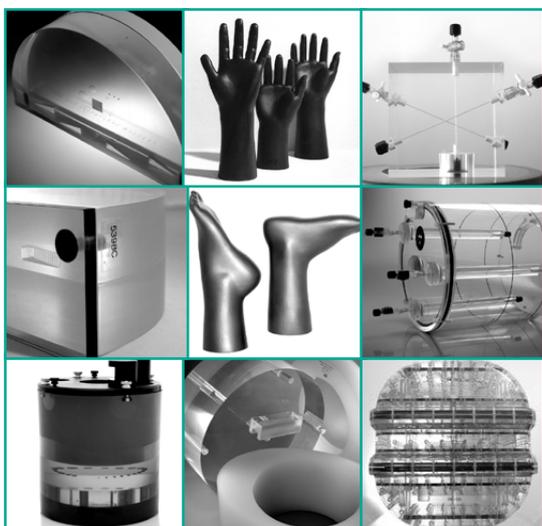
Kyoto Kagaku's PBU phantoms are revered for lifelike imaging, suited for both educational purposes and optimal scanning parameter evaluation, with models representing different life stages.



Erler Zimmer specializes in a unique full-body X-ray phantom with a real human skeleton, perfect for radiography training.



PhantomLab offers the Catphan® series, built on decades of research for comprehensive CT system evaluation with a modular, upgradeable design.



RSD Phantoms prides itself on customizable anthropomorphic phantoms, with a history of innovation since 1951, catering to the global medical community.





About Kyoto Kagaku

For optimal application of ultrasound in medicine

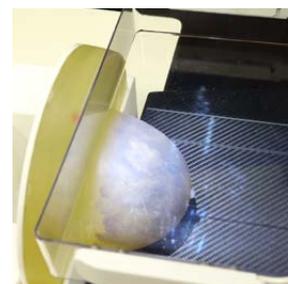
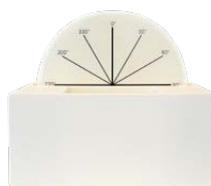
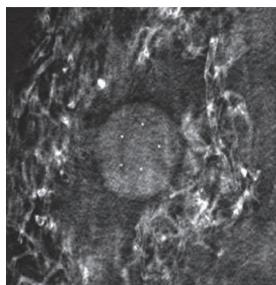
Kyoto Kagaku started preparing for coming age of medical ultrasound as early as turning of the century. At the beginning, there was two streams to pursuit: development of material for ultrasound phantom that is not only close to human tissue under ultrasound but also stable and long-life, construction of three-dimensional anatomical representation that facilitate improving interpretation skills of trainees. With the passage of time, application of ultrasound in medicine has developed and also the phantoms. Now Kyoto Kagaku phantoms cover the field of QA, training in examination and ultrasound guided procedures, and serving the range of health care specialties. Kyoto Kagaku ultrasound phantoms are presented at exhibitions such as RSNA, ECR, AIUM, SDMS and IMSH.



 **KYOTO KAGAKU co.,LTD**
Manufacturer and developer of educational models

Compressible Mammography Phantom Comp-AY

Allows for thorough visual evaluation under a variety of scanning conditions and image comparison of different modalities.



Features

- Soft and resilient material of the phantom allows breast compression for imaging.
- Three-dimensional structure of simulated mammary gland fibers and tumors to visualize realistic medical images.
- Allows for visual evaluation under different scanning conditions and locations of tumors
- Allows for image comparison of different modalities

Applications

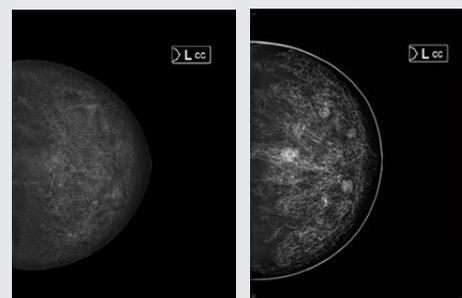
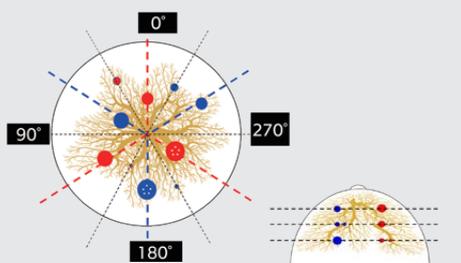
- Tomosynthesis
- Mammography
- Evaluation and study of effect of breast compression on image quality
- Patient Positioning

Anatomy and Pathologies

Simulated targets: 2, 4, 6, 8, 10mm dia.
 Calcifications: 0.3mm dia. x 5 in each 10mm dia. target

- high density
- low density
- ⊗ target with calcifications
- 🌿 mammary gland

Angle gauge on the back of the phantom for reproducible setting as well as to simulate a variety of patient cases.



tomosynthesis (DBT) mammography(2D)

Set Includes

- | | |
|-------------------------------------|---------------------------------|
| 1 newborn whole body phantom | 1 insert for the dosimeter hole |
| 1 set of sample CT/X-ray data (DVD) | 1 manual |
| 1 storage case | |

Materials

polyurethane

Dimensions

Phantom size:
 base: 26 dia. x H3 cm,
 10.2 dia. x H1.2 in
 mamma: 14 dia. x H9 cm,
 5.5 dia. x H3.5 in

Phantom weight: 2.5kg, 5.5lb

Product Code

Compressible Mammography Phantom Comp-AY

KK1-PH-83-41956-000

Multipurpose Chest Phantom N1 “LUNGMAN”

PH-1 is used in a study by the FDA to create a database of CT scans with different scanners and protocols, as a resource for assessment of lung nodule size estimation method



Features

- Detailed three-dimensional pulmonary vessels including capillaries permits radiographs and CT of every plane
- Radiation absorption and HU number approximate to human body
- Simulated tumors and other targets can be attached in the lung fields
- Wide variety of uses in interpretation training, anatomical education, evaluation and assessment of devices and other research
- Arms-abducted position of the torso suits the CT

Applications

- CT
- Plain X-ray
- Radiographic interpretation

Anatomy

<p>Chest includes:</p> <ul style="list-style-type: none"> • main body: <ul style="list-style-type: none"> » synthetic bones are embedded • mediastinum: <ul style="list-style-type: none"> » heart, trachea » pulmonary vessels • abdomen (diaphragm) block: <ul style="list-style-type: none"> » no internal structure 	<p>Simulated tumors</p> <p>- 800 - 630 + 100</p> <p>1.2/ 1.0/ 0.8/ 0.5/ 0.3 cm 0.47/ 0.39/ 0.32/ 0.2/ 0.12 in</p>	<p>Simulated tumors in five-size and three-HU-number variations can be attached to arbitrary positions in the lung field.</p>
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Set Includes

1 chest torso	1 set of sample X-ray data (DVD)
15 simulated tumors (15 variations 1 piece each)	1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)
 Synthetic bone: epoxy resin (density: 1.31)
 *Phantom has no metal parts or liquid structure

Dimensions

Phantom size	Phantom weight	Packing size	Packing weight
W43×D20×H48 cm, chest girth 94 cm W17×D8×H18 in, chest girth 37 in	18 kg / 39.6 lb	W63×D50×H29 cm W24.8×D19.7×H11.4 in	25 kg / 55.1 lb

Product Codes

Multipurpose Chest Phantom N1	KK1-PH-1-41337-000
Chest plates	KK1-PH-1-41337-010
Storage case	KK1-PH-1-41363-020
Simulated tumors	KK1-PH-1-41337-070



Breast Plate for Chest Phantom N-1

Simulates the absorption rate of breasts during female chest X-ray and demonstrates the influence of the nipple on image quality



Features

- This plate can be attached to PH-1 to study radiation absorption of the breasts and its effect on image quality.

Applications

- CT
- Plain X-ray

Set Includes

1 breast plate

Materials

urethane based resin
(density: 1.06)

Dimensions

Phantom size:
base: 26 dia. x H3 cm,
10.2 dia. x H1.2 in

mamma:
14 dia. x H9 cm,
5.5 dia. x H3.5 in

Phantom weight: 2.5kg, 5.5lb

Product Code

Breast Plate for Chest Phantom N-1 KK1-PH-1-41337-090

Pneumonia Kit for N-1

Attachment for N-1 chest phantom to create true-to-life medical images of pneumonia



*The mediastinum and the pulmonary vessels are not included.

Product Code

Pneumonia Kit for N-1 KK1-PH-1-41337-080

Set Includes

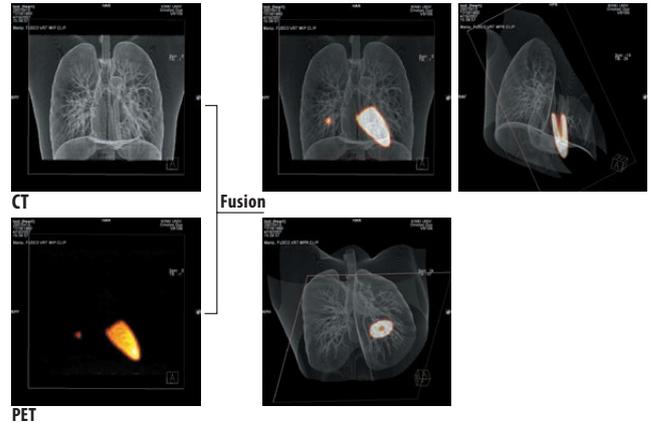
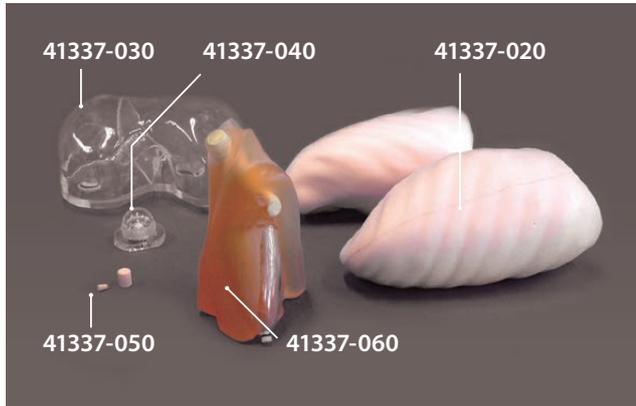
1 set of pneumonia attachments

Materials

polyurethane (density:0.92)

Components for Radioisotope

The set of RI container inserts can be set in the chest phantom in place of standard inserts, allowing for wider research applications such as PET/CT fusion evaluation



Product Codes

Lungs of urethane	KK1-PH-1-41337-020
Liver RI container	KK1-PH-1-41337-030
Gallbladder RI container	KK1-PH-1-41337-040
Pulmonary nodule RI container	KK1-PH-1-41337-050
Mediastinum with left myocardium RI cont.	KK1-PH-1-41337-060

Materials

Container: acrylic resin
 Liver: acrylic resin
 Heart: urethane based resin
 Lung and pulmonary nodule: urethane based resin

Subsolid Nodules Phantom

Both mixed and pure GGO are provided in a variety of sizes and HU numbers

Subsolid Nodules Phantom is a set of simulated lesions designed for study and training in Grand-Glass Opacity (GGO) detection and interpretation. Both mixed and pure GGO are provided in a variety of sizes and HU numbers. The set also includes 3-D GGO modeled on clinical CT data. The simulated lesions can be attached to the pulmonary vessels of the Chest Phantom N1 "LUNGMAN" or in the CT Lung Phantom.

41923-000 No.1-7 Concentric

ItemNo.	GGO field		Solid field		Type
	Diameter	HU	Diameter	HU	
1	1.5 cm 0.59 in	-650	0.5 cm / 0.20 in	-50	Concentric
2			0		
3			50		
4	2.0 cm 0.79 in	-650	0.3 cm / 0.12 in	0	
5			0.5 cm / 0.20 in		
6			0.7 cm / 0.28 in		
7			0.9 cm / 0.35 in		

41923-100 No.8-10 Eccentric

ItemNo.	GGO field		Solid field		Type
	Diameter	HU	Diameter	HU	
8	1.5 cm 0.59 in	-650	0.5 cm / 0.20 in	-50	Eccentric
9			0		
10			50		

41923-200 No.11-12 Eccentric

ItemNo.	GGO field		Solid field		Type
	Diameter	HU	Diameter	HU	
11	2.0 cm 0.79 in	-650	0.3 cm / 0.12 in	0	Eccentric
12			0.5 cm / 0.20 in		
			0.7 cm / 0.28 in	0	

41923-300 No. a-h Pure GGO

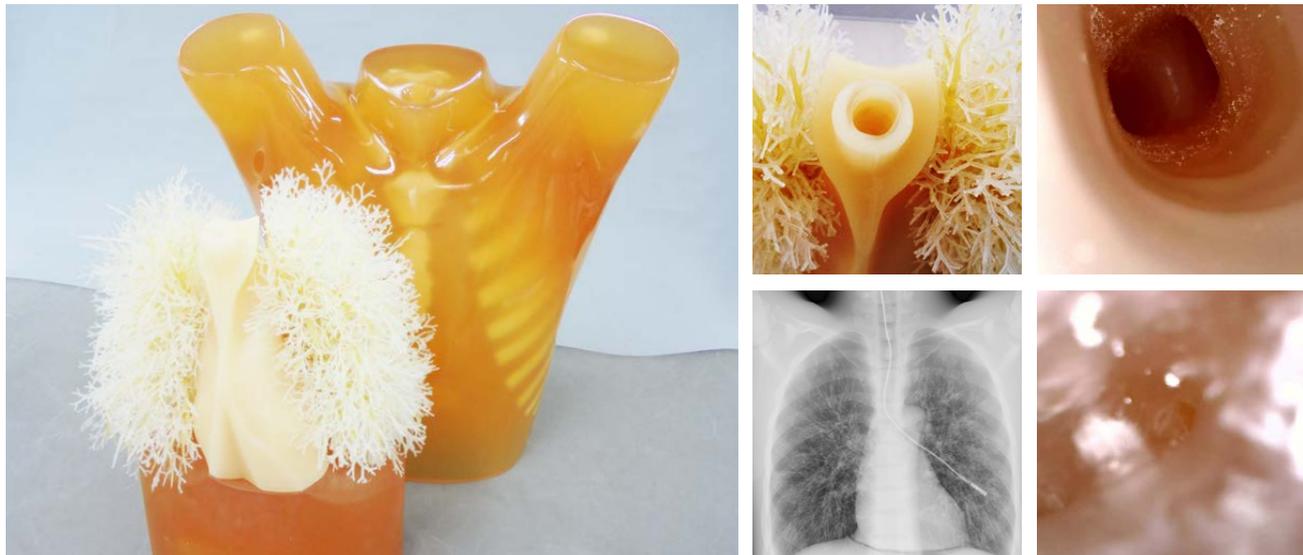
ItemNo.	GGO field		Solid field		Type
	Diameter	HU	Diameter	HU	
a	1.5 cm 0.59 in	-750	-	-	Pure GG
b		-650	-	-	
c		-550	-	-	
d		-450	-	-	
e		-350	-	-	
f		-250	-	-	
g		-150	-	-	
h		-50	-	-	

41923-400 3D GGO

ItemNo.	GGO field		Solid field		Type
	Diameter	HU	Diameter	HU	
3D-GGO	1.5x1.5 cm 0.59x0.59 in	-550	-	-	-

Bronchoscopy-compatible N-1 Lungman with Pulmonary Vessels

Lungman phantom with an open bronchus for bronchoscope



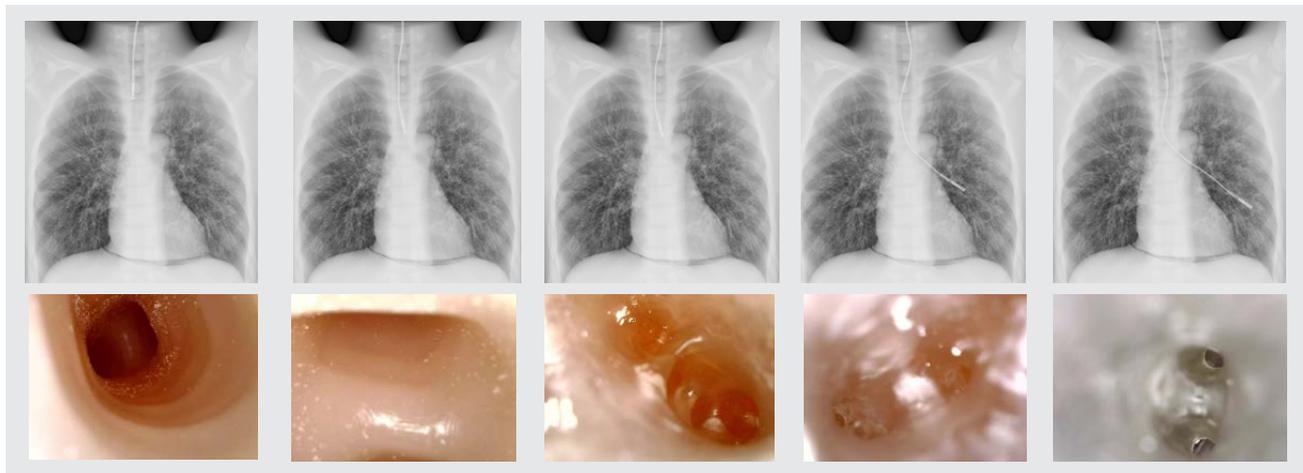
Features

- Close to human medical images under X-ray, CT, and fluoroscopy
- The trachea and bronchi are hollow so that the bronchoscope can be passed into the airway up to the 4th~5th branches.
- Optional chest plates to simulate X-ray absorption of a larger body type.

Applications

- CT
- Plain X-ray
- Fluoroscopy

Radiograph and Bronchoscopic View



Dimensions

Phantom size:
W43×D20×H48 cm,
hest girth 94 cm
W17×D8×H18 in,
chest girth 37 in

Phantom weight:
18 kg / 39.6 lb

Phantom size:
W63×D50×H29 cm
W24.8×D19.7×H11.4 in

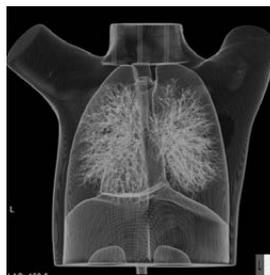
Packing weight:
25 kg / 55.1 lb

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)
*Phantom has no metal parts or liquid structure

Pediatric Chest Phantom

A phantom representing a five-year-old for practicing and performing imaging and dosimetry



Features

- Two types of interchangeable lung inserts are included - lung vascular insert and lung density insert
- Pencil-shaped ion chamber for CTDI can be set in the mediastinum
- TLD or RPL dosimeters can be set in the thyroid block and the lung density insert
- Detachable internal structure allows insertion of variety of pathologies and targets

Applications

- CT
- Plain X-ray
- Dosimetry
- Radiographic interpretation

Anatomy

Rib, clavicle, spine, mediastinum, scapula, sternum and *pulmonary vessel

*lung vascular insert only



TLD or RPL dosimeters can be set in the thyroid block

Set Includes

- 1 five-year-old chest torso
- 1 lung vasculature insert: mediastinum with pulmonary vessels
- 1 lung density insert: mediastinum, lung fields (L-R)**

- 1 set of sample images
- 1 storage case manual

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)
 *Phantom has no metal parts or liquid structure

Dimensions

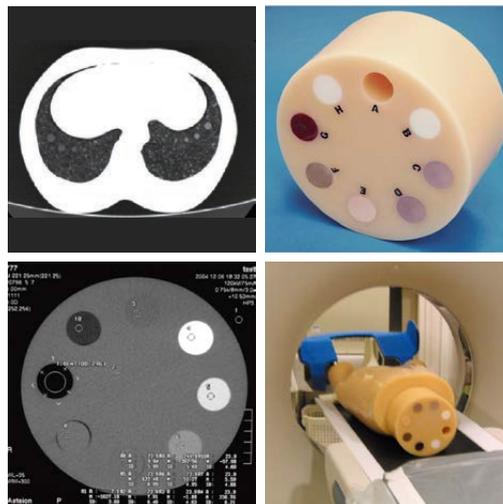
Phantom size	Packing size
W32×D17×H38 cm W12.6×D6.7×H15 in	W51×D43×H45 cm W20×D17×17.7 in
Phantom weight	Packing weight
6 kg / 13.3 lb	14 kg / 30 lb

Product Codes

Pediatric Chest Phantom - With Insert**	KK1-PH-1C-41337-300
Pediatric Chest Phantom	KK1-PH-1C-41337-400

Lung Cancer Screening CT Phantom

Chest phantom for standardization studies in low dose lung cancer CT screening Anthropomorphic structure provides life-like images



Features

- Simulated GGO type tumors with different sizes and HU numbers are prepared in the vicinity of three main sections of bilateral lungs
- Dosimeter holder on the central axis of the phantom allows housing a pencil-type ion chamber. 8-step cylindrical linearity phantom to control density curve as a scale can be attached to the chest phantom base

Applications

- CT image quality evaluation
- Dosimetry
- Evaluation of density curve

Anatomy

- Bones
- Lungs
- Mediastinum
- Simulated tumors at three lung areas:
 - » Apical portion of the lungs
 - » Bifurcation of the trachea
 - » Base of lungs

Simulated tumors

	HU contrast with the lung back ground	Size	Materials
tumors in the right lung	HU=100	4, 6, 8, 10, 12 mm dia. 0.16, 0.24, 0.32, 0.39, 0.47 in dia.	urethane resin
tumors in the left lung	HU=270	2, 4, 6, 8, 10 mm dia. 0.08, 0.16, 0.24, 0.32, 0.39 in dia.	urethane resin

Linearity phantom targets

	HU contrast with the lung back ground	Materials		HU contrast with the lung back ground	Materials
A	-1000	air	E	-200	polyurethane
B	-850	polyurethane	F	100	polyurethane
C	-600	polyurethane	G	250	Bakelite
D	-400	polyurethane	H	350	polyacetal resin

Set Includes

- | | |
|----------------------------|------------------------|
| 1 chest phantom | 1 adjustment base |
| 1 8 step linearity phantom | 1 set of sample images |
| 1 urethane cylinder | manual |

Materials

Chest wall: human tissue substitute
Bones: synthetic bones
Alveoli: styrene foam and urethane foam

Dimensions

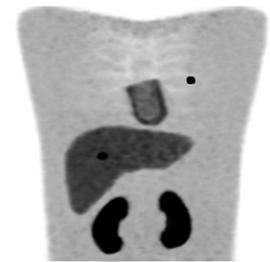
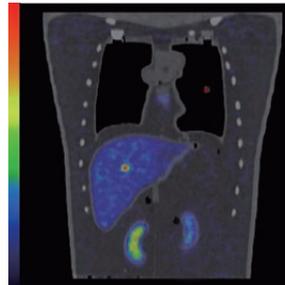
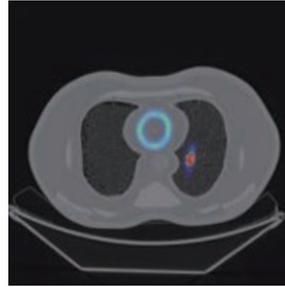
Phantom size:
 W44×H69.4 cm
 W17.3×H27.3 in

Product Codes

Lung Cancer Screening CT Phantom KK1-PH-8-41507-000

Thorax Phantom for RI

Thorax Phantom for RI is an optimal tool for study in nuclear medicine



Features

Examination of myocardial density through SPECT imaging

- Verification of myocardial imaging with the use of various RI solution densities
- Myocardial infarction can be depicted
- By filling RI solution into the lungs, liver and kidneys, the effect of these organs on the heart can be recreated.

Examination of RI solution density for simulated tumors

- The simulated tumors can be inserted into lung, liver and breast
- Tumors can be filled with FDG/RI solution into the spheres for evaluation of density, size and placement

Applications

- PET
- Quality management of NM equipment
- RI solution density for tumor imaging

Anatomy

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> • Liver • Lung (right/left) • Kidney (right/left) • Hot spots (liver, lungs and breast) | <ul style="list-style-type: none"> • Heart - Anatomical type:
right ventricle, left ventricle
and myocardium | <ul style="list-style-type: none"> - Geometric type:
left ventricle and
myocardium |
|--|--|---|

* Hot spot for PET can be set in liver, lungs and breast.

- Bone: 370HU
- Lung: -900HU
- Organ shell material: 100HU, and 1.16g/cm³ in density

Set Includes

1 thorax body	1 base
2 lungs (left and right)	6 plastic pins
4 hearts	6 supporting bars
1 liver	4 metal frame
2 kidneys (left and right)	1 silicon sealing gasket
1 rib cage and spine	3 tubes
2 breasts (left and right)	1 syringe
3 hot spots	12 nuts and bolts
2 aorta	1 water tank
1 beaker	1 Vaseline
	manual

Materials

Soft tissue: transparent polyurethane

Lungs: materials with density 0.4 g/cm³

Bone materials: Calcium-infused material to provide proper attenuation with use of RI solutions

Dimensions

Phantom size:
W44×H69.4 cm
W17.3×H27.3 in

Phantom weight:
phantom itself: 21 kg / 46.2 lb
when filled with liquid: 37.5 kg / 82.6 lb

Product Codes

Thorax Phantom for RI

KK1-PH-63-41927-000

Anthropomorphic Phantoms

Anthropomorphic phantoms provide life like images and attenuation. Ideal for educational training applications and help to determine and evaluate optimal scanning parameters.



	NEWBORN		CHILD (5-year-old)		ADULT	
	Standard	Variations	Standard	Variations	Standard	Variations
Plain X-ray	PH-50B: P.5	PH-50: P.5 PH-50 : P.5 Meconium aspiration syndrome* *Option	PH-2C : P.6 PBU-70	PH-2D : P.7 Bone fracture	PH-2B: P.8 PH-2: P.10 PH-60: P.11	PH-2E : P.9 with pathologies
CT						
Dosimetry						

The above matrix chart indicates the most recommended application/modality for use of each phantom and not necessarily means the phantom should exclusively be used with marked modalities.

All above phantoms can be imaged via both plain radiography (X-ray) and CT.

Differences in included organs or tissue substitute material provide some phantoms wider use in CT study/training than others.

Body size variations



Body Plates

41350-200-16 (BMI 32)/ 41350-200-17 (BMI 40)

For separate anatomy...



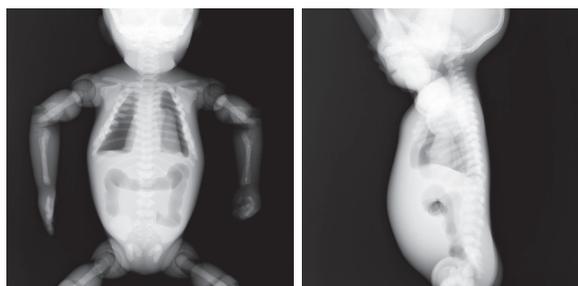
Sectional Phantom Series

PH-61 41926-000-



Newborn Whole Body Phantom “PBU-80”

Limbs with articulation for natural positioning



Features

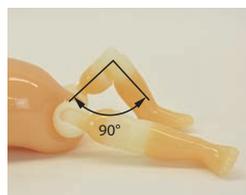
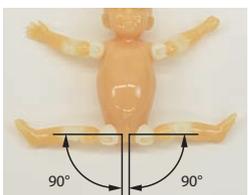
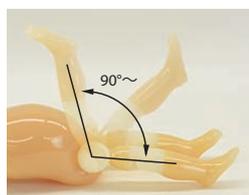
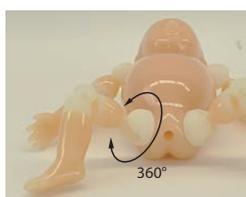
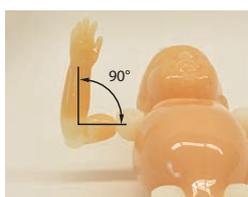
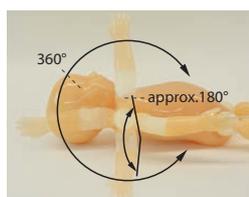
- Limbs rotate 360 degrees at shoulders and hip joints
- Left hand is clenched and right hand is open
- Kyoto Kagaku original human tissue substitute material
- A hole for an ion chamber
- HU of average newborn (HU 30)

Applications

- CT and plain X-ray
- Dosimetry
- Autopsy imaging
- Positioning: with / without a poser / upright AP / supine AP / upright lateral / supine lateral

Anatomy

skull / spine/ clavicles / scapulae / ribs / humerus / radius / ulnae / bones of hands / femora / tibiae / fibula /bones of foot / pelvis / lungs / mediastinum / colon



Set Includes

- 1 newborn whole body phantom
- 1 set of sample CT/X-ray data (DVD)
- 1 storage case

- 1 insert for the dosimeter hole
- 1 manual

Materials

Soft tissue: urethane based resin (density: 1.07)

Synthetic bone: epoxy resin (density: 1.31)

*Phantom has no metal parts or liquid structure

Dimensions

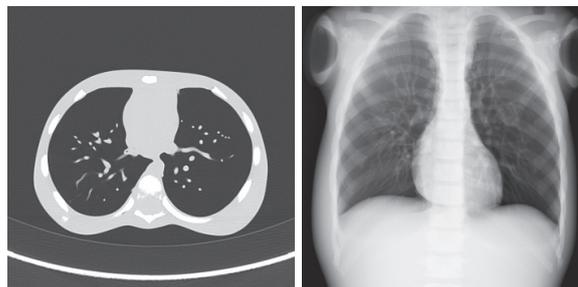
Phantom size	Phantom weight	Packing size	Packing weight
53 cm/ 20.8 in	3.5 kg / 7.7 lb	W57×D44×H29 cm / W22.4×D17.3×H11.4 in	8 kg / 17.6 lb

Product Code

Newborn Whole Body Phantom KK1-PH-50B-41912-100

Pediatric Whole Body Phantom “PBU-70”

This phantom representing a five-year-old child is easy to position, and provides complete bone images for every joint



Features

- Radiology absorption and HU number approximate to human body
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

Anatomy

Bony Structure

skull / spine/ clavicles / scapulae / ribs / sternum / coxal bones / humerus / antebrachial bone / bones of hand / femur / patella / lower leg bone / bones of foot

HU numbers of each organ:

liver 70
kidney 30

Internal organs

lung with pulmonary vessels / trachea (up to primary bronchi) / heart / liver with portal and hepatic veins

Position of Hands and feet

left foot : plantar flexion
right foot : dorsiflexion
left hand : aligned fingers
right hand : spread fingers

Set Includes

1 pediatric whole body phantom	1 screwdriver
1 head supporter	1 set of sample X-ray data (DVD)
1 hand fixture belt	1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Skull: epoxy resin (density: 1.11)

*Phantom has no metal parts or liquid structure

Dimensions

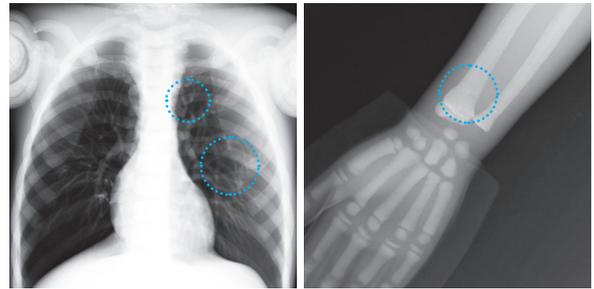
Phantom height	Phantom weight	Packing size	Packing weight
110 cm / 43.3 in	20 kg / 44 lb	W86×D60×H32 cm / W33.8×D23.6×H12.6 in	8 kg / 17.6 lb

Product Code

Pediatric Whole Body Phantom KK1-PH-2C-41350-300

Bone Fracture Pediatric Phantom “PBU-70B”

Improve skills in detecting bone fractures in children and cultivate awareness of child maltreatment



Features

- Training in pediatric radiography can be enriched with clear and subtle bone fractures
- Typical fractures resulting from child abuse are also included
- Radiology absorption and HU number approx to human body
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning
- Radiographic interpretation

Concept and Anatomy

Child maltreatment

Children around the world are victims to domestic violence and abuse, yet the problem is often overlooked. Noticing the signs of an abusive fracture of a child is the first step to putting an end to these maltreatments.

Signs of callus	A number of callus examples can be a result of abusive treatment. This particular model contains calluses in the wound healing phase 5.
Supracondylar humerus fracture	A supracondylar humerus fracture on the distal humerus above the epicondyles and is a fracture commonly observed in children, accounting for approximately 20%.
Spiral fracture	Certain causes of non-accidental pediatric injuries, such as spiral fractures, include maltreatment stimulated by anger or distress.
Back, scapula and rib fractures	Rib fractures close to the vertebrae may be potential indicators of the child being thrown.
Skull fractures	A linear skull fracture may be another indication of child maltreatment. At times, fractures display better on x-ray scans than CT imaging.

Set Includes

- | | |
|--------------------------------|----------------------------------|
| 1 pediatric whole body phantom | 1 screwdriver |
| 1 head supporter | 1 set of sample X-ray data (DVD) |
| 1 hand fixture belt | 1 manual |

Product Code

Pediatric Whole Body Phantom KK1-PH-2D-41350-500

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Skull: epoxy resin (density: 1.11)

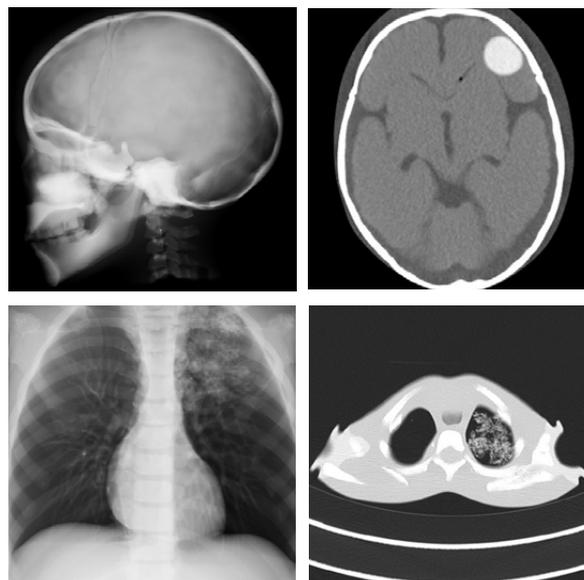
*Phantom has no metal parts or liquid structure

Dimensions

Phantom height	Phantom weight
110 cm / 43.3 in	20 kg / 44 lb
Packing size	Packing weight
W86×D60×H32 cm / W33.8×D23.6×H12.6 in	8 kg / 17.6 lb

CT Pediatric Whole Body with Pathologies

Whole body phantom including key pathologies for pediatrics such as pneumonia



Features

- Includes organs and key pathologies for pediatric patients
- Radiology absorption and HU number approximate to human body
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

Anatomy

Bony Structure

skull / spine/ clavicles / scapulae / ribs / sternum / coxal bones / humerus / antebrachial bone / bones of hand / femur / patella / lower leg bone / bones of foot

HU numbers of each organ:

liver 70
kidney 30

Internal organs

lung with pulmonary vessels / trachea (up to primary bronchi) / heart / liver with portal and hepatic veins

Position of Hands and feet

left foot : plantar flexion
right foot : dorsiflexion
left hand : aligned fingers
right hand : spread fingers

Set Includes

1 pediatric whole body phantom	1 screwdriver
1 head supporter	1 set of sample X-ray data (DVD)
1 hand fixture belt	1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Skull: epoxy resin (density: 1.11)

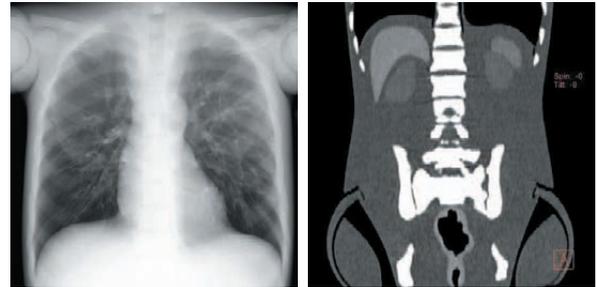
*Phantom has no metal parts or liquid structure

Dimensions

Phantom height	Phantom weight
110 cm / 43.3 in	20 kg / 44 lb
Packing size	Packing weight
W86×D60×H32 cm / W33.8×D23.6×H12.6 in	8 kg / 17.6 lb

CT Whole Body Phantom “PBU-60”

A unique, life size whole body phantom for CT provides a variety of educational application as well as visual evaluation in finding out optimal scanning conditions



Features

- Includes full internal organs with close-to-human HU for each.
- Radiology absorption and HU number approx. to human body
- Main joints have close-to human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

Anatomy

Full internal organs	Internal organs	HU number at 80KeV	Internal organs	HU number at 80KeV	
Bony Structure	Brain		Portal and hepatic veins	40	
	Synthetic skull	Cerebrum	40	Pancreas	30
	Cervical vertebrae	Mesencephalon	40	Kidneys	30
	Vertebrae	Cerebellum	40	Gallbladder	20
	Clavicles	Cerebral ventricles	10	Spleen	50
	Ribs	Eye balls	20	Seminal vesicle	25
	Sternum	Arteries with contrast medium (left half only)	250	Aorta	40
	Scapula	Lungs	-1000	Cava	70
	Coxal bones	Pulmonary vessels	8	Ureter	ureteral wall: 30 / inside: 10
	Femurs	Trachea	trachea wall: 8 / inside: -1000	Urinary bladder	10
		Heart	PBU-50: 8 / PBU-60: 40	Prostate	50
		Liver	70	Rectum	rectum wall: 70 / inside: -800
				Sigmoid Colon	colon wall: 70 / inside: -800

Set Includes

- | | |
|-------------------------|----------------------------------|
| 1 whole body phantom | 1 hand-fixture belt |
| 1 head supporter | 1 set of sample X-ray data (DVD) |
| 1 flat head screwdriver | 1 manual |

Dimensions

Phantom height
165 cm / 65 in
Phantom weight
50 kg / 110 lb

Packing weight
80 kg / 176 lb

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Skull: epoxy resin (density: 1.11)

*Phantom has no metal parts or liquid structure

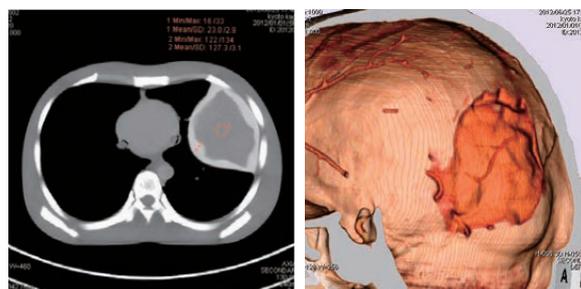
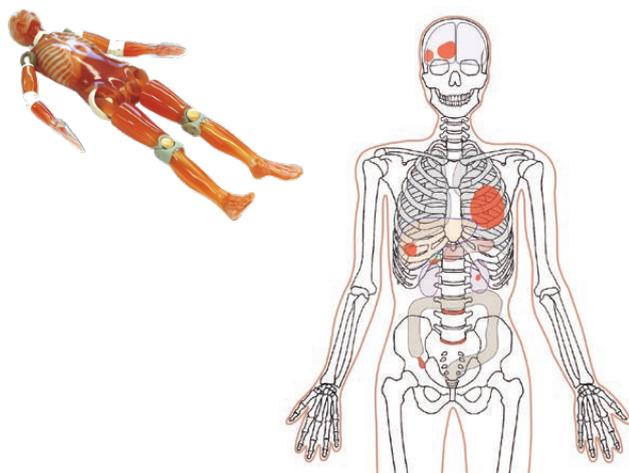
Packing size
W92×D57×H38 cm / W36×D22×H15 in
W90×D63×H22 cm / W35×D25×H8.7 in
W89×D57×H16 cm / W35×D22×H6.3 in

Product Code

Pediatric Whole Body Phantom KK1-PH-2B-41350-200

CT Whole Body Phantom with Pathologies

Implement theory with practice with pathological findings in this hands-on training phantom



Features

- Pathological findings added to detailed anatomy of PBU-60
- Radiology absorption and HU number approximate to human body
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

Anatomy

Cases	HU number at 80KeV	Cases	HU number at 80KeV	Cases	HU number at 80KeV
Brain tumor	130	Hepatic tumor	10	Kidney stone	170
Subarachnoid hemorrhage	90	Pancreatitis	30	Appendicitis	inside: 30 / outside: 40
Pulmonary tumor	inside: 30 / outside: 130	Gall stone	170	Spondylolisthesis	-

Full internal organs	Internal organs	HU number at 80KeV	Internal organs	HU number at 80KeV
	Bony Structure	Brain		Portal and hepatic veins
Synthetic skull	Cerebrum	40	Pancreas	30
Cervical vertebrae	Mesencephalon	40	Kidneys	30
Vertebrae	Cerebellum	40	Gallbladder	20
Clavicles	Cerebral ventricles	10	Spleen	50
Ribs	Eye balls	20	Seminal vesicle	25
Sternum	Arteries with contrast medium (left half only)	250	Aorta	40
Scapula	Lungs	-1000	Cava	70
Coxal bones	Pulmonary vessels	8	Ureter	ureteral wall: 30 / inside: 10
Femurs	Trachea	trachea wall: 8 / inside: -1000	Urinary bladder	10
	Heart	PBU-50: 8 / PBU-60: 40	Prostate	50
	Liver	70	Rectum	rectum wall: 70 / inside: -800
			Sigmoid Colon	colon wall: 70 / inside: -800

Set Includes

- | | |
|-------------------------|----------------------------------|
| 1 whole body phantom | 1 hand-fixture belt |
| 1 head supporter | 1 set of sample X-ray data (DVD) |
| 1 flat head screwdriver | 1 manual |

Dimensions

Phantom height
165 cm / 65 in

Phantom weight
50 kg / 110 lb

Packing weight
80 kg / 176 lb

Materials

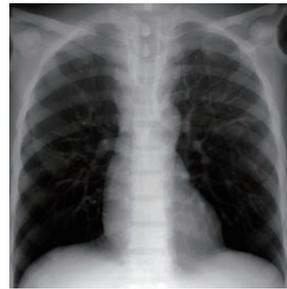
- Soft tissue:** urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)
Skull: epoxy resin (density: 1.11)
 *Phantom has no metal parts or liquid structure

Packing size
 W92×D57×H38 cm / W36×D22×H15 in
 W90×D63×H22 cm / W35×D25×H8.7 in
 W89×D57×H16 cm / W35×D22×H6.3 in

Pediatric Whole Body Phantom KK1-PH-2E-41350-700

Whole Body Phantom “PBU-50”

An essential asset for every radiography program



Features

- Radiology absorption and HU number approx. to human body.
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

skull / spine / clavicles / scapulae / ribs / sternum / coxal bones / lungs with pulmonary vessels / trachea (up to primary bronchi) / heart / liver with portal and hepatic veins / kidneys / humerus / antibrachial bone / bones of hand / femur / patella / lower leg bone / bones of foot

Position of Hands and feet

- left foot : plantar flexion
- right foot : dorsiflexion
- left hand : aligned fingers
- right hand : spread fingers

Set Includes

1 whole body phantom	1 hand-fixtured belt
1 head supporter	1 set of sample X-ray data (DVD)
1 flat head screwdriver	1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)
Skull: epoxy resin (density: 1.11)
 *Phantom has no metal parts or liquid structure

Dimensions

Phantom height
 165 cm / 65 in

Phantom weight
 50 kg / 110 lb

Packing weight
 80 kg / 176 lb

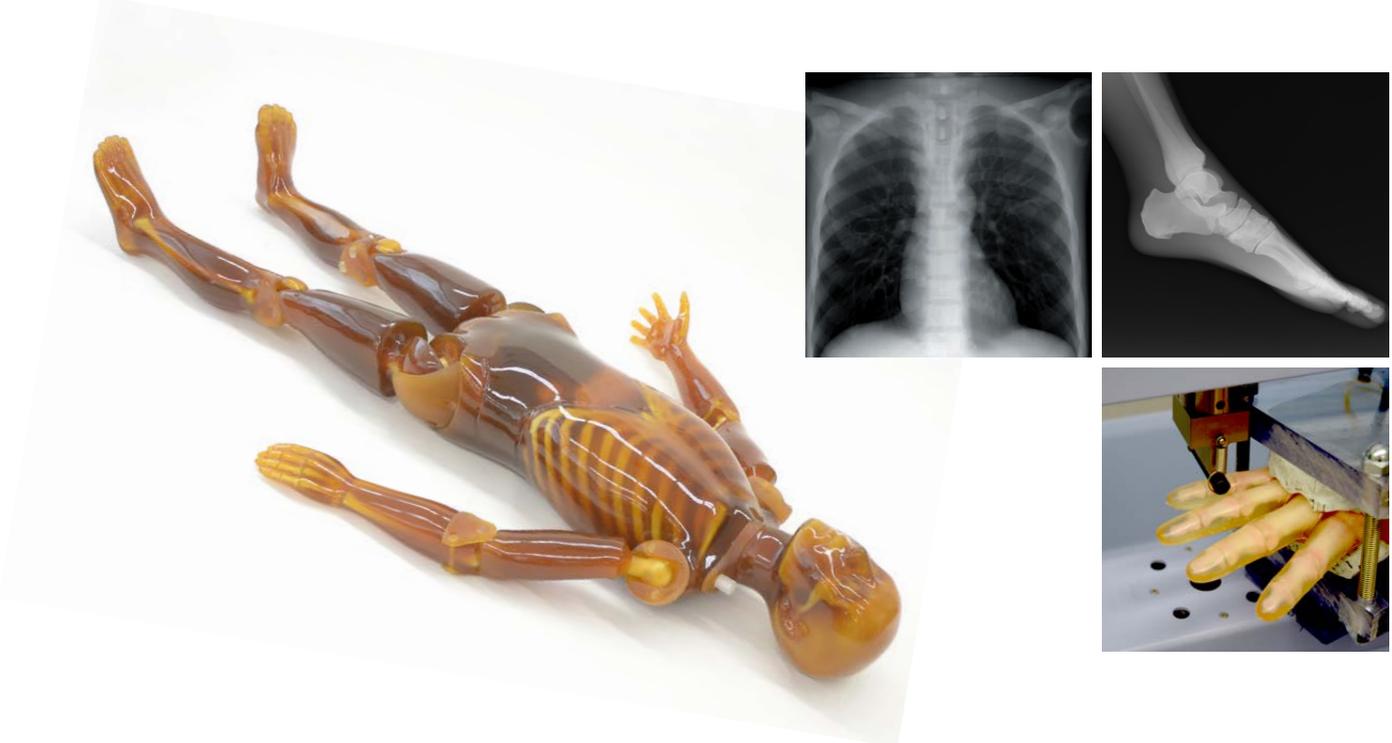
Packing size
 W92×D57×H38 cm / W36×D22×H15 in
 W90×D63×H22 cm / W35×D25×H8.7 in
 W89×D57×H16 cm / W35×D22×H6.3 in

Product Code

Pediatric Whole Body Phantom KK1-PH-2-41350-000

Tough Whole Body Phantom “PBU-90 RUGGED”

Designed for rough handling, improved durability and less maintenance



Features

- Radiology absorption and HU number approx. to human body.
- Main joints have close-to-human articulation
- Phantom can be disassembled into 10 individual parts

Applications

- Plain X-ray
- CT
- Basic patient positioning

skull / spine / clavicles / scapulae / ribs / sternum / coxal bones / lungs with pulmonary vessels / trachea (up to primary bronchi) / heart / liver with portal and hepatic veins / kidneys / humerus / antebrachial bone / bones of hand / femur / patella / lower leg bone / bones of foot

Position of Hands and feet

left foot : plantar flexion
 right foot : dorsiflexion
 left hand : aligned fingers
 right hand : spread fingers

Set Includes

1 whole body phantom	1 hand-fixture belt
1 head supporter	1 set of sample X-ray data (DVD)
1 flat head screwdriver	1 manual

Materials

Soft tissue: urethane based resin (density: 1.12)
 *Phantom has no metal parts or liquid structure

Dimensions

Phantom height
 165 cm / 65 in

Phantom weight
 50 kg / 110 lb

Packing weight
 80 kg / 176 lb

Packing size
 W92×D57×H38 cm / W36×D22×H15 in
 W90×D63×H22 cm / W35×D25×H8.7 in
 W89×D57×H16 cm / W35×D22×H6.3 in

Product Code

Pediatric Whole Body Phantom KK1-PH-60-41925-000

Body plates

Body plates to simulate a patient of BMI 32 / BMI 40



Features

For studying the effect of patient size on radiation dose and image quality.

Product Code

Body Plate BMI 32	KK1-41350-200-16
Body Plate BMI 40	KK1-41350-200-17

Set Includes

- 1 body plate (front)
- 1 body plate (back)
- 1 belts

Phantom size with plates

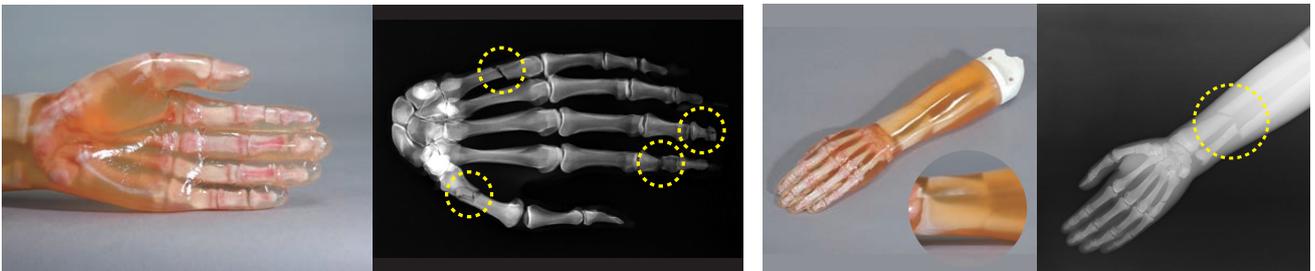
Circumference	Thickness
Chest : 100cm (BMI 32) , 117cm (BMI 40) / 25.5cm (BMI 32) , 35.5cm (BMI 40)	
Waist : 99cm (BMI 32) , 118cm (BMI 40) / 31.5cm (BMI 32) , 36 cm (BMI 40)	
Abdomen : 105cm (BMI 32) , 120cm (BMI 40) / 34.5cm (BMI 32) , 39.5cm (BMI 40)	

Dimensions

Phantom size		Packing size	Packing size
front : W67×D37×H26cm(BMI32) W67×D43×H27cm(BMI40)	back : W66×D36×H12cm(BMI32) W67×D36×H11cm(BMI40)	W77×D48×H40 cm × 2 boxes W30.3×D18.9×H15.7 in × 2 boxes	41350-200-16(BMI 32): 21 kg / 46.3 lb 41350-200-17(BMI 40): 34.5 kg / 76 lb

Fractured Hand/Forearm Phantom PH-2/2B

X-ray phantom for trauma evaluation



Bone Fractures

ulna, radius, first metacarpal, middle phalanx of the index finger, distal phalanx of the first finger (compressed fracture), fifth metacarpal.

Set Includes

- 1 fractured hand / forearm phantom

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)
 *Phantom has no metal parts or liquid structure

Product Code

Fractured Hand/Forearm Phantom	KK1-41350-000-11
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X-Ray Training Phantom PBU-POSE

For patient-friendly and accurate positioning learning
Supports scenario based trainings including communication skills



Features

- Light weight and close-to-human articulation as well as anatomical landmarks for positioning and patient handling.
- Soft touch of phantom's skin facilitates realistic simulation training scenario including communication skills.
- Radiography with a lower irradiation reducing risk for trainees and stress on the device.
- Enables training free from privacy concerns and inconveniences associated with use of standardized patients.

Applications

- Patient positioning
- Patient transportation
- Plain radiography



Anatomy

Skeletal system

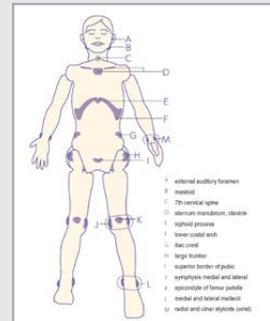
skull, cervical spine, vertebrae, clavicles, scapulae, sternum, pelvis, lungs (no vessels), heart, kidneys, upper and lower arm bones, carpal, metacarpal, femur, kneecaps, lower leg bones, tarsi, metatarsals, phalanges

Internal organs

trachea (up to 1st bifurcation), lungs (diaphragm only), heart, kidneys

Landmarks

external acoustic foramen, mastoid, seventh cervical vertebra, manubrium, xiphisternum, styloid process of radius, superior margin of the symphysis pubis, medial epicondyle of femur/epicondylus lateralis, patella, malleolus (internal condyle /external condyle), subcostal area, landmark on the body surface, trochanter, processus styloideus, ulnae



Set Includes

1 whole body phantom	1 set of assembly tools
1 head supporter	1 set of sample X-ray data (DVD)
1 pajamas	1 manual

Materials

Soft tissue: polyurethane foam (density 0.2)

Skeleton: epoxy resin (density 1.31)

Skull: urethane resin (density 1.12)

Dimensions

Height	Chest Girth	Thickness	Packing Size
165 cm / 64.9 in	85cm / 33.5in	20cm / 7.9in	W113×D59×H37 cm
Weight	Waist Girth	Thickness	W44.5×D23.2×H14.6 in
18 kg / 39.69 lb	75cm / 29.5in	19cm / 7.5in	

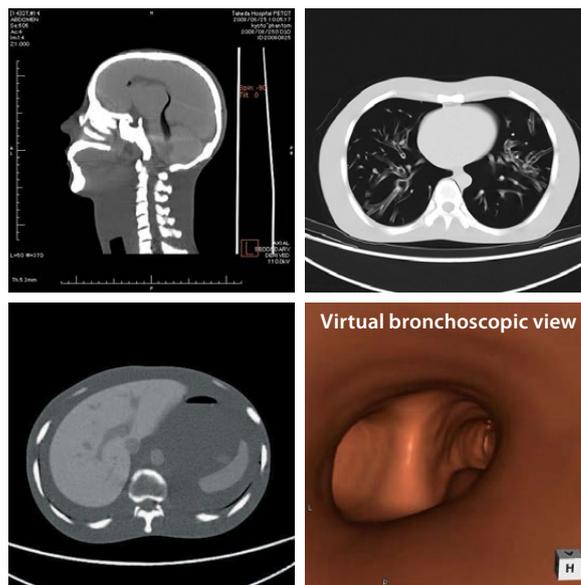
Product Code

X-Ray Training Phantom

KK1-PH-79

CT Torso Phantom CTU-41

A one-piece anthropomorphic torso phantom with anatomical structures
 Allows various CT approaches including helical scanning



Features

- One-piece structure of the phantom facilitate study in volume CT scan including helical scan.
- The phantom can be used for alignment in Image Guided Radiation Therapy (IGRT)

Applications

- CT

Anatomy

Synthetic bones with cartilage -artificial skull, vertebrae, clavicles, ribs, sternum, scapula, coxal bones, femurs

Internal organs		Hounsfield Number	Internal organs		Hounsfield Number
Soft tissue around each organ		8	Liver		70
Brain	Brain	40	Vein		40
	Ventricles	10	Gallbladder		20
Eye balls		20	Pancreas		30
Aorta		40	Spleen		50
Vena Cava		40	Kidney	Whole	30
Trachea	Up to the first branch	-800		Vein	40
	The second the third branch	8		Urethra	10
Heart		40	Urethra		10
Pulmonary Blood Vassal		8	Urinary Bladder		10
Cartilage in Costae		90			

Set Includes

- 1 CT torso phantom
- 1 storage case
- 1 set of sample X-ray data (DVD)
- 1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)

Dimensions

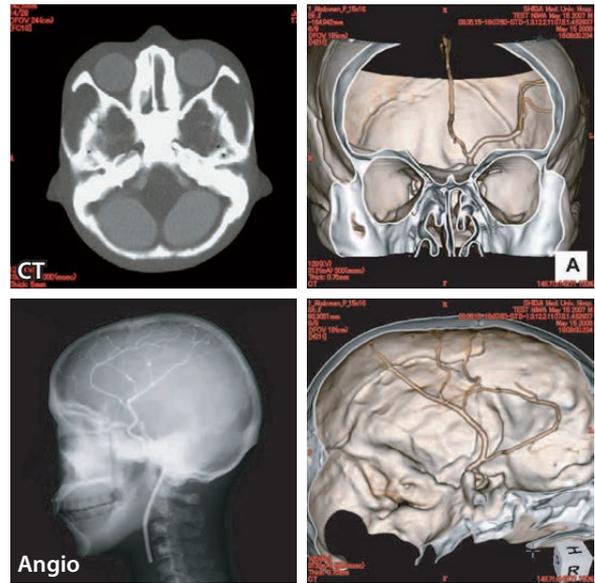
Height	Weight	Packing Size	Packing weight
100 cm / 39.4 in	45kg / 99lb	W119×D53×H48 cm W46.9×D20.9×H18.9 in	59 kg / 130lb

Product Code

CT Torso Phantom KK1-PH-4-41324-040

Angiographic CT Head Phantom ACS

With new variation: Head Phantom for MECT, which contains arteries of innovative water equivalent material.



Features

- Three variations of head phantoms with different features for arteries to meet your requirements:
- CT / Angiography / Multi Energy CT
- Contrast-enhanced left cerebral arteries are three-dimensionally embedded in the brain
- Vessels with 13mg/ml iodine (MECT type)

Applications

- CT (41309-100)
- Angiography (41309-200)
- Multi-energy CT (41309-300)

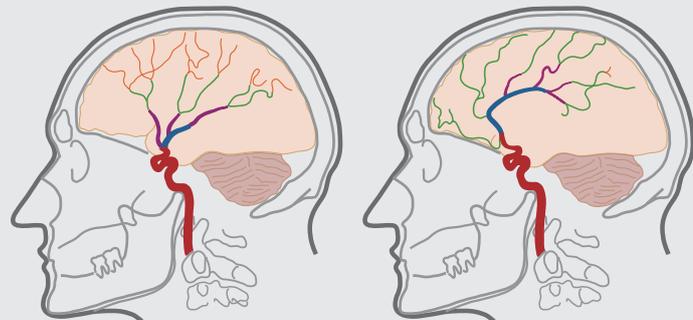
Anatomy

- A synthetic skull
- Soft tissue
- Simulated arteries with contrast medium
 - Left anterior cerebral arteries
 - Left middle cerebral arteries
 - Internal carotid artery
 - Diameters of simulated 0.5-4.0 mm
- *Arrangement of arteries are the same for all three types.

HU

Soft tissue	0	Cerebellum	40
Cerebrum	40	Cerebral ventricles	10
Mesencephalon	40	Eye balls	20

**calculated value at 80 keV



Middle cerebral artery

Anterior cerebral artery

Set Includes

- | | |
|----------------------------------|----------------|
| 1 head phantom | 1 storage case |
| 1 set of sample X-ray data (DVD) | 1 manual |

Materials

Soft tissue: urethane based resin
Cervical vertebrae (C1-C7): epoxy resin

Dimensions

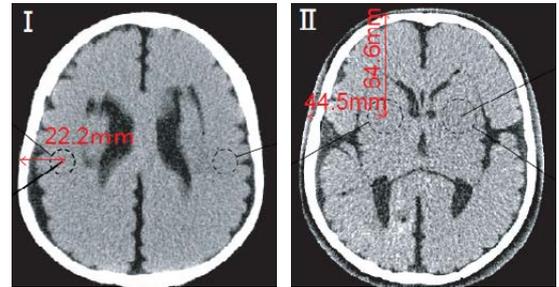
Height	Weight	Packing Size	Packing weight
33 cm / 13 in	5.25kg / 11.57lb	W46×D31×H32 cm W18.1×D12.2×H12.6 in	8 kg / 17.6 lb

Product Code

Angiographic CT Head	KK1-PH-3-41309-100
Angiographic Angio	KK1-PH-3-41309-200
Angiographic MECT	KK1-PH-3-41309-300

CT Stroke Head

Study and training for early detection of acute cerebral stroke



Features

- Sphere shaped simulated lesions (acute stroke) are embedded in the brain.
- This phantom support study and training in visualizing low-contrast lesions in low energy range

Applications

- CT

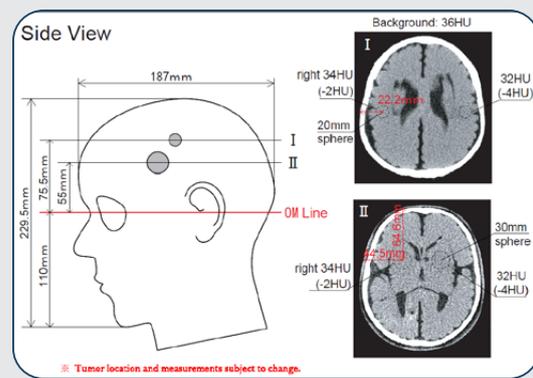
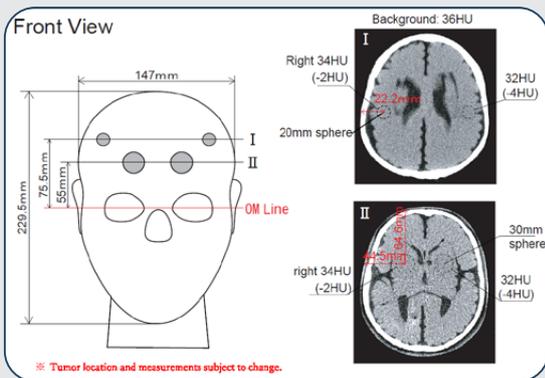
Anatomy and Pathology

- Anatomy
- A synthetic skull
- Soft tissue
- Brain
- Pathology
- Acute stroke (20mm dia. x2, 30mm dia. x 2)

HU (at 60keV)

Soft tissue	0
Cerebrum	40
Mesencephalon	40
simulated lesions	32
(acute stroke)	34

Cerebellum	40
Cerebral ventricles	10
Eye balls	20



Set Includes

- | | |
|----------------------------------|----------------|
| 1 head phantom | 1 storage case |
| 1 set of sample X-ray data (DVD) | 1 manual |

Materials

Soft tissue: urethane based resin (density 1.06)
Skull: urethane based resin (density 1.11)
 Cervical vertebrae (C1-C7): epoxy resin (density 1.31)

Dimensions

Height	Weight	Packing Size	Packing weight
33 cm / 13 in	5.25kg / 11.57lb	W46×D31×H32 cm W18.1×D12.2×H12.6 in	8 kg / 17.6 lb

Product Code

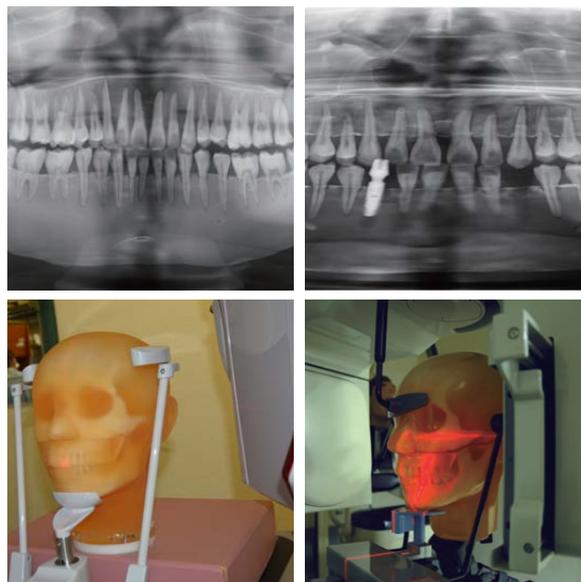
CT Stroke Head KK1-PH-77-41943-000

Dental Radiography Head Phantom

Open / closed mouth options and removable tongue allow a variety of application for training and research



Product supervision:
Akitoshi Katsumata, D.D.S., Ph.D. Professor
Asahi University, School of Dentistry



Features

- Each tooth is separately modeled and has a three-layer structure of enamel, dentin and pulp cavity
- Each hard tissue (enamel, dentin, cortical bone and cancellous bone) has a particular HU number and X-ray absorption rate
- Jaws and tongue are detachable to allow access to the oral cavity, pharyngeal cavity and maxillary sinus. Censors, simulated lesions, or residue can be set in these cavities
- Carotid arteries are prepared as lumens to accommodate simulated calcifications

Applications

- Dental radiography
panoramic (41301-500)
intra-oral (41301-400)

Anatomy and Pathology

- Synthetic skull with
 - » nasal cavity, maxillary sinus, mandible alveolar, maxillary alveolar, cervical vertebrae and hyoid bone, teeth with enamel, dentin and pulp cavity.
 - » Tongue, oral cavity, pharyngeal cavity and carotid arteries

Set Includes

1 main head unit	1 tripod
1 upper jaw (alveolar bone)	1 set of sample X-ray data (DVD)
1 lower jaw (alveolar bone)	1 storage case
1 tongue	1 manual
1 fixation base (including screws)	

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Dimensions

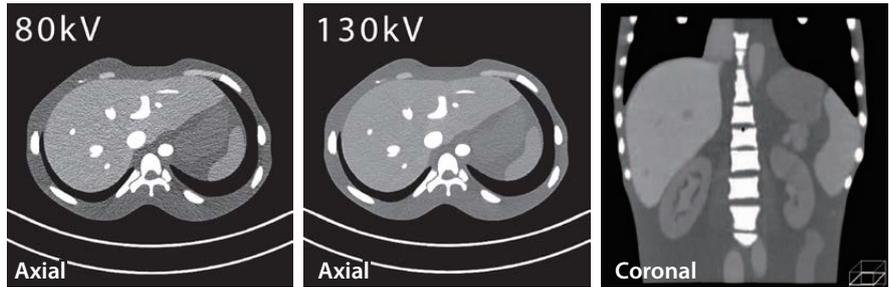
Phantom size	Packing size
W20×D21×H29 cm W7.8×D8.2×H11.4 in	W66×D54×H34 cm W44×D21×H13.3 in
Phantom weight	Packing weight
4.8 kg / 10.6 lb	12 kg / 26.4 lb

Product Code

Two-way set	KK1-PH-76-41301-300
Mouth closed	KK1-PH-76-41301-500
Open mouth	KK1-PH-76-41301-400

CT Abdomen Phantom

The phantom facilitates study of image fusion between CT and ultrasound in combination with US-1 Echozy*. New variation for MECT has been added



Features

- Two variation to meet your requirements:
- CT type (no contrast enhancement),
- MECT type (vessels with 13mg/ml** iodine and the liver of multi-energy CT compatible material)

**Concentration of iodine can be custom-ordered.

Applications

- CT
- Multi energy CT

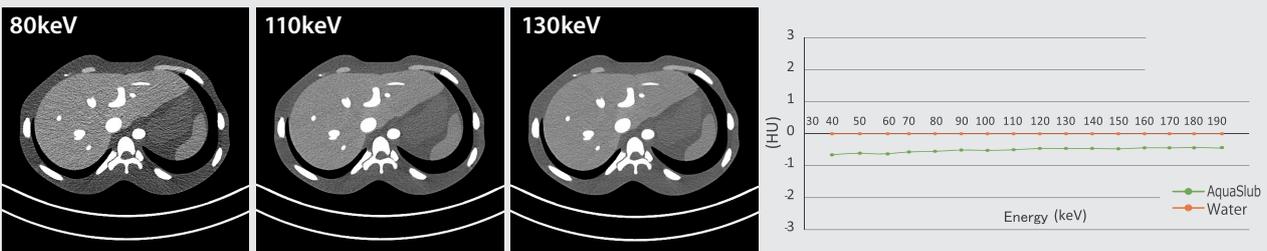
Anatomy

- lungs (no internal structure)
- heart (no internal structure)
- liver
- portal vein
- gallbladder
- hepatic vein
- hepatic artery
- kidneys
- pancreas
- spleen
- aorta
- IVC
- spinal column
- ribs

*Vessels and organs with a contrast agent can be included as a special order.

Images of Multi-Energy CT

Liver and contrast enhanced vessels are of multi-energy compatible AquaSlab. The below right graph shows WEM's high water-equivalency through wide energy range.



Set Includes

- 1 abdomen phantom
- 1 set of sample X-ray data (DVD)
- 1 storage case
- 1 manual

Materials

Soft tissue: urethane based resin (density: 1.06)
Synthetic bone: epoxy resin (density: 1.31)

Dimensions

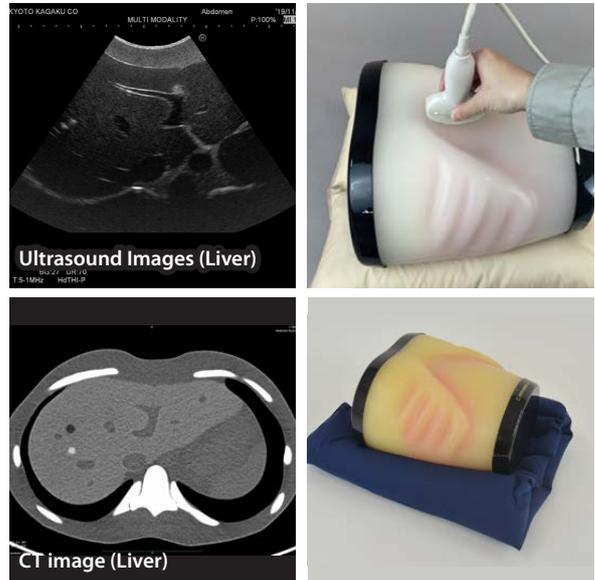
Phantom Size	Weight	Packing Size	Packing weight
W27×D16×H30 cm W10.6×D16×H11.8 in	12kg / 26.4lb	W46×D31×H32 cm W18.1×D12.2×H12.6 in	19 kg / 42 lb

Product Code

CT	KK1-PH-5-41360-000
MECT	KK1-PH-5-41360-100

Dual Modality Human Abdomen Phantom (CT, Ultrasound)

This Dual-Modality Phantom is a suitable item to conduct studies and training of fusion imaging for a wide range of clinical applications

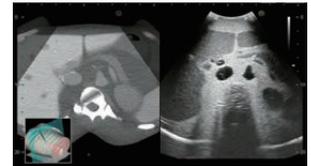


Features

- Fusion image generation training
- Mapping for biopsy (invasive procedures are not possible with this phantom)
- Surgical planning
- Radiation therapy planning
- Training for imaging skills in Ultrasound and CT

Applications

- CT
- Ultrasound



Anatomy

Liver

- (segmental anatomy, portal and hepatic venous systems, ligament, teres and ligamentum venosum)

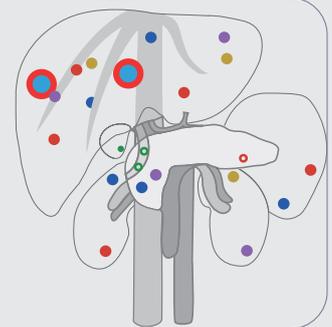
Biliary tract

- (gallbladder, cystic duct, intrahepatic and extrahepatic bile ducts)
- Spleen / kidneys

Detailed vascular structures

- (aorta, vena cava, celiac artery and its branches, portal vein and its branches, superior mesenteric vessels, renal vessels, and more)

	Liver	Gall bladder	Pancreas	Spleen	Kidney (r)	Kidney (l)
anechoic	3 HU50	HU20	HU30	1 HU10	1 HU10	1 HU30
hypoechoic	2 HU50					1 HU10
isoechoic	2 HU90		1 HU10			1 HU10
hyperechoic	2 HU90		1 HU10		1 HU10	
double edge	2 HU90					
stone		1 HU170	2 HU170			



Set Includes

- | | |
|----------------------|----------------|
| 1 abdomen phantom | 1 storage case |
| 1 positioning pillow | 1 manual |
| 1 talcum powder | |

Materials

polyurethane

Dimensions

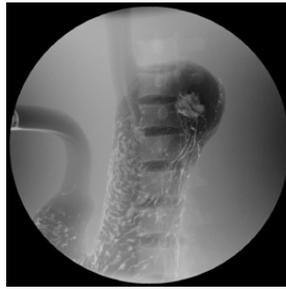
Phantom Size	Weight
W29×D19×H31 cm W11.4×7.5×12.2 inch	12 kg / 26.5 lbs

Product Code

CT KK1-PH-5-41360-000

Stomach Phantom BMU-1

Stomach phantom for double contrast gastrography



Features

- Life-size distended stomach with lesions modeled from real specimens
- Barium can be poured in the stomach for imaging
- Pathologies include early cancer and gastric ulcer

Set Includes

- 1 stomach phantom
- 1 storage case

Dimensions

Phantom Size	Weight	Packing Size	Packing weight
W30×D20×H33 cm W11.8×D7.9×H13 in	16 kg / 35.3 lb	W51×D39×H51 cm W20×D15.3×H20 in	20 kg / 44 lb

Applications

- Double contrast gastrography

Materials

Soft tissue: urethane based resin (density: 1.31)

Product Code

Stomach Phantom KK1-PH-18-41311-000

Rotation Stomach Phantom TMP-R

Rotatable phantom to simulate double contrast gastrography



Features

- Rotation system to simulate the movement of patient
- Life-size distended stomach with lesions modeled from real specimens
- Barium can be poured in the stomach for imaging
- Pathologies include early cancer and gastric ulcer

Set Includes

- 1 stomach phantom
- 1 rotation unit
- 1 controller
- supporting pole
- phantom holder
- model of lesions
- storage case

Applications

- Double contrast gastrography

Dimensions

Phantom Size
W25×D18×H28 cm W9.8×D7.1×H11 in

Materials

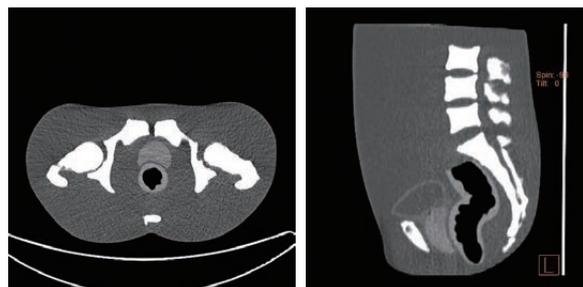
Urethane based resin / epoxy resin

Product Code

Rotation Stomach Phantom KK1-PH-19-41312-010

CT Prostate Phantom

Excellent phantom for therapy planning of prostate cancer



Features

- For alignment in Image Guided Radiation Therapy (IGRT)
- Organs with close-to-human HU facilitate training in CT scanning

Anatomy

- Prostate, urinary bladder with simulated internal fluid, seminal vesicles and rectum
- Bones: L3, L4 and L5, pelvis and femurs (partial)

Dimensions

Packing Size	Phantom Height	Packing weight
W44×D39×H42 cm W17.3×D15.3×H16.5 in	35 cm / 13.7 in	27 kg / 59.5 lb

Applications

- CT and Cone beam CT

Organs	HU at 80KeV	Organs	HU at 80KeV
Prostate	50	Bladder inside	10
Seminal vesicles	25	Rectal surface	70
Bladder surface	30	Rectal inner cavity	-800

Materials

Soft tissue: urethane based resin (density: 1.31)

Set Includes

- 1 stomach phantom
- 1 storage case

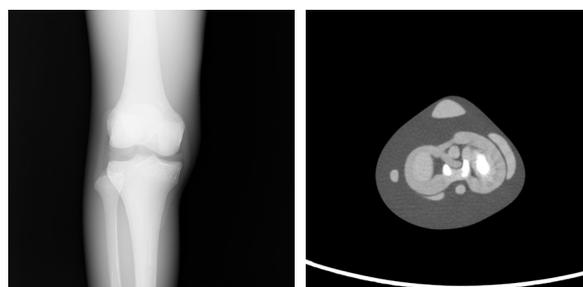
Product Code

CT Prostate Phantom

KK1-PH-46-41362-000

Knee Ligament Phantom

Detailed knee anatomy with HU of each bone, cartilage including meniscus and ligament



Features

- Anthropomorphic knee phantom that allows visualization of ligaments and cartilage
- Close-to-human radiation absorption and HU for each respective anatomical structure as well as realistic artifacts

Anatomy

femur / tibia / fibula / patella / articular cartilage of patella / meniscus / cruciate ligament / medial collateral ligament / fibular collateral ligament / articular cartilage

Dimensions

Packing Size	Phantom Weight
14 dia. × 45(H) cm 5.5 dia. × 17.7(H) in	4.5 kg / 10 lb

Applications

- Plain X-ray
- CT

Set Includes

- 1 knee phantom
- 1 storage case
- 1 manual

Materials

Soft tissue: urethane based resin (density: 1.31)

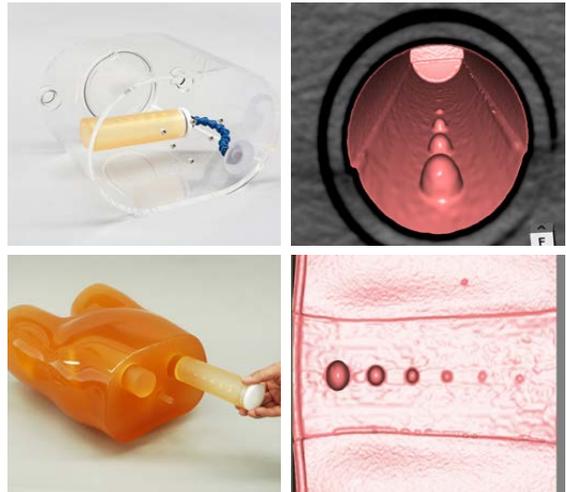
Product Code

Knee Ligament Phantom

KK1-PH-71-41935-000

CT Colonography Phantom NCCS

Innovative study tool for safe and effective CT Colon screening



Features

- Cylindrical colon units with targets that represent polyps can be set at the position of ascending colon, descending colon and rectum in the life-size lower torso phantom
- Four types of colon units are included for evaluation. Each unit has six targets lining in sequence on the inner wall of the unit
- Contrast agent can be poured into the colon units for tagging
- Pencil shaped ion chambers can be inserted in the center of the phantom for CTDI measurement

Applications

- Virtual colonography
- Visualization and detection of targets
- Study on optimal dose for low dose CT colonography
- Evaluation of accuracy of measurement (size, volume)
- Study on optimal density of contrast media

Variation of Simulated Tumors

Depressed type 2 variations	Virtual Endoscope View	Diagram (a: Outer diameter, b: Inner diameter, c: Height)	Depressed I: fixed diameter			Depressed II: fixed diameter		
			a: Outer diameter	b: Inner diameter	c: Height	a: Outer diameter	b: Inner diameter	c: Height
			0.7 cm/ 0.27 in	0.35 cm/ 0.13 in	0.2 cm/0.07 in	0.7 cm/ 0.27 in	0.35 cm/ 0.13 in	0.2 cm/0.07 in
					0.15 cm/0.06 in			0.15 cm/0.06 in
					0.1 cm/0.03 in			0.1 cm/0.03 in
					0.05 cm/0.02 in			0.05 cm/0.02 in
					0.025 cm/0.01 in			0.025 cm/0.01 in
					0.015 cm/0.005 in			0.015 cm/0.005 in
Projection type 2 variations	Virtual Endoscope View	Diagram (a: Diameter, b: Height)	Projection I: fixed diameter		Projection II: fixed ratio			
			a: Diameter	b: Height	a: Diameter	b: Height		
			1.0 cm/ 0.4 in	0.7 cm/0.27 in	1 cm/0.4 in	1.0 cm/0.39 in		
				0.5 cm/0.20 in	0.7 cm/0.27 in	0.7 cm/0.27 in		
				0.3 cm/0.11 in	0.5 cm/0.2 in	0.5 cm/0.20 in		
				0.2 cm/0.07 in	0.3 cm/0.11 in	0.3 cm/0.11 in		
0.1 cm/0.03 in	0.2 cm/0.07 in	0.2 cm/0.07 in						
0.05 cm/0.02 in	0.1 cm/0.03 in	0.1 cm/0.03 in						

Set Includes

- | | |
|------------------------------|-----------------------------|
| 1 lower torso phantom | 1 plug for ion chamber hole |
| 1 acrylic container | 1 holder for colon unit |
| 1 types of colon units | 1 base holder |
| 1 plugs for colon unit hole | 1 storage case |
| 1 plug with ion chamber hole | manual |

Product Code

CT Colonography Phantom KK1-PH-49-41910-000

Materials

Soft tissue: urethane based resin (density: 1.06)

Synthetic bone: epoxy resin (density: 1.31)

Dimensions

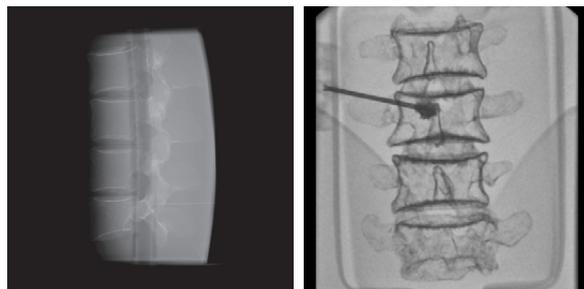
Packing size	Packing weight
---------------------	-----------------------

W63×D50×H29 cm	32 kg / 70.5 lb
W24.8×D19.6×H11.4 in	

Lumbar Spine Fluoroscopy Training Phantom

Ideal training tool for hands-on workshop of vertebroplasty

The phantom has two types of interchangeable and replaceable inserts with radio-opaque lumbar spine



"I have tested the final product with various different manufacturing kits and would have no hesitation in recommending these phantoms to clinicians who wish to teach any of the technical vertebroplasty procedures."

Dr David J Wilson MBBS BSc MFSEM FRCP FRCR
Consultant Musculoskeletal Interventional Radiologist

Features

- Two types of replaceable training block vertebroplasty block and anesthesia block
- Lumbar spine from L2-L5 can be visualized under X-ray.
- Realistic sensation when penetrating tissue and bones

Anatomy

- Lumbar spine (L2-L5)
- Spinal canal
- Epidural space (anesthesia block only)

Set Includes

1 lumbar torso	1 syringe
1 vertebroplasty block	1 irrigation bag
1 anesthesia block	1 storage case
1 skin cover	1 manual

Product Code

Lumbar Spine Fluoroscopy

KK1-PH-51-41913-000

Training Skills

- Recognition of fluoroscopic anatomy and landmarks
- Vertebroplasty
- Fluoroscopy guided epidural anesthesia:
needle placement in facet joint injection, root block and discogram.

Materials

Soft tissue: urethane based resin (vertebroplasty block) silicone (anesthesia block)

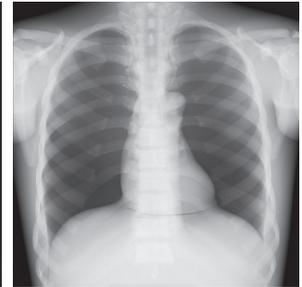
Synthetic bone: epoxy resin

Dimensions

Phantom size	Packing size
W33×D21×H30 cm	W52×D44×H30 cm
W13×D8.2×H11.8 in	W20.4×D17.3×H11.8 in

Sectional Phantom Series

Sectional phantoms allow for imaging of individual anatomy as needed



Features

- Opaque and transparent types for a diverse training possibility
 - » Opaque: advanced version with close-to-reality challenges in imaging
 - » Transparent: visible bones facilitate understanding in keys for positioning
- Movable joints of the knee and the elbow for realistic positioning

Applications

- Plain X-ray

Items

Region	Code	Product Name	Note
	41926-000	Head (Opaque)	Stand-alone design can be used with the adjustable head positioning stand to demonstrate accurate skull positioning
	41926-010	Head (Transparent)	
	41926-060	Thorax (Opaque)	Includes thoracic skeletal system with embedded mediastinal space and bronchus to provide realistic imaging. The scapulae are rotated outside of the lung fields for PA chest imaging. *Capillaries are not included
	41926-070	Thorax (Transparent)	
	41926-080	Pelvic (Opaque)	
	41926-140	Right Elbow (Opaque)	Natural flexion range allows for AP/lateral and partial flexion views with one phantom
	41926-150	Right Elbow (Transparent)	
	41926-020	Right Hand (Opaque)	Spread finders for PA projection
	41926-030	Right Hand (Transparent)	
	41926-040	Left Hand (Opaque)	
	41926-050	Left Hand (Transparent)	
	41926-180	Right Knee (Opaque)	Movable patella and joint with flexion allow for realistic positioning of the knee for AP, lateral, oblique, sunrise and tunnel views
	41926-190	Right Knee (Transparent)	
	41926-100	Right Foot (Opaque)	Dorsiflexion
	41926-110	Right Foot (Transparent)	
	41926-120	Left Foot (Opaque)	Plantar flexion
	41926-130	Left Foot (Transparent)	

Set Includes

- 1 phantom
- 1 set of sample X-ray data (DVD)
- manual

*41926-000/010 comes with an adjustable head supporter

Materials

Soft tissue: urethane based resin

Synthetic bone: epoxy resin (density: 1.31)

Skull: epoxy resin (density: 1.2)

*Phantom has no metal parts or liquid structure

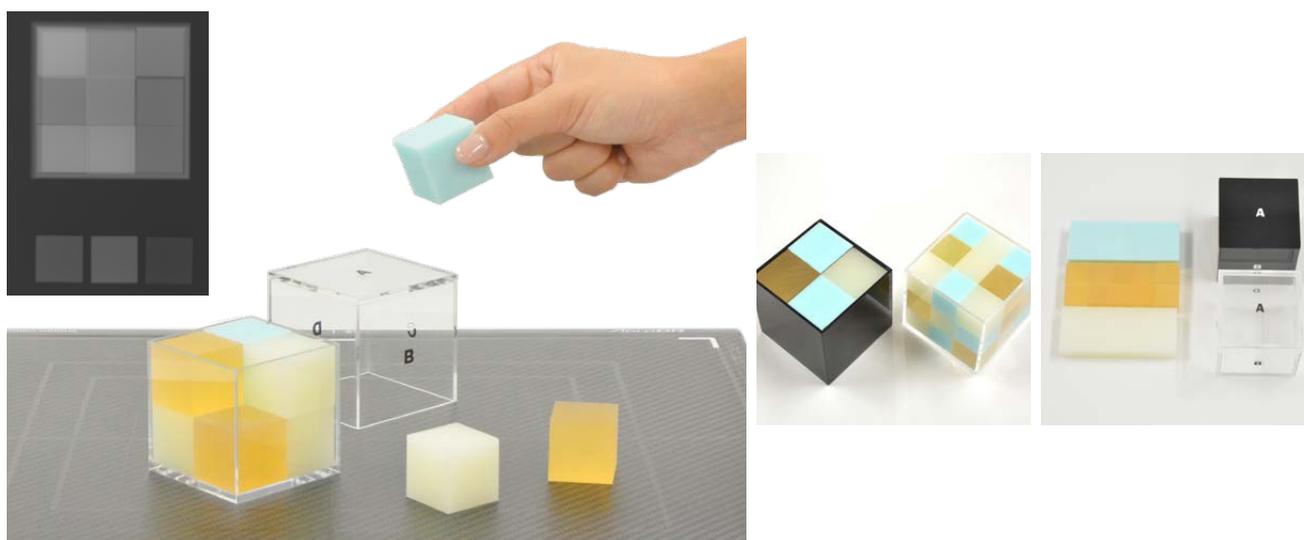
Product Code

CT Colonography Phantom

KK1-PH-61-41926-000

Radiology Cube Phantom XCUBEFAN

Designed for beginners to provide better understanding of the special characteristics seen in radiology imaging



Features

- Compact yet practical education tool on usage of x-ray equipment and the interpretation of diagnostic images
- Provides a large range of practice by stacking and repositioning different blocks with varied radiodensities
- Includes black and clear container boxes for practice and visual explanation

Applications

- Plain X-ray
- Interpretation

Anatomy

Active learning through FAN (fun) of competition and game



Photo by courtesy of Komozawa University, Japan

1. Arrange the cubes

Arrange cubes in the black case and hand it to the challengers.

2. Select parameters and acquire images

The challengers radiograph the black case.

3. Analyze the images

The challengers reason and infer to find out the three dimensional arrangement of cubes in the black case.

Three kinds of cubes with different HU

	HU	Density	Material
Orange	0	1.06	Polyurethane
Blue	500	1.4	Epoxy
Yellow	1000	1.21	Epoxy

Set Includes

- 1 XCUBEFAN case (clear)
- 1 XCUBEFAN case(black)
- 5 orange cube (30mm)
- 5 blue cube (30mm)
- 5 yellow cube (30mm)
- instruction manual

- 1 XCUBEFAN case (clear)
- 1 XCUBEFAN case(black)
- 10 orange cube (20mm)
- 10 blue cube (20mm)
- 10 yellow cube (20mm)
- instruction manual

Dimensions

Phantom size

30mm cube:
3×3×3 cm each
1.18×1.18×1.18 in each

20mm cube:
2×2×2 cm each
0.78×0.78×0.78 in each

Packing size

W36×D25×H19 cm
W14.2×D 9.8×H 7.5 in

Materials

Phantom cube: epoxy, polyurethane

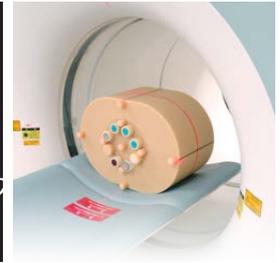
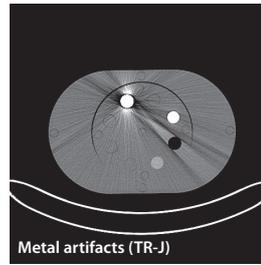
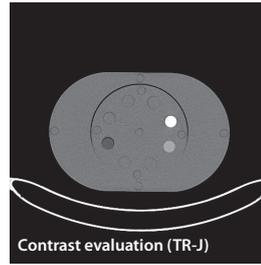
Case: acrylic

Product Code

Radiology Cube Phantom XCUBEFAN KK1-PH-78-41944-000

Multi Energy CT Quality Assurance Phantom

Water Equivalent Material "Aqua Slab", various inserts and empty bottles enable to verify the appropriate Multi-Energy CT settings



Features

- Phantom made of innovative water equivalent material "Aqua Slab"
- Empty bottles allow for the insertion of various research samples and observation under Multi-Energy CT
- Help to save time and costs of preparing custom-made phantoms
- Two different sizes of truck (body) phantom. (TR-I, TR-J)

Inserts

Color	Name	Size	Qty
Silver	Water Equivalent Material Inserts	dia.20mm	8
Red	Titanium Insert	dia.12mm	1
Blue	Soft tissue (equivalent to liver)	dia.20mm	1
Blue	Iodine concentration 4mgI/mL	dia.20mm	1
Blue	Iodine concentration 8mgI/mL	dia.20mm	1
Transparent	Iodine concentration 12mgI/mL	dia.20mm	1
	Water container	dia.20mm	1
	Empty bottle with spacer *for experiment		20

Applications

Study for:

- ME-CT image analysis protocol
- Metal artifact reduction
- Reduction of contrast media

Evaluation Parameters

- Uniformity
- Signal-to-noise ratio (SNR)
- Image contrast
- CT dose index (CTDI)

Set Includes

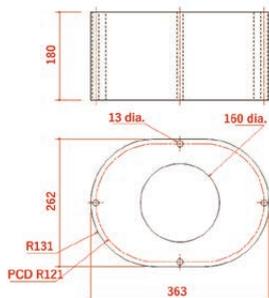
- | | |
|---------------------------------------|-----------------------------|
| 1 truck phantom | 1 soft tissue insert |
| 1 internal cylindrical phantom | 1 water container inserts |
| 9 filling inserts for dosimeter holes | 20 empty bottles |
| 8 "Aqua Slab" inserts | 8 spacers for empty bottles |
| 3 iodine inserts (4, 8, 12mgI/mL) | manual |
| 1 titanium insert | |

Product Code

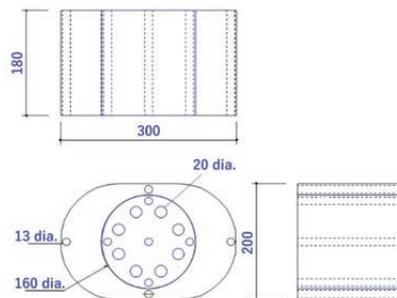
Multi Energy CT QA (TR-I)	KK1-PH-75B-41941-000
Multi Energy CT QA (TR-J)	KK1-PH-75A-41941-000

Dimensions

Phantom size (TR-I):



Phantom size (TR-J):



Multi Energy CT Quality Assurance Phantom-TR-A type

“Aqua Slab” CTQA phantom with equidistance placement of inserts, meeting international recommendation



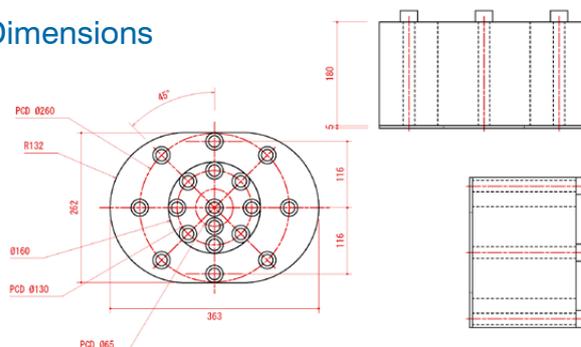
Features

- The sectional areas of the assembled phantom with the truck phantom and the independently used inner phantoms are equal to those of the CTDI body and the head phantom respectively
- The holes to accommodate sample inserts and dosimeters for evaluation are placed concentrically at equidistance from the isocenter, along with the one placed off the center, meeting international recommendation for CTQA

Applications

Study for ME-CT image analysis, artifact reduction, contrast media

Dimensions



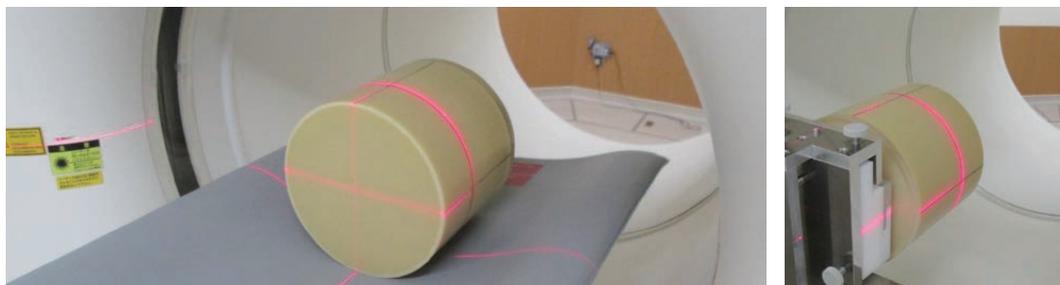
Product Code

Multi Energy CT QA (TR-A)

KK1-PH-75C

Daily QA Phantom WEM “Aqua Slab”

Water Equivalent Material “Aqua Slab” updates tasks of daily QA



Features

- Phantom made of water equivalent material “Aqua Slab”
- Help to save time and costs of preparing water phantoms for researchers

Dimensions

Dimensions [41948-000] 20×D20×H20 cm
 [41948-100] 20×D20×H21.5 cm
 Weight 41948-000 / 6.4Kg
 41948-100 / 6.5Kg

Applications

Daily QA of CT

Set Includes

1 aqua slab phantom

Materials

Polyurethane

Product Code

Daily QA Phantom WEM

KK1-PH-80

"Aqua Slab" Multi-Energy CT Compatible Material

For Quality Assurance and Research

Overview

Multi-Energy CT (MECT) or Dual Energy CT (DECT) represents a new frontier in rapidly advancing medical imaging and is now being integrated into clinical practices in hospitals.

This technology enables material differentiation, elemental decomposition, and material quantification.

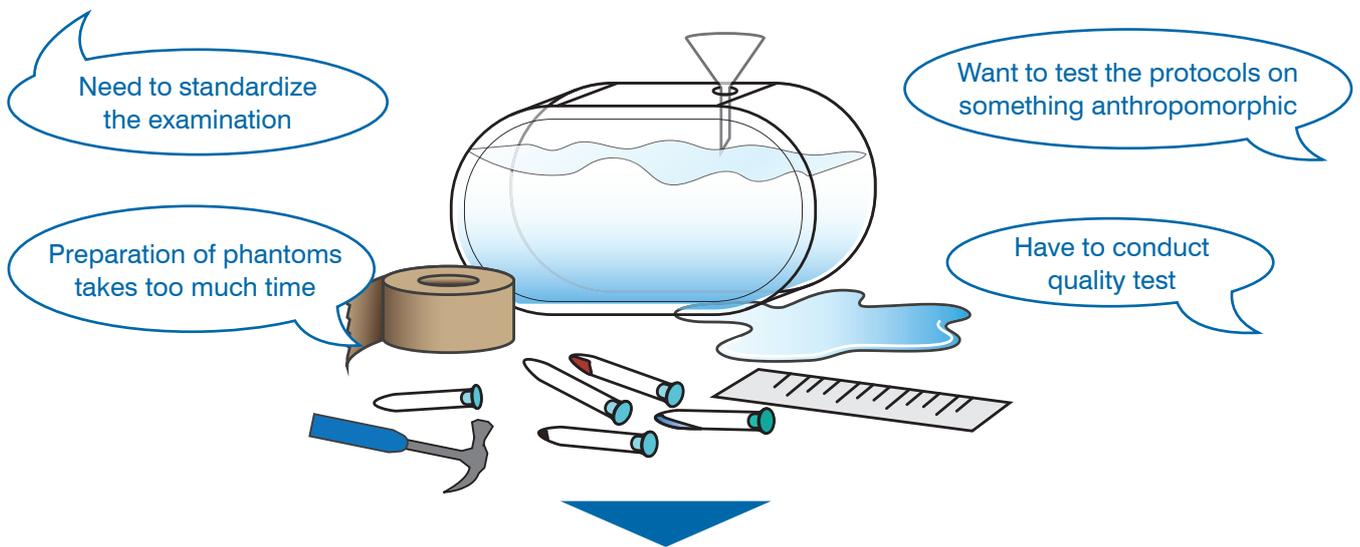
Such capabilities are expected to enhance diagnosis, improve image quality, reduce radiation exposure, minimize contrast agent volume, and pave the way for functional imaging. Nevertheless, further studies are needed across various fields, including CT equipment quality management, protocol verification, and expansion of clinical applications, to fully realize the benefits of this technology.

Kyoto Kagaku supports researchers and clinicians with state-of-the-art innovative phantoms.

Background

In numerous MECT/DECT studies, water phantoms have been utilized. However, employing real water can entail significant effort in preparation and handling. Meanwhile, the use of acrylic containers restricts the design of phantoms.

Kyoto Kagaku supports researchers and clinicians with state-of-the-art innovative phantoms.



Kyoto Kagaku Multi-Energy CT phantom series assists you promptly, saving your time and energy

Phantoms can be made in complex and detailed shapes including anatomical structures

Product Lineup

Iodine concentrations can be custom-ordered Contact us!



Angiographic CT Head Phantom ACS
Head with MECT compatible arteries



CT Abdomen Phantom
Abdomen with MECT compatible vessels and liver



Gout Foot Phantom
Reference product



Multi Energy CT Quality Assurance Phantom
Phantom for quality assurance. A variety of research samples can be inserted.

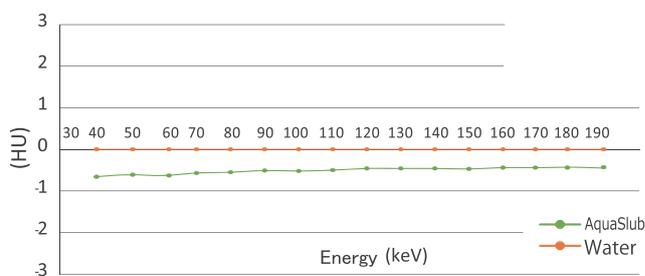
Daily QA Phantom WEM "Aqua Slab"

Significant Features of “Aqua Slab”

About “Aqua Slab” Water Equivalent Material

Aqua Slab has high equivalency to water in diagnostic energy ranges(40-190KeV)

Co-developed with; ICHIKAWA Katsuhiro, Ph.D., Professor, Faculty of Health Sciences, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University, Japan



Experiment

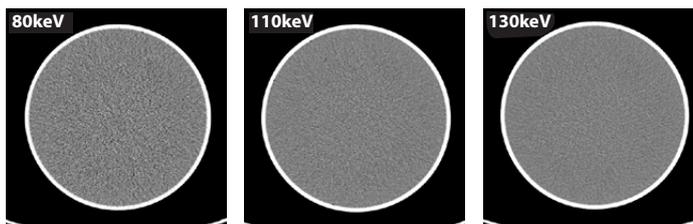
Scan different material inserts (rods) in a water tank

Rods are not shown in the CT images!!



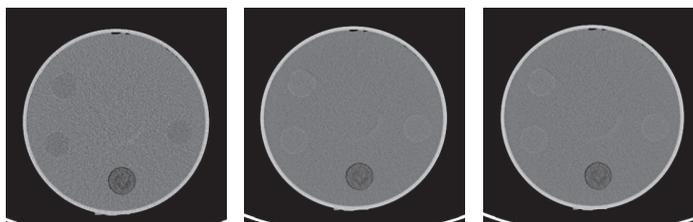
Aqua Slab

Nine rods of AquaSlab are “invisible” under CT



Materials

Two rods of Aqua Slab and four rods of conventional materials

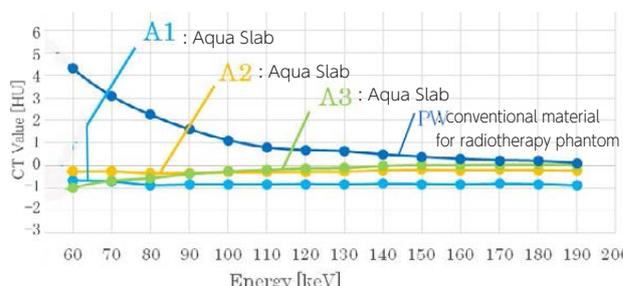


Supports iodine quantification and material-decomposition

Unlike conventional 'water substitute' materials, the Aqua Slab maintains water equivalency under low energy ranges. This feature supports studies that involve iodine quantification.

Saves time and effort for research and explore new possibilities.

Helps to save time, costs, and effort instead of designing and producing custom-made acrylic water phantoms. Unlike phantoms that use real water, solid material (Aqua Slab) phantoms eliminate the cumbersome process of changing water and internal rods.



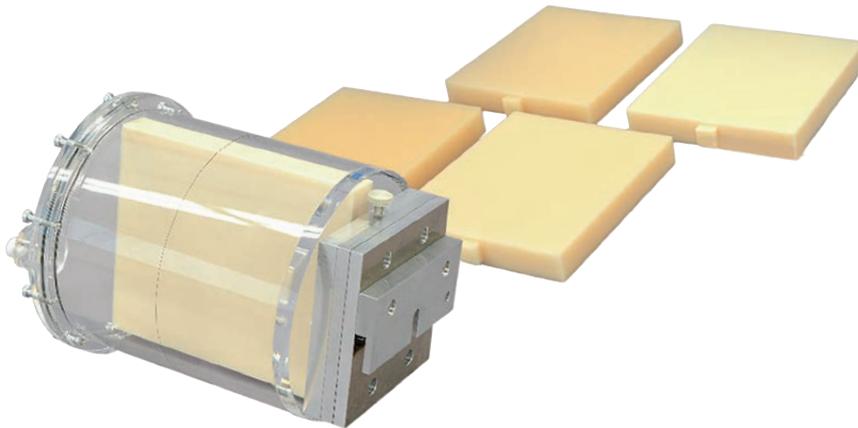
Ryota Matsui, Ishikawa Katsuhiro, Hiroki Kawashima, "Development of highly precise Water Equivalent phantom for CT machine" Ichikawa Lab, Kanazawa Univ. <http://ichiken.w3.kanazawa-u.ac.jp/img/file2.pdf> (cited 2019-05-20)

Conclusion

1. Kyoto Kagaku Multi-Energy CT phantoms can save time and costs rather than preparing custom-made phantoms for researchers.
2. The water equivalent material “Aqua Slab” allows for the creation of phantoms with innovative designs while ensuring the credibility of water phantoms.

CT ERF Phantom HIT

A phantom designed for physical evaluation of iteratively reconstructed images under low CNR

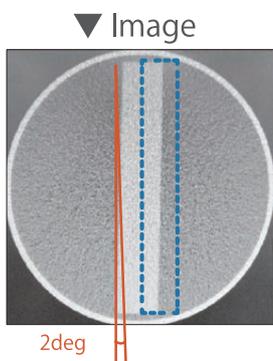


Features

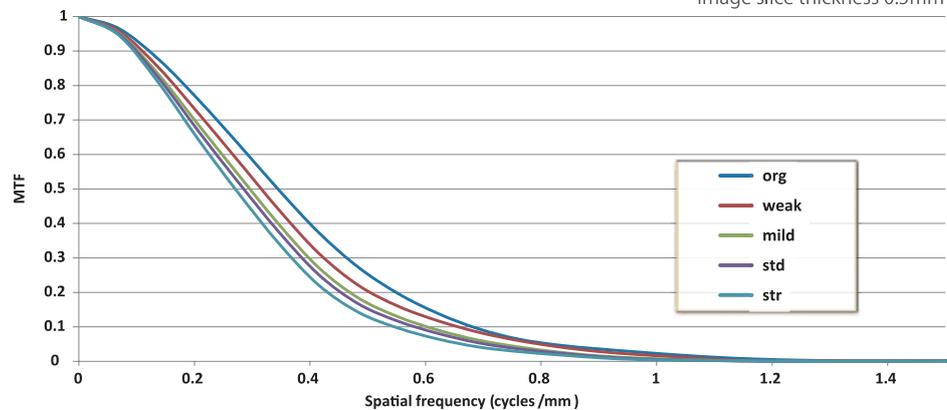
- This phantom designed to physically evaluate the performance of successive approximation reconstruction images under low CNR conditions when MTF evaluation by PSF is not very appropriate without deviating from clinical practice.
- This phantom is used to evaluate MTF from low-CNR images using the ESF method, which measures the blurring of block edges, so that performance characteristics in reconstructed images applying successive approximation under low-CNR conditions can be determined.

Applications

- CT



▼ Modulation Transfer Function
image slice thickness 0.5mm



Set Includes

- | | |
|---------------------------------------|---|
| 1 cylindrical container (200 mm dia.) | 1 fixture for the cylindrical container |
| 5 measurement plates | 1 philips screw driver |
| 1 rotation holder | extra screws |
| 1 petroleum jelly | 1 storage case |
| 1 angle adjustment holder | manual |

Dimensions

Phantom size:
20 dia. × 25 cm
7.8 dia. × 9.8 in
Phantom weight:
4.5 kg / 10 lb

Materials

Acrylic resin, polyurethane

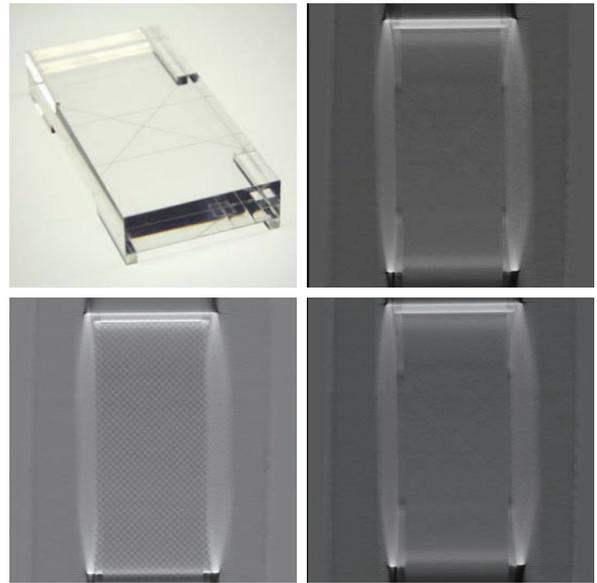
Product Code

CT ERF Phantom HIT

KK1-PH-55-41920-100

Tomosynthesis Phantom NS

Allowing evaluation of reconstruction slices and uniformity in the measurement of slice thickness through showing the images numerically and graphically



Applications

- Tomosynthesis

Evaluation Parameters

- Verification of reconstruction interval
- Slice thickness
- Uniformity

Reconstruction interval unit	Slice thickness unit	Uniformity unit	Height setting rack
<p>Upper side: three parallel lines Lower side: cross lines</p>			
<p>For verification of the spatial interval in reconstruction Stainless steel line: 0.1 mm/0.004 in dia.</p>	<p>For calculation of slice thickness using FWHM Hole: 1.0 mm/0.04 in dia. Aluminum plate: 0.5mm/0.02 in thick Acrylic plate 5mm/0.2 in thick. *the aluminum plate is sandwiched between layers of Acrylic 70×150 mm/2.8×5.9 in</p>	<p>For evaluation of uniformity and tilting of the examination table 70×150 mm/2.8×5.9 in</p>	<p>Test units can be set in the aluminum supporting box at 10, 15 or 20 mm (0.4,0.6 or 0.79 in) height</p>

Set Includes

- 1 reconstruction positioning unit
- 1 slice thickness unit
- 1 uniformity unit
- height setting rack
- manual

Materials

Acrylic resin, Bakelite, aluminum, copper, stainless

Dimensions

Phantom size: W7×D15×H25 cm / W2.7×D6×H9.8 in
Packing size: W46×D31×H17 cm / W18.1×D12.2×H6.7 in
Packing weight: 2 kg / 4.4 lb

Product Code

Ladder Phantom

KK1-PH-9-2-41334-130

CT-DI Phantom (Head and Body Phantom)

A set of phantoms for CTDI-100, conforming to requirements described in 21 CFR 1020.33, IEC 61223-3-5: 2004, and IEC 61223-2-6: 2006 as consistency test



A set with different type of tissue substitute can be custom-ordered

Features

- Represent adult head and body as well as pediatric body
- Can be used for initial and follow-up QA tests

Set Includes

- 1 head phantom
- 1 body phantom
- 1 filling rods manual

Materials

Acrylic resin

Evaluation Parameters

- Computed Tomography Dose Index (CTDI)
- Dose profile

Dimensions

Body phantom: 32 dia. x 15 cm / 12.6 dia. x 5.9 in

Head phantom: 16 dia. x 15 cm / 6.3 dia. x 5.9 in

Phantom weight: 15kg / 33lb, 4kg / 8.8lb

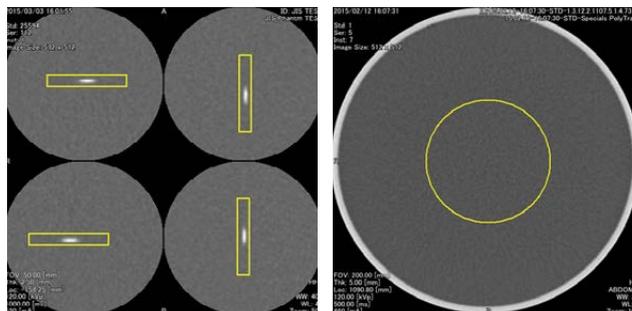
Product Code

Ladder Phantom

KK1-PH-59-41924-000

CT QA Phantom JCT II

CT QA phantom for acceptance test as well as daily QC



Features

- The phantom can be used for initial and follow-up QA tests listed below, described in JIS Z 4752-3-5: 2008 (IEC 61223-3-5: 2004) and Z 4752-2-6: 2012 (IEC 61223-2-6: 2006)
- Conforming to JIS Z 4923:2015

Set Includes

- | | |
|----------------------------------|---|
| 1 cylindrical container | 1 fixture for the slice thickness unit |
| 1 slice thickness unit (axial) | 1 fixture for the cylindrical container |
| 1 spatial resolution unit | 1 Vaseline |
| 1 repeated pattern unit | 1 set of screws (spare) |
| 1 low contrast resolution unit | 1 angle adjustment holder |
| 2 slice thickness unit (helical) | manual |

Materials

Acrylic resin, polyurethane, stainless

Evaluation Parameters

- Axial scan: Slice thickness / spatial resolution / low contrast resolution / noise / mean HU number / uniformity
- Helical scan: Slice thickness

Dimensions

Phantom size: 20 dia. x 20 cm / 7.9 dia. x 7.9 in

Phantom weight: 3 kg / 6.6 lb

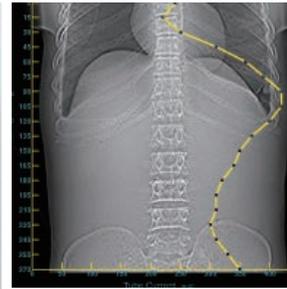
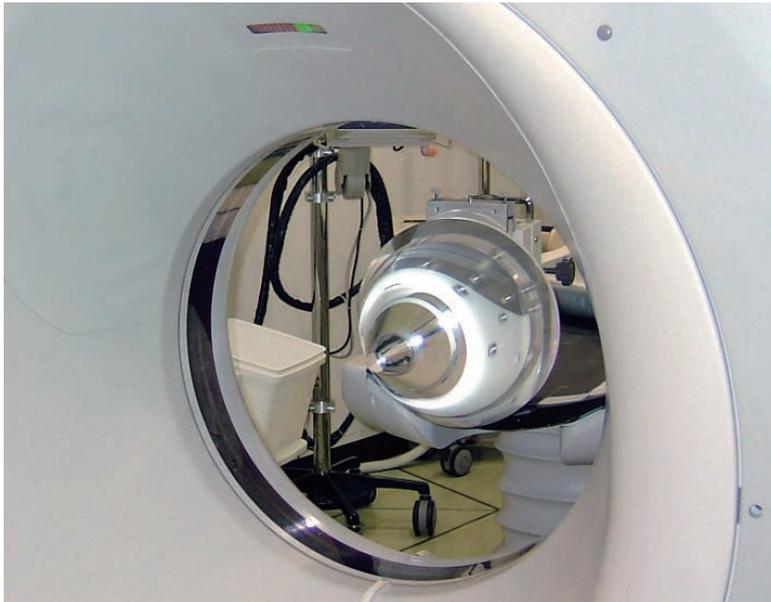
Product Code

CT QA Phantom JCT II

KK1-PH-54-41919-000

CT-AEC Phantoms

Four types of phantoms designed to evaluate CT-AEC performance



example of CT-AEC with an anthropomorphic phantom

Features

- Image quality can be evaluated by noise and S.D. on the phantom section images

Applications

- CT-AEC

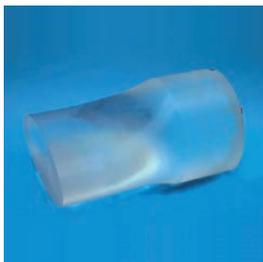
Variations



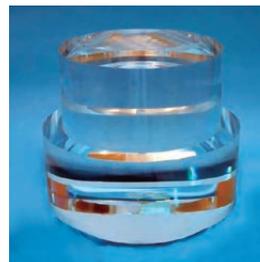
Cone Phantom:
evaluates performance of AEC for different patient sizes and gradual size changes in size along the axis



Elliptical Cone Phantom:
in combination with the Cone phantom facilitates evaluation of XY AEC



Variable-XY Phantom:
evaluates performance of XY AEC as cross section changes from circular to elliptical



Stepped Phantom:
evaluates the performance of the AEC to sudden changes in patient's cross section

Set Includes

- 1 phantom with an attachment bracket

Materials

Acrylic resin

Dimensions

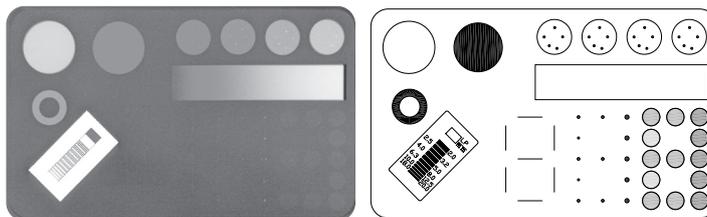
Phantom size: W7×D15×H25 cm / W2.7×D6×H9.8 in
Packing size: W46×D31×H17 cm / W18.1×D12.2×H6.7 in
Packing weight: 2 kg / 4.4 lb

Product Codes

Cone (Apollo Phantom)	KK1-PH-7-41339-010
Elliptical Cone Phantom	KK1-PH-7-41339-020
Stepped Cylinder Phantom	KK1-PH-7-41339-030
Variable XY Phantom	KK1-PH-7-41339-040

Digital Mammographic Phantom NCCE

An integrated QA phantom for digital mammography systems



Features

- Outer shape of the phantom simulates a compressed breast of D shape
- Targets includes simulated microcalcifications, nylon fibrils, acrylic disks, an aluminum ring, Teflon disks, a Teflon ruler (slope) and a resolution test chart

Set Includes

- 1 phantom
- 1 storage case

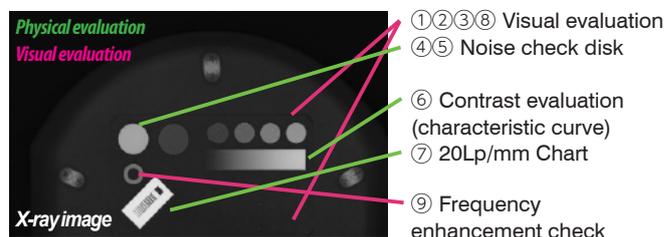
Product Code

Digital Mammographic Phantom NCCE KK1-PH-13-41329-010

Evaluation Parameters

- Contrast resolution
- Frequency enhancement
- Noise and contrast transfer function

Targets and Evaluation



- ①②③④ Visual evaluation
- ④⑤ Noise check disk
- ⑥ Contrast evaluation (characteristic curve)
- ⑦ 20Lp/mm Chart
- ⑨ Frequency enhancement check

BMD Chart Phantom UHA

Bone Mineral Density chart for microdensitometry (MD) method



Features

- 21 steps with different hydroxyapatite content
- Steps range from 0 to 400 mg/cm², with 20mg/cm² difference each

Set Includes

- 1 phantom
- 1 storage case

Applications

- microdensitometry

Product Code

BMD Chart Phantom UHA KK1-PH-10-41322-000

Water Body Phantom WAC

Chest and abdomen phantom to help measure surface dose



Features

- Water body phantom represents human chest and abdomen to serve as radiation absorber and scatterer.
- The phantom is a double walled cylindrical container with track shaped cross section.
- For chest, fill water between two walls.
- For abdomen, fill the both spaces.

Set Includes

- 1 phantom
- 1 storage case

Dimensions

Phantom Size:
W30×D20×H45 cm
W11.8×D7.9×H17.7 in

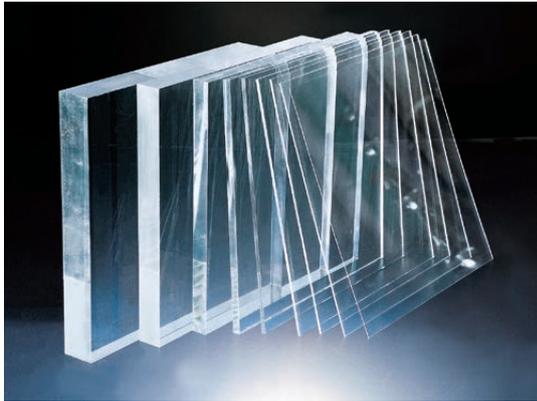
Product Code

Water Body Phantom WAC

KK1-PH-17-41317-000

Acrylic Phantom XAC

Slab phantoms for radiation absorption and scattering measurement

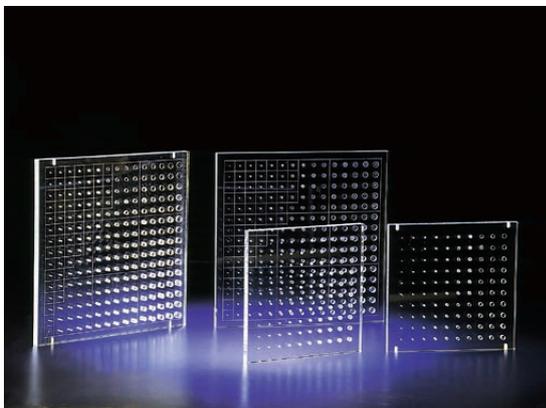


Variations

30 × 30 × 0.1 cm/11.8 × 11.8 × 0.04 in	XAC-01-41430-000
30 × 30 × 0.2 cm/11.8 × 11.8 × 0.08 in	XAC-02-41431-000
30 × 30 × 0.3 cm/11.8 × 11.8 × 0.12 in	XAC-03-41432-000
30 × 30 × 0.4 cm/11.8 × 11.8 × 0.16 in	XAC-04-41433-000
30 × 30 × 0.5 cm/11.8 × 11.8 × 0.2 in	XAC-05-41434-000
30 × 30 × 0.8 cm/11.8 × 11.8 × 0.3 in	XAC-08-41435-000
30 × 30 × 1 cm/11.8 × 11.8 × 0.4 in	XAC-1-41436-000
30 × 30 × 2 cm/11.8 × 11.8 × 0.8 in	XAC-2-41437-000
30 × 30 × 3 cm/11.8 × 11.8 × 1.2 in	XAC-3-41438-000
30 × 30 × 4 cm/11.8 × 11.8 × 1.6 in	XAC-4-41439-000
30 × 30 × 5 cm/11.8 × 11.8 × 2.0 in	XAC-5-41440-000
30 × 30 × 8 cm/11.8 × 11.8 × 3.1 in	XAC-8-41441-000
30 × 30 × 10 cm/11.8 × 11.8 × 3.9 in	XAC-10-41442-000

Contrast Detail Phantom

Concentration resolution evaluation from two directions in plain X-ray



Dimensions

Hole 15: 15 × 15 holes of depth range from 1.0 to 8.0 mm (0.4 to 3.1 in)
Rod 15: 15 × 15 rods of height range from 1.0 to 8.0 mm (0.4 to 3.1 in)
Hole 10: 10 × 10 holes of depth range from 1.0 to 5.5 mm (0.4 to 2.2 in)
Rod 10: 10 × 10 rods of height range from 1.0 to 5.5 mm (0.4 to 2.2 in)

Set Includes

- 1 chart phantom
- storage case

Product Code

Contrast Detail Phantom - Hole 15	KK1-PH-16-41318-000
Contrast Detail Phantom - Hole 10	KK1-PH-16-41318-010
Contrast Detail Phantom - Rod 15	KK1-PH-16-41319-000
Contrast Detail Phantom - Rod 10	KK1-PH-16-41319-010

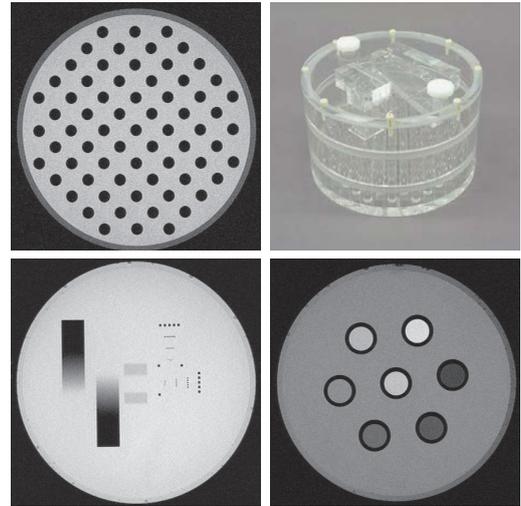
MRI Quality Assurance Phantom MHR / JMR II

Available to high magnetic fields up to 3T, allows the evaluations of slice thickness, spatial resolution, uniformity, and geometric distortion as well as contrast

PH-31 MHR: compiled with NEMA standards



PH-32B JMR 2



Features

- Uniformity is maintained under the high magnetic field of 3.0 Tesla
- Uniformity provides high precision evaluation for other parameters

Applications

- MRI

PH-31 MHR

Evaluation Parameters

- Signal-to-noise ratio (SNR)
- Image uniformity
- RF uniformity
- Spatial resolution
- Spatial linearity
- Slice thickness
- Slice position / separation
- Image contrast
- Image artifact

PH-32B JMR 2

Evaluation Parameters

- Signal noise ratio (SNR)
- Image uniformity
- Slice thickness
- Spatial resolution
- Geometric distortion
- Ghost
- Image contrast

Set Includes

1 phantom unit A
1 phantom unit B
1 liquid paraffin
1 spout
5 NiCl 50ml (5, 10, 15, 20, 25 mmol)
7 sample bottle (13.5ml)

1 funnel
1 petroleum jelly
1 screwdriver
1 extra screws
1 storage case manual

Set Includes

1 phantom unit A
1 phantom unit B
1 liquid paraffin
1 spout
3 NiCl 50ml (5, 10, 15 mmol)
3 sample bottle (9ml)

1 funnel
1 petroleum jelly
1 screwdriver
1 extra screws
1 storage case manual

Materials

acrylic resin, MRI contrast solution: nickel dichloride (NiCl)

Dimensions

Dimensions: 22 dia. × 14(H) cm × 2 types 8.7 dia. × 5.5 in

Product Code

MRI Quality Assurance Phantom MHR KK1-PH-31-41330-000

Materials

Acrylic resin, MRI solution:

Dimensions

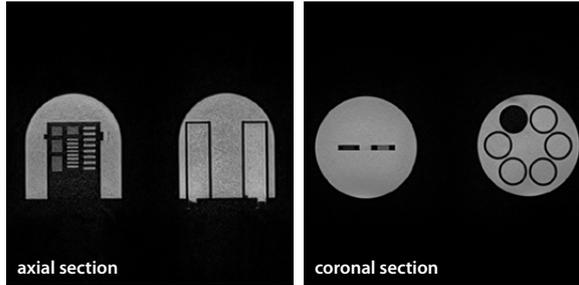
Dimensions: 18 dia. × 16(H) cm 7.1dia. × 6.3 in

Product Code

MRI Quality Assurance Phantom JMR 2 KK1-PH-32B-41330-030

MRI Breast QA phantom

An innovative phantom in the shape of breasts for detailed QA in Breast MRI



Features

- Quantitative evaluation of Breast MRI with breast coils
- Adjustable height of the phantoms in the range of 10cm to fit the depth of the coils
- Horizontal position of the phantoms can be set arbitrarily on the 30cm length slit

Test Summary

- Spatial resolution
- Quantitative evaluation of ADC on test pieces of tissue substitute

Product Code

MRI Breast QA phantom

KK1-PH-72-41936-000

Applications

- MRI

Set Includes

- | | |
|---|---|
| 1 | breast MRI evaluation unit
(2 types, 1 each) |
| 1 | adjustment bolt |
| 1 | supporting plate |
| 1 | storage case |

Materials

Acrylic resin

Dimensions

30×40×26 cm, 5kg
11.8×15.7×10.2 in, 11 lb

MRI Head Phantom NH

Life-size head phantom to assess uniformity



Applications

- MRI
- SPECT/CT
- CT

Dimensions

Phantom size:
W17×D22×H30 cm
W6.7×D8.6×H11.8 in

Set Includes

- | | |
|---|--------------------------|
| 1 | head phantom |
| 1 | nickel chloride solution |
| 1 | spout |
| 1 | storage case |
| | manual |

Product Code

MRI Head Phantom NH

KK1-PH-33-41330-010

Materials

- Acrylic resin

MRI/NM Head Phantom BHC

Simulate life-size head images in MRI and NM



Applications

- MRI
- SPECT/CT
- CT

Dimensions

Phantom height:
33 cm / 12.9 in

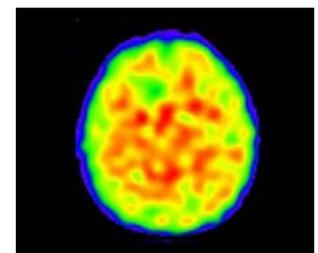
Set Includes

- | | |
|---|--------------------------|
| 1 | head phantom |
| 2 | simulated tumors |
| 1 | nickel chloride solution |
| 1 | storage case |

Product Code

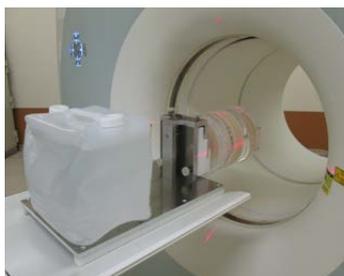
MRI/NM Head Phantom BHC

KK1-PH-34-41501-000



SPECT QA Phantom JSP

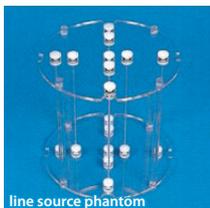
For daily quality control in SPECT and PET imaging



Optional parts: holder



outer phantom



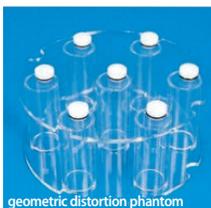
line source phantom



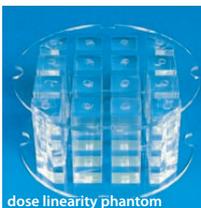
cold spot phantom



hot spot phantom



geometric distortion phantom



dose linearity phantom

Features

- A set of test units for daily QA of SPECT/PET

Evaluation Parameters

- Uniformity
- Spatial resolution
- Dose linearity
- Image distortion

Set Includes

- | | |
|--|------------------------|
| 1 outer phantom | 1 petroleum jelly |
| 1 line source phantom | 1 screwdriver |
| 1 cold spot phantom | 3 kinds of extra screw |
| 1 hot spot phantom | 1 injection needle |
| 1 dose linearity phantom | 1 storage case |
| 1 geometric distortion phantom | 1 manual |
| 1 angle adjustment holder (table-top type) | |

Applications

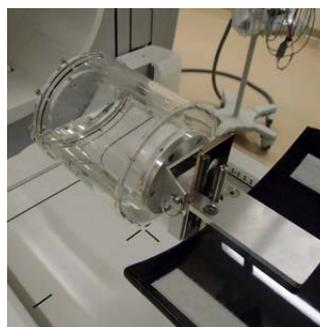
- SPECT and PET

Materials

Acrylic resin

Holder and Accessories

Specify the manufacturer and type of the scanner



Dimensions

30×40×26 cm, 5kg
11.8×15.7×10.2 in, 11 lb

Product Code

SPECT QA Phantom JSP	KK1-PH-28-41535-100
Holder and Accessories	KK1-PH-28-41535-110

Brain Phantom IB-20 advanced

For uptake ratio calibrations and studying the L-123DaTSCAN scatter correction techniques



Features

- This brain phantom of the striatal region with replicated skull densities of a male and female is useful for uptake ratio calibrations and studying the I-123 DaTSCAN scatter correction techniques

Applications

- SPECT, PET

Set Includes

- | | |
|--|-------------------|
| 2 bone scatterer cases:
adult male:
equivalent HU750 | 1 Velcro tape |
| elderly female:
equivalent HU530 | 1 petroleum jelly |
| 1 brain striatum phantom | 1 storage case |
| 1 screwdriver | manual |

Materials

- Brain striatum: epoxy resin
- Brain striatum container: urethane resin
- Cerebral ventricle: urethane resin
- Brain stratum phantom cover: acrylic
- Bone scatterer case: epoxy resin

Dimensions

Phantom size:
W21×D15×H8 cm
W8.2×D5.9×H3.1 in

Product Code

Brain Phantom IB-20 advanced KK1-PH-53-41918-000

Brain Phantom IB-10

Dual- fluid system to vary the absorption rate, and 5 cm thickness for the vertical setting of the camera



Applications

- SPECT, PET

Evaluation Parameters

- Homogeneity evaluation
- Cross calibration
- Gamma ray absorption rate by a skull
- Detectivity of gray matter and white matter
- Spatial resolution of negative images
- Radioactive concentration and linearity of SPECT value

Materials

- Acrylic resin/ urethane resin

Set Includes

- | |
|------------------------|
| 1 brain unit |
| 1 skull container unit |
| 1 J-Jack unit |
| 1 sectioned unit |

Dimensions

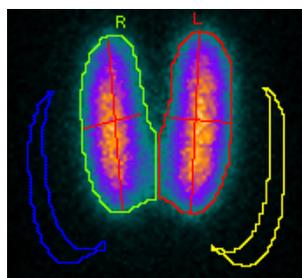
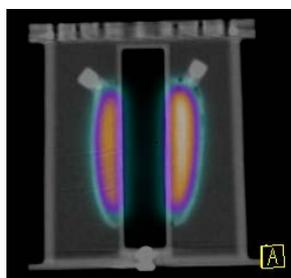
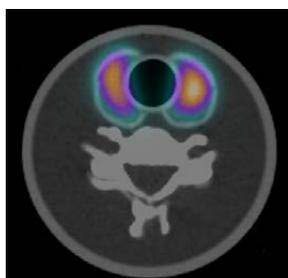
Phantom size:
W21×D15×H8 cm /
W8.2×D5.9×H3.1 in

Product Code

Brain Phantom IB-20 KK1-PH-27-41530-000

Thyroid Phantom UN

Five varying volumes of precision containers allow for various cases of measurement



Features

- The set of the phantoms facilitate evaluation of the RI uptake of the thyroid and the assessment of its function. The phantom also serves for dosimetry study in internal exposure.
- 5 kinds of thyroid grand (40,30,21,17,15 cc)
- Synthetic cervical vertebrae as a scatteration
- Infusing radiopharmaceuticals

Applications

- SPECT, PET

Anatomy

Cervical spine C3 to C7

Thyroid 1	14.7 ml
Thyroid 2	16.7 ml
Thyroid 3	20.7 ml
Thyroid 4	30.2 ml
Thyroid 5	39.0 ml

Materials

Container: acrylic resin
 Synthetic bone: epoxy resin
 Thyroid: acrylic resin

Set Includes

- 1 outer phantom
- 1 thyroid containers
- 1 thyroid (cold spot)
- 1 cervical spine

- 1 trachea tube
- 1 storage case
- 1 manual

Dimensions

Phantom size:
 13 dia. × H11.6 cm
 5.1 dia. × H4.6 in

Phantom weight:
 0.85 kg
 1.87 lb

Product Code

Thyroid Phantom UN

KK1-PH-69-41930-000

ORINS Thyroid Phantom ITS

A phantom by the ORINS standards



Features

- Oak Ridge Institute for Nuclear Studies type phantom for measurement of thyroid radionuclide uptake
- Cavities for iodine-131 are prepared in the neck phantom

Materials

- Acrylic resin

Dimensions

Phantom size:
12.5 dia. x 12.5 (H) cm /
4.9dia. x 4.9(H) in

Applications

- SPECT

Set Includes

- 1 petroleum jelly
- 1 screwdriver
- 1 storage case
- 1 manual

Product Code

ORINS Thyroid Phantom ITS

KK1-PH-26-41503-000

ECT Hot Cold Phantom SP-6

Experience an innovative phantom with five crafted sphere containers, tailored for optimal dosimetry in PET/SPECT



Features

- Five sphere containers with different sizes can be filled with RI solution
- Volume of sphere phantoms are:
- 50 mm/2 in (100%), 80%, 60%, 40% and 20%

Materials

- Acrylic resin

Dimensions

Phantom size:
21 dia. x 16 (H) cm /
8.2 dia. x 6.2 (H) in

Applications

- SPECT, PET

Set Includes

- 1 phantom
- 1 storage case

Product Code

ECT Hot Cold Phantom SP-6

KK1-PH-29-41540-030

PET Body Phantom (NEMA-IEC)

Basic phantom for whole body PET image quality and quantification accuracy of source ACTIVITY concentrations and PET/CT registration accuracy



Features

- Complies with IEC 61675-1 and NEMA NU 2-2018
- Six sphere shaped fillable targets
- A column in the center of the phantom to simulated the lung



Applications

- Evaluation of PET image
- Evaluation of radioisotope
- Accuracy of specific activity of radioisotopes

Set Includes

- 1 body phantom with lung column
- 1 funnel
- 1 syringe
- 1 petroleum jelly
- 1 set of screws
- 1 carrying case

Dimensions

W30×D20×H23 cm
W11.8×D7.9×H9.1 cm

Weight: 2.6 Kg/ 5 lb

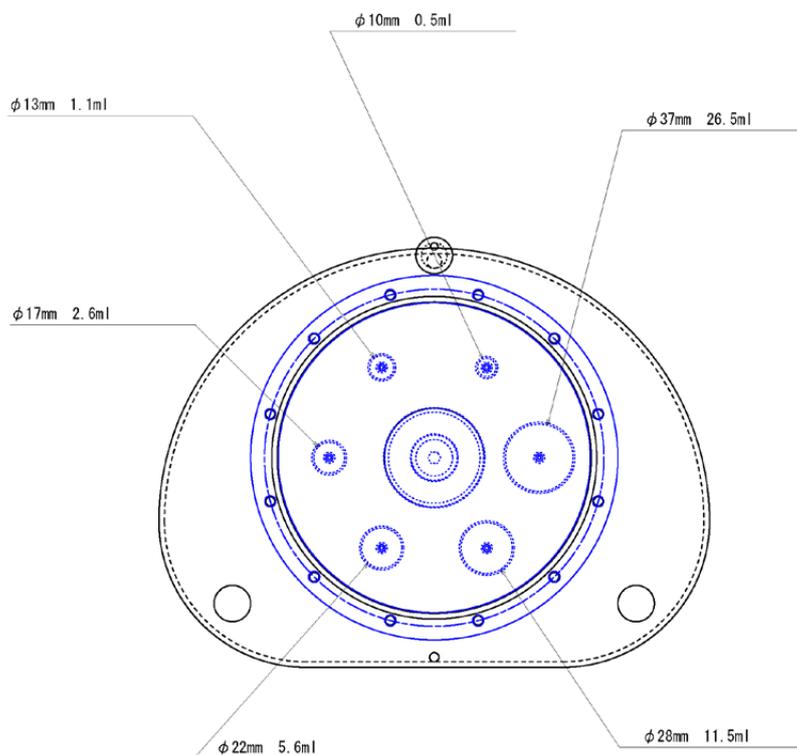
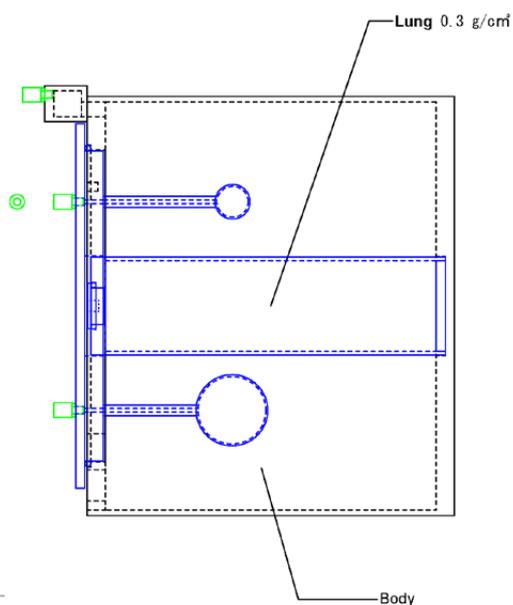
Materials

- Acrylic resin

Product Code

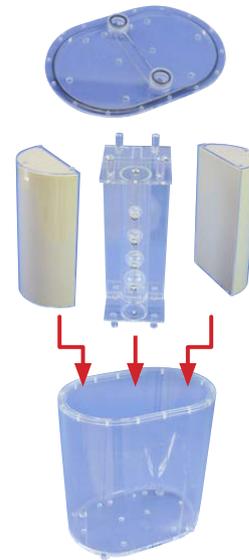
ORINS Thyroid Phantom ITS

KK1-PH-26-41503-000



Bone Scintigraphy Quality Assurance Phantom

The world first standard QA phantom for Bone Scintigraphy, Bone SPECT/CT and NaF-PET



Features

- The phantom can represent either thoracic or lumbar region by changing the filling of side cavities

Visual Evaluation

- Tumor detectability
- Image distortion
- Artifact

Quantitative Evaluation

- Contrast and count ratio between vertebral body and tumor
- Concentration linearity and recovery coefficient in the tumor
- Statistical noise
- FWHM at the spinous process (relative index of resolution)

Applications

- Bone scintigraphy
- Bone SPECT/CT
- NaF-PET

Other

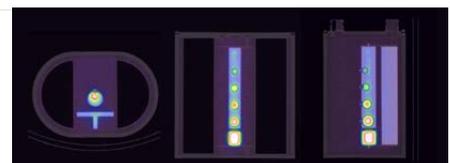
- Verification of scattering correction and attenuation correction



CT



SPECT



SPECT/CT

Set Includes

- 1 phantom
- 1 screwdriver
- 1 funnel

- 1 petroleum jelly
- 1 needle manual

Materials

- Acrylic resin
- Tough lung (PVA acetal compound)

Dimensions

Phantom size:

OD: W310×D210×H355 mm
W12.2×D8.2×H14 in

ID: W290×D190×H300mm
W11.4×D7.5×H11.8 in

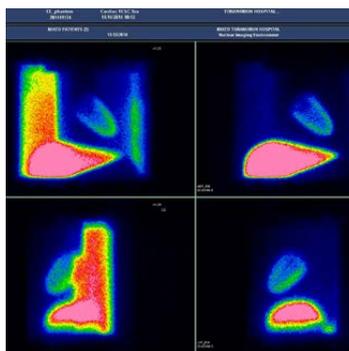
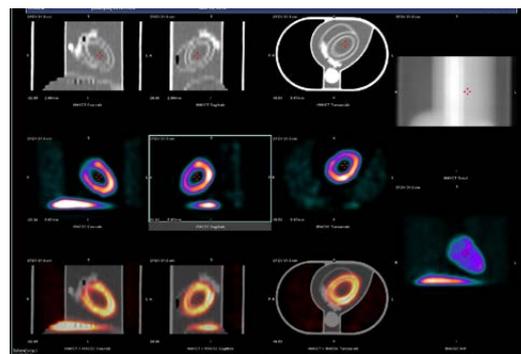
Product Code

Bone Scintigraphy QA Phantom

KK1-PH-74-41938-000

Myocardial Phantom HL

For researches of the impact of elevated radio accumulation in the liver on myocardial SPECT images for in-depth analysis



Features

- Allows the study of RI liver intake and its effect on the myocardial SPECT
- Cold defect can be set in the left cardiac muscle
- Background can be set individually in lung field, mediastinum and right ventricle

Applications

- SPECT

Visual Evaluation

- Tumor detectability
- Image distortion
- Artifact

Quantitative Evaluation

- Contrast and count ratio between vertebral body and tumor
- Concentration linearity and recovery coefficient in the tumor
- Statistical noise
- FWHM at the spinous process (relative index of resolution)

Other

- Verification of scattering correction and attenuation correction

Set Includes

1 main phantom body	1 stomach
1 right lung	1 heart
1 left lung	1 work base
1 mediastinum	1 screwdriver
1 liver	1 petroleum jelly
	1 storage case

Materials

- Main Container: Acrylic Resin
- Spine: Epoxy Resin (similar to human in HU)
- Heart: Acrylic Resin, Acrylic resin
- Lung: Foamed Resin, Water
- Screw: Polyacetal Resin

Dimensions

Phantom size:
W32×D22×H31 cm /
W12.5×D8.6×H12.2 in

Phantom weight:
7.1 kg / 15.6 lb

Packing size:
W44×D39×H42 cm
W17.3×D15.3×H16.5 in

Packing weight:
12.5 kg / 27.5 lb

Product Code

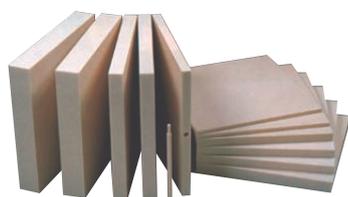
Myocardial Phantom HL

KK1-PH-24-41333-000

Tough Phantom Series

An enduring, superior-quality phantom that remains stable and shatter-free, designed to elevate precision in the realm of radiotherapy planning

Tough Water Phantom WD



Human tissue substitute phantoms with water equivalent physical properties

WD-3002	300×300×2 mm/ 12×12×0.08 in	WD-4003	400×400×3 mm/ 16×16×0.12 in
WD-3003	300×300×3 mm/ 12×12×0.12 in	WD-4005	400×400×5 mm/ 16×16×0.2 in
WD-3005	300×300×5 mm/ 12×12×0.2 in	WD-4010	400×400×10 mm/ 16×16×0.4 in
WD-3010	300×300×10 mm/ 12×12×0.4 in	WD-4015	400×400×15 mm/ 16×16×0.6 in
WD-3015	300×300×15 mm/ 12×12×0.6 in	WD-4020	400×400×20 mm/ 16×16×0.8 in
WD-3020	300×300×20 mm/ 12×12×0.8 in	WD-4025	400×400×25 mm/ 16×16×1.0 in
WD-3025	300×300×25 mm/ 12×12×1.0 in	WD-4030	400×400×30 mm/ 16×16×1.2 in
WD-3030	300×300×30 mm/ 12×12×1.2 in	WD-4040	400×400×40 mm/ 16×16×1.6 in
WD-3040	300×300×40 mm/ 12×12×1.6 in	WD-4050	400×400×50 mm/ 16×16×2.0 in
WD-3050	300×300×50 mm/ 12×12×2.0 in		
WD-4002	400×400×2 mm/ 16×16×0.08 in		

Material: Epoxy resin

Tough Water Phantom WD

KK1-PH-40

Tough Bone Phantom BE-T, BE-H, BE-NWD



Human bone substitute phantoms to simulate body structure in combination with PH-40 and PH-42

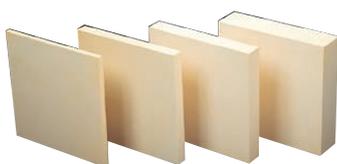
BE-T-2005	Compact Bone 200×200×5mm/ 8×8×0.2 in	BE-N-2020	Inner Bone 200×200×20 mm/ 8×8×0.8 in
BE-T-2010	Compact Bone 200×200×10mm/ 8×8×0.4 in	BE-H-3005	Cortical Bone 300×300×5 mm/ 12×12× 0.2 in
BE-T-2020	Compact Bone 200×200×20mm/ 8×8× 0.8 in	BE-H-3010	Cortical Bone 300×300×10mm/12×12×0.4 in
BE-H-2005	Cortical Bone 200×200×5 mm/ 8×8×0.2 in	BE-H-3020	Cortical Bone 300×300×20 mm/ 12×12×0.8 in
BE-H-2010	Cortical Bone 200×200×10mm/ 8×8×0.4 in	BE-N-3005	Inner Bone 300×300×5 mm / 12×12×0.2 in
BE-H-2020	Cortical Bone 200×200×20mm / 8×8×0.8 in	BE-N-3010	Inner Bone 300×300×10 mm / 12×12×0.4 in
BE-N-2005	Inner Bone 200×200×5 mm/ 8×8×0.2 in	BE-N-3020	Inner Bone 300×300×20 mm / 12×12×0.8 in
BE-N-2010	Inner Bone 200×200×10 mm/ 8×8×0.4 in		

Material: Epoxy resin

Tough Bone Phantom BE-T, BE-H, BE-NWD

KK1-PH-41

Tough Lung Phantom LP



Human lung substitute phantoms to simulate body structure in combination with PH-40 and PH-41

LP-3010	300×300×10 mm / 12×12×0.4 in
LP-3020	300×300×20 mm / 12×12×0.8 in
LP-3030	300×300×30 mm / 12×12×1.2 in
LP-3050	300×300×50 mm / 12×12×2.0 in

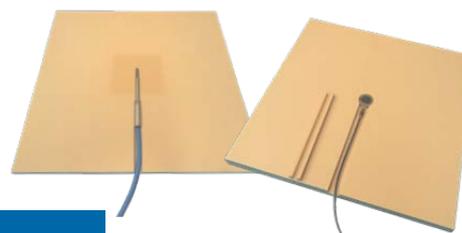
Material: Phenolic resin

Tough Lung Phantom LP

KK1-PH-42

Dosimetry cavities

Tough series phantoms can be ordered with cavities and plugs. Specify your chamber's manufacturer and model number. Let us have dimensional drawings of the chambers you are using to estimate cost.



Specify the type of processing

1. Sandwich type (for pencil type)
2. Cylinder hole type (for pencil type)
3. Shallow type (for plain parallel type)

Specify your chamber's manufacturer and model number

Phantoms for therapeutic energy range

Comparison of Physical Properties

	human soft tissue	muscle	fat	cartilage	lung
electron density ($\times 10^{23}e/g$)	3.29	3.31	3.34	3.28	3.31
effective atomic number	7.03	7.45	6.33	7.89	7.49
specific gravity	1.00	1.05	0.95	1.10	0.26

ICRU publication 23 (Reference man)

	water	acryl	Tough Water Phantom WD	Tough Bone Phantom BE-T	Tough Bone Phantom BE-H	Tough Bone Phantom BE-N	Tough Lung Phantom LP
electron density ($\times 10^{23}e/g$)	3.343	3.248	3.265	3.108	3.154	3.213	3.211
effective atomic number	7.417	6.467	7.328	13.179	11.697	9.141	7.242
specific gravity	1.000	1.180	1.018	1.730	1.500	1.240	0.370

	Tough Water Phantom WD	Tough Bone Phantom BE-T	Tough Bone Phantom BE-H	Tough Bone Phantom BE-N	Tough Lung Phantom LP
H	8.63	3.69	5.11	6.97	7.00
C	68.89	29.22	42.45	60.03	50.20
N	2.18	1.19	1.73	2.45	—
O	17.88	32.66	28.13	21.79	35.10
P	—	10.24	7.00	2.30	0.10
Cl	0.15	0.06	0.09	0.13	1.00
Ca	2.27	22.92	15.49	6.33	—
Al	—	—	—	—	1.50
Si	—	—	—	—	5.00

Therapy Body Phantom THRA-1

THRA-1 is an anthropomorphic, cross sectional dosimetry phantom for therapeutic energy range



Features

- This phantom is a therapy planning phantom made of Tough Phantom Series human tissue substitutes
- Sizes and spacing of dosimeter cavities and slice thickness may be custom ordered

Dimensions

Phantom height:
80 cm / 31.6 in

Phantom weight:
33 kg / 72.7 lb

Slice thickness:
3 cm / 1.2 in

Dosimeter holes:
in lattice-like pattern of 3×3 cm / 1.2×1.2 in

Product Code

Therapy Body Phantom THRA-1

KK1-PH-37-41480-000

Materials

- Body: Tough Water WE-211 (epoxy resin)
- Bone: Tough Bone BE-303
- Lung: Tough Lung LP-430

Set Includes

- 1 phantom
- 1 supporting frame
- insert rods for dosimeter holes
- 1 storage case
- manual

Pediatric Therapy Body Phantom THRA-2

THRA-2 is an anthropomorphic, cross sectional dosimetry phantom for therapeutic energy range



Features

- Unlike conventional radiotherapy phantoms, synthetic bones with unified size are used so that there are no differences of size by using human bones
- Easy to compare data between facilities
- Tumor targets can be attached as options

Dimensions

Phantom height:
60 cm / 23.6 in

Product Code

Pediatric Therapy Body Phantom THRA-2

KK1-PH-38-41480-010

Materials

- Body: Tough Water WE-211 (epoxy resin)
- Bone: Tough Bone BE-303
- Lung: Tough Lung LP-430

Set Includes

- 1 phantom
- 1 supporting frame
- insert rods for dosimeter holes
- 1 storage case
- manual

Ultrasound Examination Training Model 'ABDFAN'



Unique high-fidelity ultrasound phantom facilitates effective training in abdominal ultrasound scanning with your own clinical devices. Simulated lesions embedded as targets provide wider educational opportunities.



KK1-US-1B

Features

- Inanimate tool for training of a novice to demonstration by an expert.

Any ultrasound device with a convex probe can be used.

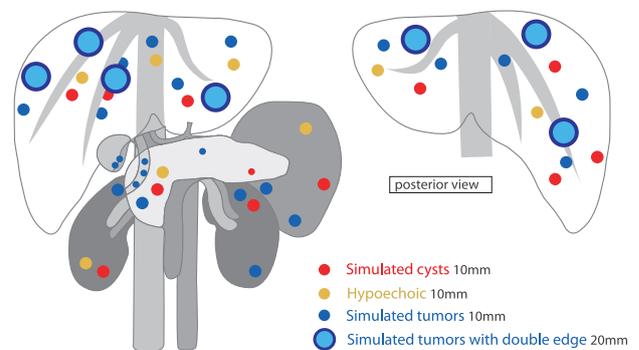
Detailed hepatobiliary, pancreatic and other abdominal anatomy meeting requirement for excellent training; eight Couinaud's hepatic segments can be localized.

Various simulated lesions including biliary stones and cysts, solid tumours (hypoechoic, hyperechoic and target appearance) in the liver, pancreas, spleen and kidneys.

Near real-size organs, structures and abnormal lesions.

Durable long-life phantom materials.

- Four variations of simulated lesions enrich training application.



Simulated lesions in liver, pancreas, kidney, spleen and gallbladder.



Tutorial Manual



DVD

Specifications

Phantom Inclusions

- Liver (segmental anatomy, portal and hepatic venous systems, ligamentum teres and ligamentum venosum), biliary tract (gallbladder, cystic duct, intrahepatic and extrahepatic bile ducts)
- Pancreas (pancreatic duct), spleen, kidneys, detailed vascular structures (aorta, vena cava, celiac artery and its branches, portal vein and its branches)
- Superior mesenteric vessels, renal vessels, etc)

Pathology Inclusions

- Hepatic lesions (cystic and solid), gallbladder and bile duct stones
- Pancreatic tumours (one invading the portal vein)
- Splenic lesions, both kidney lesions, and left adrenal tumour

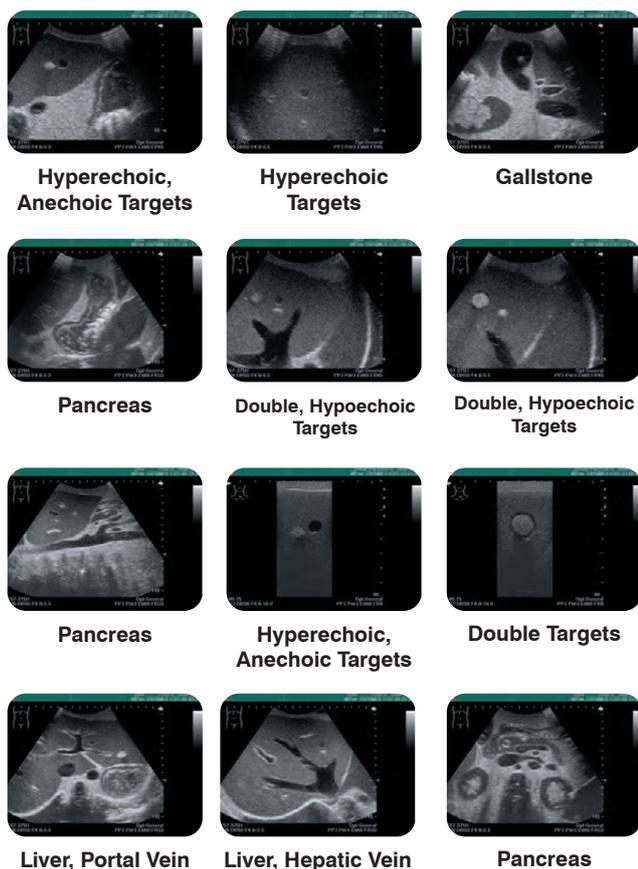
Set Inclusions

- 1 ultrasound phantom "ABDFAN"
- 1 set of positioning pillow
- 1 carrying case

Size, Weight and Materials

- 18 x 25 x 28 cm
- 12 kg
- Urethane elastomer

*Full set: added 1 Anatomical model "ECHO-ZOU".



Repetitive Training With Actual Clinical Devices

- Ready-to-use simplicity provides more training opportunities to larger numbers of trainees.
- Stable and long-life phantom material brings reproducible results.
- The phantom can be scanned at any body part of its surface.

Training Items

- Instrumentation and probe manipulation
- Basics of abdominal sonography:

Cross sections and sonography anatomy

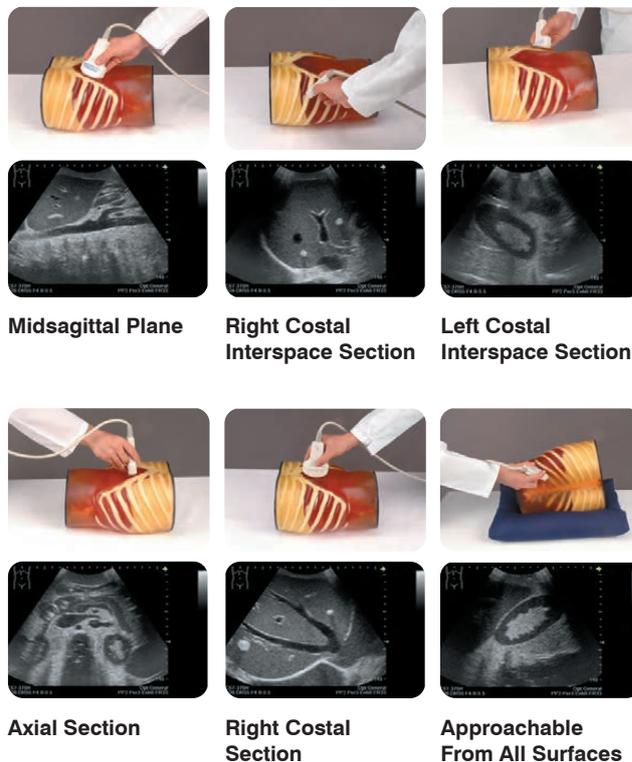
Sonographic demonstration of each individual organ

Localisation of hepatic Couinaud's segments

Lesion detection training

Ultrasound Examination Training Model

KK1-US-1B



Fully Three Dimensional Approach

- Detailed anatomy with approximate-to-human echogenicities.
- Organs are based on cadaver mold and then modeled to realise right anatomy under ultrasound scanning.
- The phantom posture is designed to make the depth of the organs from the probe close to clinical setting.
- 'Echo-Zou', a disassemblable anatomical model for relevant organs facilitates three dimensional understanding of sectional images.

Ultrasound Examination Training Model 'ECHOZY'

To grasp the relationship between the anatomical structure and probe manipulation is one of the most challenging problems for novice operators. In actual situations, speedy examination will be required as well. This training set facilitates the acquisition of fundamental skills, providing a clear understanding of complex anatomy around the porta hepatis.

From basic knowledge of ultrasound screening to hands-on training in clinical procedures and screening of individual organ systems.

- Effective combination of the phantom and anatomical model ECHO-ZOU
- Repetitive standardized training is possible using actual clinical devices
- State of art anatomy of upper abdomen organs
- The phantom posture is designed to make the depth of the organs form the probe approximate to actual clinical scanning
- Eight Couinaud's segments of the liver can be recognized
- Sturdy and stable phantom material
- Ideal education tool for interns, residents and technologists

Ultrasound Examination Training Model 'ECHOZY' KK1-US-1



KK1-US-1



Features

- Upper abdomen organs with approximate-to-human echogenicities
- State-of-art anatomy fulfils medical sonographers' high requirements
- Unique long-life phantom materials
- Advanced version with targets (pathologies) is available

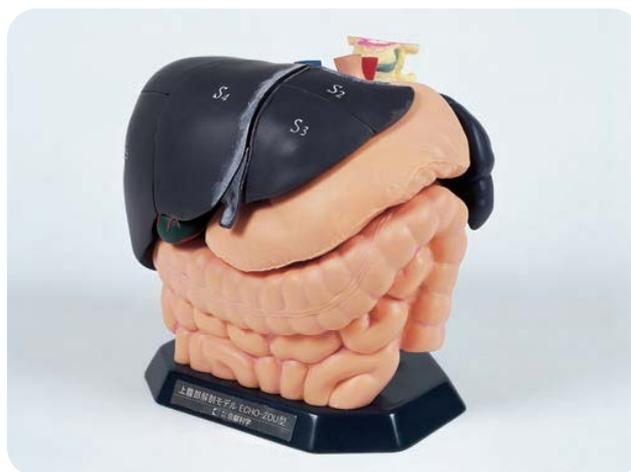
"ECHOZY" abdominal set includes an ultrasound abdomen phantom and a life-size anatomical model 'ECHO-ZOU', which make an effective combination as educational tool in ultrasound scanning, as well as time-saving approach for anatomy teaching.



Internal organ anatomical model ECHO-ZOU

Separates into 20 parts:

- 1) Hepatic segment S1: caudate lobe
- 2) Hepatic segment S2: upper left lateral segment
- 3) Hepatic segment S3: lower left lateral segment
- 4) Hepatic segment S4: left medial segment
- 5) Hepatic segment S5: lower right anterior segment
- 6) Hepatic segment S6: lower right posterior segment
- 7) Hepatic segment S7: upper right posterior segment
- 8) Hepatic segment S8: upper right anterior segment
- 9) Portal vein, bile duct and hepatic vein
- 10) Gallbladder
- 11) Pancreas
- 12) Spleen
- 13) Right kidney
- 14) Left kidney
- 15) Abdominal aorta
- 16) Inferior vena cava
- 17) Hepatic veins
- 18) Spinal column
- 19) Stomach
- 20) Large intestine, small intestine



'ECHOZY' Abdomen II: Cysts and simulated tumour targets are embedded

Specifications

Inclusions

- US-1 Ultrasound Examination Training Model "ECHOZY" abdominal set
- 1 ultrasound abdominal phantom

Embedded organs: chest bones, lungs (no internal structure), heart (no internal structure), liver, portal vein, bile duct, hepatic artery, gallbladder, pancreas, spleen, kidneys, abdominal aorta, inferior vena cava, hepatic veins, spinal column and stomach

- 1 internal organ anatomical model ECHO-ZOU
- 2 silicon sheets
- 1 set of positioning pillows
- 1 talcum powder
- 1 carrying case

Size

- Phantom size: 18 x 25 x 28H cm, 12 kg
- ECHO-ZOU size: 16 x 23 x 16H cm, 2.9 kg
- Packing size: 30 x 70 x 50H cm, 20 kg

Materials

- Ultrasound phantom: Urethane elastomer
- ECHO-ZOU model: Urethane



Normal Accurate Cerebral Anatomy



US-14a

Accurate depiction of anatomy facilitates a realistic user experience with its life-like soft touch

US-14a

- Skull
- Anterior fontanel
- Posterior fontanel
- Cerebrum
- Cerebellum
- Brain-stem
- Lateral ventricle
- Ventricle
- Third cerebroventricle
- Fourth ventricle
- Septum lucidum

Normal Accurate Cerebral Anatomy

KK1-US-14a

Abnormal Hydrocephalus



US-14b

With hydrocephalus, the shape of the skull is altered due to intracranial pressure.

S-14b

- Skull
- Anterior fontanel
- Posterior fontanel
- Hypertrophied lateral ventricle

Abnormal Hydrocephalus

KK1-US-14b



Breast Ultrasound Examination Phantom “Breast Fan”

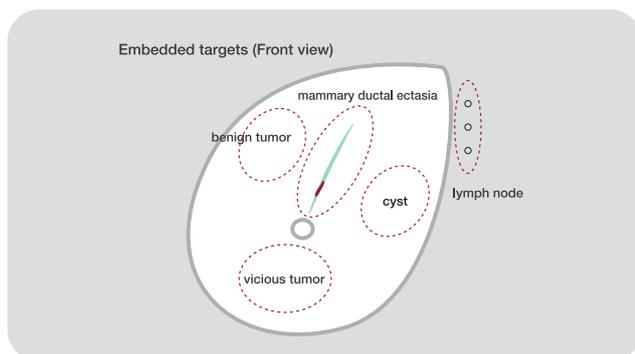
A unique phantom for training in basic breast ultrasound examination. Simulated targets with different echogenicities are embedded in the mammary gland. In this phantom you may visualise the following: the subcutaneous adipose, the mammary gland, the galactophore, Cooper’s ligament, the retromammary adipose, the costae, the clavicle, the pectoralis major, the lung, and the lymph nodes at axilla.

Breast Ultrasound Examination Phantom

KK1-US-6



KK1-US-6



Set includes:

- 1 Breast Phantom
- 1 carrying case
- 1 tutorial manual (DVD)

Phantom Size:

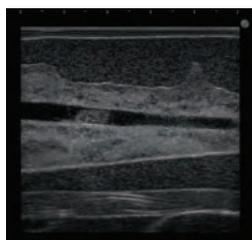
approx, 19x22x7H cm, 3.6kg

Packing Size:

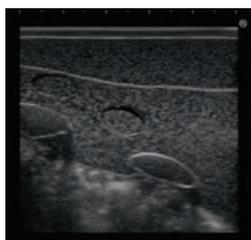
approx, 35x36x24H cm, 6kg



Vicious Tumor



Mammary Ductal Ectasia



Lymph Nodes



Benign Tumor



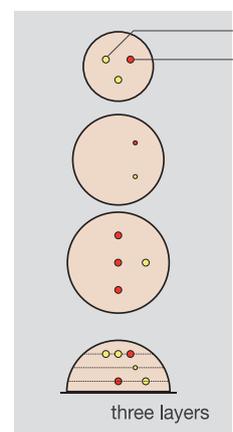
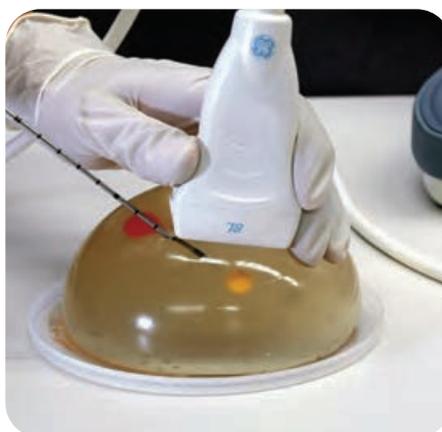
Cyst

Biopsy Training Model

We would like to introduce to you the new training phantom for ultrasound guided breast biopsy. Simulated lumps with different echogenicities can be aspirated by biopsy needles. This model provides a combination of hands-on and visual training. This phantom is fantastic training for the usage of the scanner and needle. The image is excellent quality.

High-echo target

Anechoic target



Fast/Acute Abdomen Phantom 'FAST/ER FAN'

Focused Assessment with Sonography or Trauma

This innovative phantom facilitates repetitive training of FAST as an adjunct to the ATLS primary survey.

Fast/Acute Abdomen Phantom KK1-US-5

Features

This phantom has been developed to provide simulated training in FAST (Focused Assessment with Sonography for Trauma); an ultrasound examination directed at identifying the presence of free intraperitoneal or pericardial fluid in the traumatic patients, which allows detecting the possible cause of shocks such as mass hemothorax, intraperitoneal hemorrhage or cardiac tamponade.

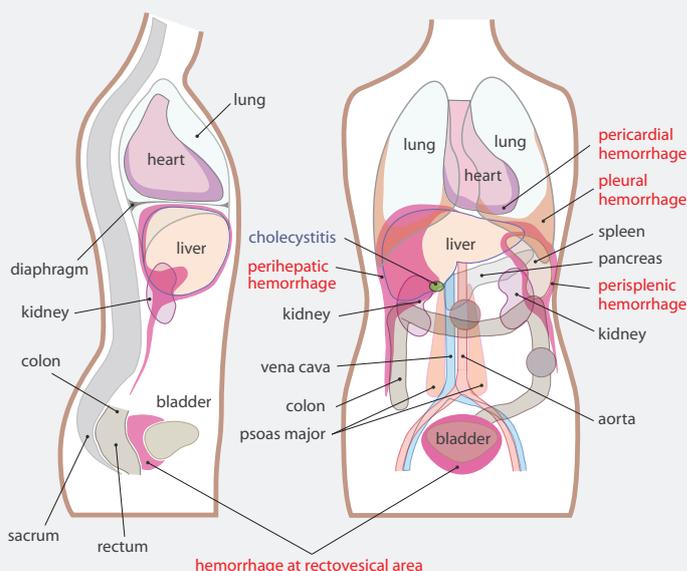
Training Items

- **FAST procedures:** Internal hemorrhage at perihepatic, perisplenic, pelvis and pericardium area.
- **Sonography for acute patients:** Internal hemorrhage at pericardial, bilateral chambers as well as intra-abdominal hemorrhage around the liver, the spleen and the urinary bladder. Pathologies including cholecystitis, an aortic aneurysm, a lesion on the colon.



KK1-US-5

- pericardial hemorrhage
 - pleural hemorrhage
 - intra-abdominal hemorrhage
 - Tumor
- *The small intestine is also embedded.



Fast and Acute Abdomen Pathology



1. Cardiac Tamponade



2. Right Upper Abdominal Bleeding



3. Left Upper Abdominal Bleeding



4. Pelvic Bleeding



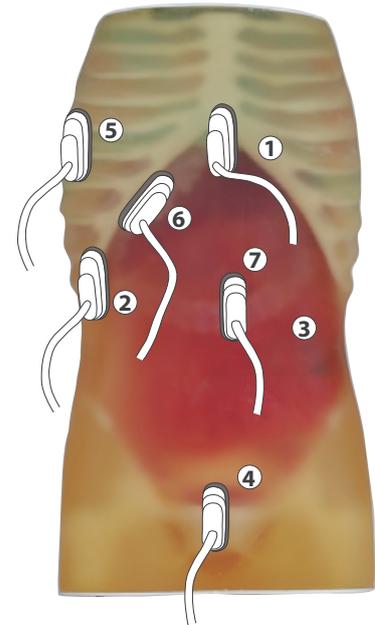
5. Pleural Bleeding



6. Peri-hepatic Bleeding



7. Abdominal Aortic Aneurysm



Specifications

Inclusions

- 1 ultrasound phantom with carrying case

Materials

- Soft tissue and organs: Urethane base resin
- Synthetic bones: Epoxy base resin

Size

- Phantom size: Approximately 40 x 80 x 31cm
- Phantom weight: Approximately 35 kg



Fetus Ultrasound Examination Phantom "SPACE FAN-ST"

The SPACEFAN-ST provides high quality training for routine second trimester screening. This phantom contains a 23 week fetus with full anatomy placed in the uterus that can be scanned with 2D and 3D transducers. The oval shape phantom abdomen can be set in four different positions to enrich the training variation. Included life-size fetus model facilitates demonstration and three dimensional understanding.



KK1-US-7



Fetus Ultrasound Examination

KK1-US-7

Training Items:

Fetal size assessment: BDP, AD, AC and FL
Confirmation of normal fetus situs Fetal anatomy assessment: head and brain, heart and lung, abdominal organs, spine and bones.

Placental localisation

Evaluation of amniotic fluid volume.

Anatomy

Uterus: amniotic fluid, placenta, umbilical cord, and a 23 week fetus (26cm).

Fetus: skeletal structure, brain with septum lucidum, heart with four chambers, lungs, spleen, kidneys, aorta, UV, UA, and the external genital.



BDP

AC

FL



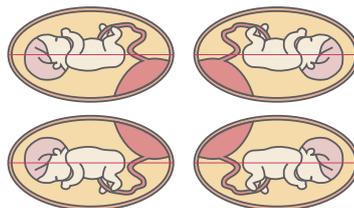
Heart with Four Chambers

UV

Umbilical Cord



Breech Position



Fetus Ultrasound Examination Phantom

Set Includes:

- 1 mother body torso
- 1 ultrasound pregnant uterus phantom
- 1 fetus demonstration model
- 1 carrying bag

Specifications

Phantom Size: approx, 40 x 29 x 22 cm

Weight: approx. 6kg.



Female Pelvic Ultrasound Phantom

Two interchangeable inserts to cover basic gyn ultrasound.

The pelvic phantom is unique in that it allows for transabdominal and transvaginal scanning. Though transvaginal scanning is the gold standard for gyn and 1st trimester pregnancy, it is still important to recognize the anatomy from the transabdominal aspect, as patients may present with anatomy and /or pathology that is outside the transvaginal field of view. The transabdominal technique is still a valuable part of assessing the female pelvis. This phantom also provides imaging of normal and abnormal anatomy so that normal protocol can be practiced while still learning to recognize life threatening pathology, such as an ectopic pregnancy. Other pathology such as endometrial cancer and ovarian cysts can also be identified. In a learning environment, this phantom provides a balance of normal and abnormal that will assist in developing the critical thinking skills necessary to successfully evaluate the female pelvis.



Features

1. Both transvaginal and transabdominal scanning are possible.
2. Two types of interchangeable phantom inserts with different pathologies
3. Realistic view of female external genital
4. Excellent ultrasound image quality

Training Skills

- Handling and manipulation of transvaginal and transabdominal transducers
- Interpretation of sonogram
- Visualization and localization of anatomies and pathologies

Set Includes

- 1 lower torso manikin
- 1 ultrasound pathology unit
- 1 ultrasound ectopic pregnancy unit
- 1 storage case
- Instruction manual

Specifications

Phantom Size: approx. W34xD33xH24cm

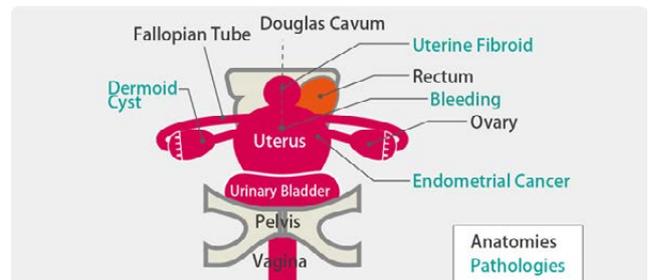
Weight: approx. 6.5kg

Female Pelvic Ultrasound Phantom

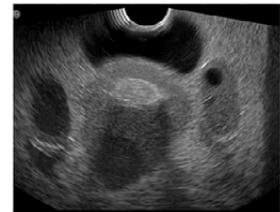
KK1-US-10

Pathological phantom

Endometrial cancer, uterine fibroid, dermoid cyst of ovary, bleeding at Douglas Cavum



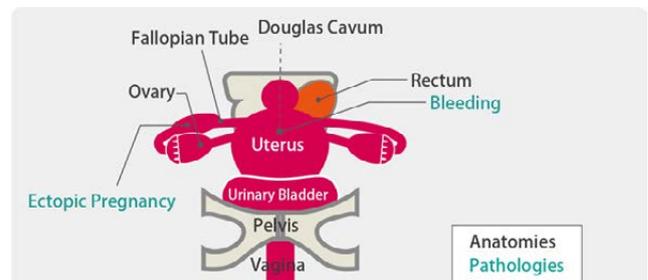
Transabdominal



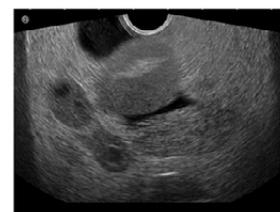
Transvaginal

Ectopic pregnancy phantom

Ectopic pregnancy in a fallopian tube, bleeding at Douglas Cavum



Transabdominal



Transvaginal

Scrotal Ultrasound Phantom

Repeated training to acquire skills in safe and painless examination.

Ultrasound evaluation of the scrotum is an effective, safe, and painless imaging method to assess male reproductive organs for tumors, inflammation, and trauma, as well as potential causes of infertility. The ultrasound phantom provides sonographers, residents in training, and physicians, with the opportunity for hands-on training with a scrotal phantom using an ultrasound scanner. Interchangeable normal and cancerous phantom inserts provide examples of anatomy and pathology of the male genitalia to simulate a real-time experience.



Features

1. Two types of interchangeable scrotums: normal and pathology
2. Excellent ultrasound image quality
3. Compatible with any ultrasound system

Training Skills

1. Patient positioning and preparation for examination
2. Scrotal ultrasound screening
3. Visualization of testicular cancer

Set Includes

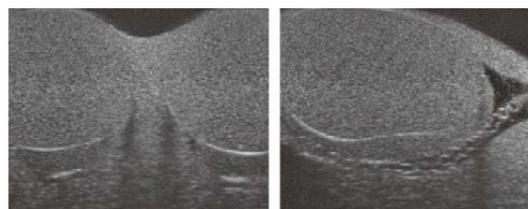
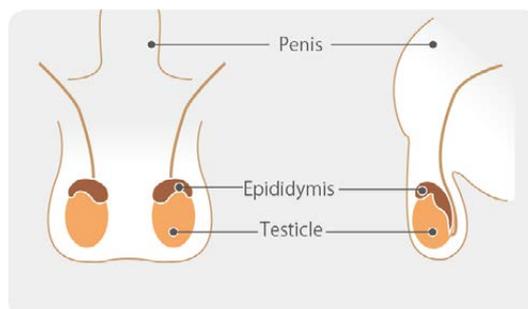
- 1 pelvic body
- 1 normal scrotum
- 1 pathological scrotum
- 1 storage care
- Instruction manual

Specifications

Phantom size:	approx. W34xD33xH24 cm
Weight:	approx. 6.5kg, 14.3lb

Normal Phantom

Scrotum, testicle, epididymis and penis

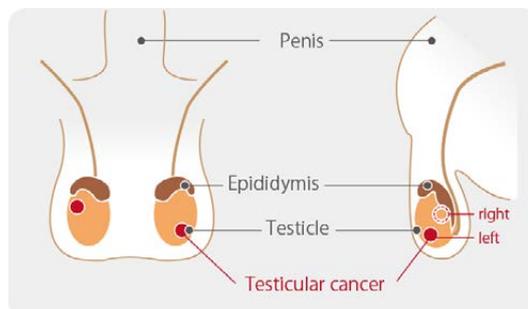


Normal

Pathological Phantom

Scrotum, testicle, epididymis and penis

Testicular cancer(each one in left and right testis, 10mm dia.)



Testicular Cancer

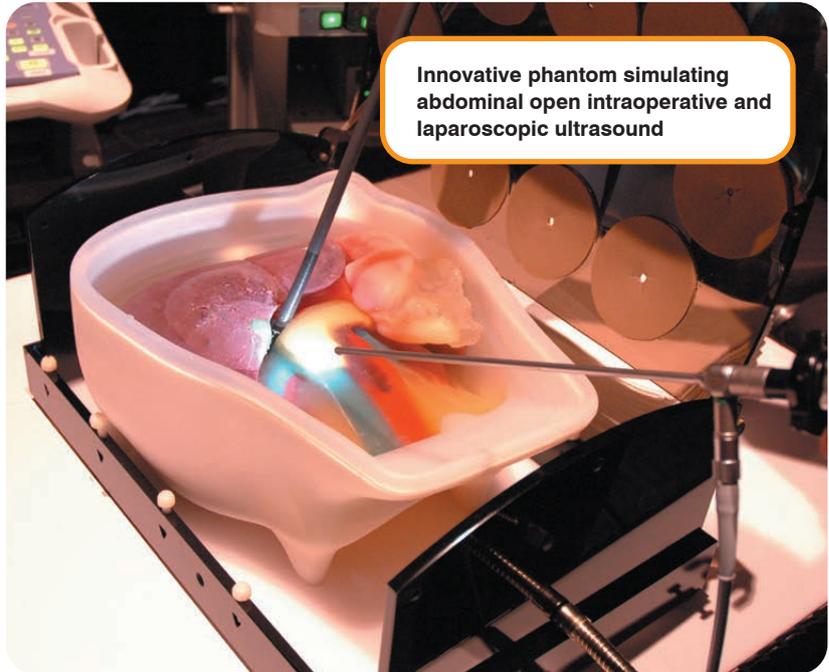
Abdominal Intraoperative and Laparoscopic Ultrasound Phantom “IOUSFAN”



Intraoperative Ultrasound (Open Surgery)



Laparoscopic Ultrasound



Innovative phantom simulating abdominal open intraoperative and laparoscopic ultrasound

KK1-US-3

Features

- Inanimate tool for training of novice to demonstration by an expert.
- Detailed abdominal anatomy meeting requirements for training: open intraoperative scanning of liver, biliary tract, pancreas; laparoscopic examination of biliary system for screening of stones and evaluation of hepatic and pancreatic lesions.
- Soft phantom materials allowing realistic probe manipulation.
- Various simulated lesions including biliary stones and cysts, solid tumours (hypochoic, hyperechoic and target-appearance) in the liver, pancreas, spleen and kidneys.
- Detachable stomach and duodenum allowing various scanning methods of the bile duct and pancreas.
- Container allowing water-immersion scanning for both contact and stand-off techniques, simulating real abdominal intraoperative and laparoscopic scanning (no ultrasound gel required).
- Near real-size organs, structures and abnormal lesions.
- Phantom fits in the laparoscopic trainer box so that laparoscopic ultrasound of organs is possible under direct laparoscopic view.
- Durable long-life phantom materials.

Abdominal Intraoperative and Laparoscopic Phantom KK1-US-3



Set includes:

- 1 x upper abdomen ultrasound phantom
- 1 x phantom container

Specifications

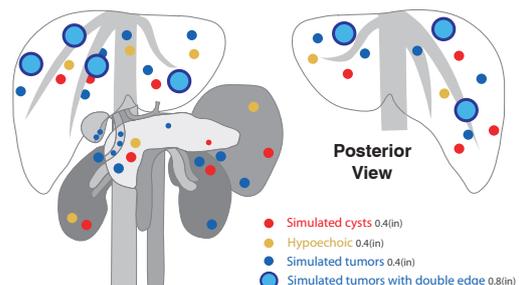
Phantom Inclusions

The liver (segmental anatomy, portal and hepatic venous systems, ligamentum teres and ligamentum venosum), biliary tract (gallbladder, cystic duct, intrahepatic and extrahepatic bile ducts), pancreas (pancreatic duct), spleen, kidneys and detailed vascular structures (aorta, vena cava, celiac artery and its branches, portal vein and its branches, superior mesenteric vessels, renal vessels, etc).

Pathology Inclusions

Hepatic lesions (cystic and solid), gallbladder and bile duct stones, pancreatic tumours (one invading the portal vein), splenic lesions, both kidney lesions and left adrenal tumour.

Simulated lesions in liver, pancreas, kidney, spleen, gallbladder



Ultrasound Guided Tube Feeding Phantom

Anatomically correct neck model for Ultrasound Guided Tube Feeding Training

Features

1. Anatomically correct neck model:
 - » Thyroid Gland
 - » Trachea
 - » Esophagus
 - » Sternum
 - » Collarbone
 - » Carotid Artery
 - » Jugular Vein
2. Realistic neck ultrasound images
3. Usable with real ultrasound diagnostic devices
4. Allows the confirmation of the proper Nasogastric Tube Placement with ultrasound
5. Inner switch for tube insertion direction: trachea/esophagus for tube location image recognition tests (recognition by ultrasound of proper esophagus insertion or wrong tracheal insertion)



Training skills / Applications

- Proper handling and manipulation of probe on neck ultrasound
- Feeding tube insertion
- Confirmation of tube placement by ultrasound
- Neck scan to evaluate the tube position.

Set includes

- Main Body
- Ultrasound neck block
- Nasogastric Tube
- Syringe
- Talcum powder
- Storage case

Size (approx.)

- W29 x D18 x H17cm(Body)
- W17 x D10 x H10cm(cube)
- W11.4 x H6.7 x D7.1inch

Weight (approx.)

1.8kg(body) / 1.1kg(cube)



Ultrasound Guided Tube Feeding Phantom

KK1-US-20

DVT (Deep Vein Thrombosis) Phantom

For ultrasound screening of DVT (Deep Vein Thrombosis)

Features

1. Faithfull reproduction of blood vessel meandering, branching, and thrombus.
2. The built-in blood vessels allows for milking method as well as observation of compression of the vessels by applying pressure with a transducer.
3. Familiarize with assessment of venous thrombosis in the lower limbs.

Training skills / Applications

- Screening for deep venous thrombosis in the lower limbs
- Observation of blood flow by milking method

Set includes

- 1 lower limb manikin
- 1 ultrasound calf phantom (incorporated)
- 1 storage case
- 1 instruction manual

Size (approx.)

- W27 x D17 x H47 cm

Weight (approx.)

- 3.0kg



DVT (Deep Vein Thrombosis) Phantom

KK1-US-21

Lung Ultrasound Training Phantom (ECHOLUNG)

With advancements in medical imaging and the growing demand for accessible diagnostic tools, lung ultrasound has become an essential solution for assessing respiratory conditions. Kyoto Kagaku has developed a phantom specifically designed to help medical professionals practice the basics of this procedure, supporting skill development in a safe and effective manner.

Features

- Four kinds of units: A-LINE, B-LINE(few), B-LINE(many), pneumonia and pleural effusion for training in the basics of lung ultrasound.
- Anatomy includes: lung, chest wall, ribs
- No special storage needed
- Suitable for training in large groups
- High durability

Case / Pathology

- A-LINE
- B-LINE(few/many)
- Pneumonia and pleural effusion

Set includes

- Main Body
- Four kinds of lung modules
- Instruction manual
- Talcum powder
- Storage case



Size (approx.)

- **Body:** 32 x 25 x 12.5cm/13 x 10 x 4.9 inch
- **Module:** 14.8 x 11.8 x 11cm/5.8 x 4.6 x 4.3 inch

Weight (approx.)

Body: 1.9kg/ A-LINE/B-LINE/B-LINE (many): 0.9kg /Pneumonia and pleural effusion : 1.4kg

Lung Ultrasound Training Phantom ECHOLUNG

KK1-US-19

Pediatric FAST/Acute Abdomen Phantom

Ultrasound training for pediatric FAST procedures

Features

- Thoracoabdominal organs, bone structure and free-fluid for practicing FAST examination procedures. /
- Commonly seen pathologies in pediatrics. / 3. Acquire fundamental pediatric abdominal ultrasound skills, as well as FAST/Acute sonography skills.

Training skills / Applications

- FAST procedures: Internal hemorrhage at perihepatic, perisplenic, pelvis, and pericardium area / Sonography for acute pediatric patient: Bowel intussusception, appendicitis and biliary dilatation

Set includes

- 1 ultrasound phantom
- 1 talcum powder
- 1 storage case
- 1 tutorial manual (DVD)
- 1 instructon manual

Size (approx.)

- W41 x D17 x H15cm/W16.1 x D6.7 x H5.9in

Weight (approx.)

7kg / 15.4lb



Pediatric FAST/Acute Abdomen Phantom

KK1-US-8

FAST/Acute Abdomen Phantom “FAST/ER FAN”

Features

- An innovative phantom for repetitive training of FAST as an adjunct to the ATLS primary survey/
- Pathologies include cholecystitis, an aortic aneurysm and a lesion on the colon.

Training skills / Applications

- Internal hemorrhage at perihepatic, perisplenic, pelvis and pericardium area/ Sonography for acute patients

Case / Pathology

- FAST/ Cardiac Tamponade, Right Upper Abdominal Bleeding, Perisplenic Hemorrhage, emorrhage at Rectovesical Area/
- Acute abdomen/Inflammation of the Gallbladder, Aneurysm, Appendicitis, Diverticulitis

Set Includes

- 1 ultrasound phantom with carrying base/ 1 tutorial manual (DVD)

Size (approx.)

W62 x D30 x H24 cm (W24.4 x D11.8 x H9.4 in)

Packing size (approx.)

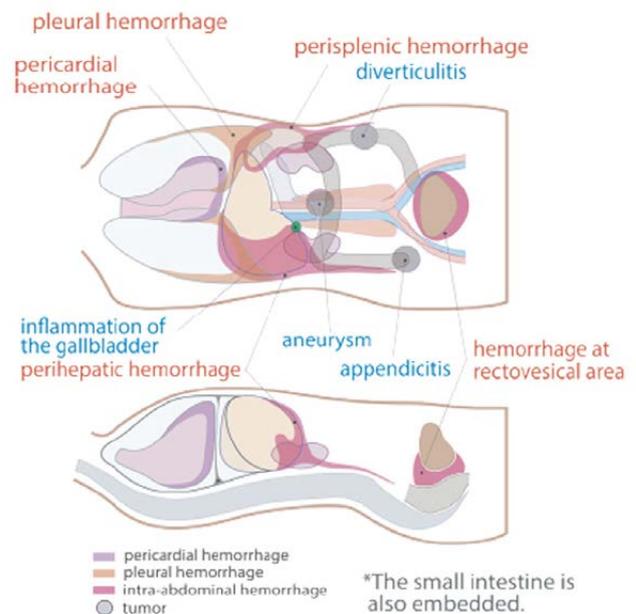
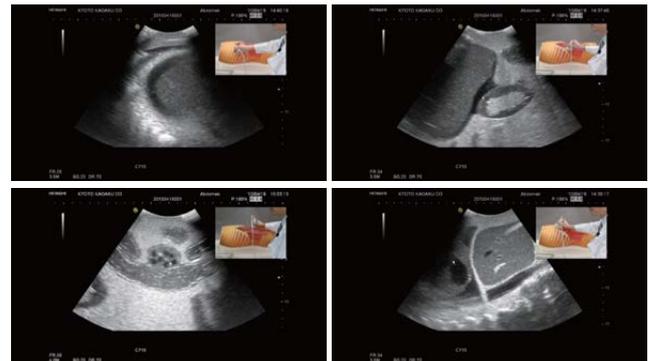
W81x D47x H35cm/W32x D18.5x H14in

Weight (approx.)

30kg / 66lb

Pediatric FAST/Acute Abdomen Phantom

KK1-US-5



Rectal and Bladder Ultrasound Phantom

Ultrasound training cubes for assessment of residual urine and excretion

Features

- Variation of residue excretion in the rectum for ultrasound assessment: hard, soft, combination and empty
- Three types of urinal bladder for assessment and urine volume measurement: small, middle, large with a balloon catheter

Training skills / Applications

- Ultrasound assessment of residue excretion in the rectum
- Measurement of urine volume
- Ultrasound assessment of the urinal bladder and the prostate
- Assessment of indwelling bladder catheter

Set includes

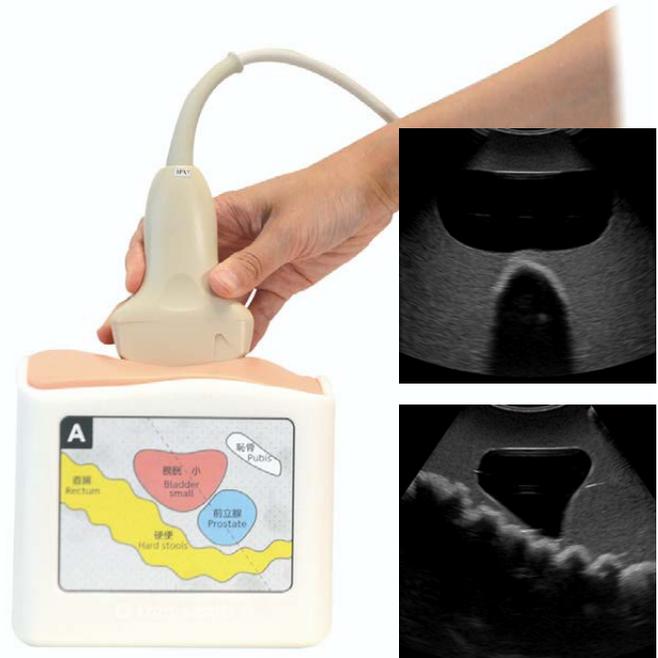
- 3 types of ultrasound phantom cube
- 1 talcum powder
- 1 storage case
- 1 instruction manual

Size (approx.)

- W15 x D15 x H20 cm

Weight (approx.)

- 2.0 kg (each)



Rectal and Bladder Ultrasound Phantom

KK1-US-23

Elementary Cubic Phantom BLACKCUBE

Acquire skills to envision three-dimensional shapes from two-dimensional sections (echo images). For the first step hands-on learning of ultrasound scanning.

Features

- Each cube contains a geometrical three dimensional object, which is externally invisible.
- All six surfaces of the cube allow for scanning.
- Facilitates learning basics in grasping three-dimensional shapes with a ultrasound scanner.
- Combinations of different cubes allow for skills assessment as well as practical trainings.

Training skills / Applications

- Visualization and measurement of geographical objects with a ultrasound scanner.
- Infer three dimensional shape based of 2-D ultrasound images from sic surfaces.

Set includes

- cube phantoms (6 for basic set, 8 for full set)
- 1 talcum powder
- 1 storage case
- 1 work book
- 1 instruction manual

Size (approx.)

- W10 x D10 x H10 cm
- W3.9 x D3.9 x H3.9 cm

Weight (approx.)

- 1.0 kg each



Elementary Cubic Phantom BLACKCUBE

KK1-US-24

Fundamental Ultrasound Phantom

This oval phantom helps sonographers with basic trainings

Features

- Phantom for basic manipulation of ultrasound transducer
- Recognition of shape, echogenicity, distance, and practice of horizontal transducer works, which are all you are able to learn through this oval phantom

Training skills / Applications

Interpret 2-D cross sectional images into the shape of 3-D dimensional objects / 10 objects are embedded/ Adjusting Time-Gain Compensation to obtain suitable density / Measuring dimensions and distance / Transducer handling to obtain accurate 2-D cross-section image / Flat and spheroidal surfaces provide a variety of difficulty.



Size (approx.)

W24 x D16 x H11 cm (W9.5 x D6.3 x H4.3 in)

Weight (approx.)

2.3kg / 5lb

Rectal and Bladder Ultrasound Phantom

KK1-US-18

About Erler Zimmer

Commitment to Quality and Realism

Erler Zimmer sets itself apart in the industry with an unwavering commitment to realism and quality. One of the standout features of Erler Zimmer's offerings is the use of real bone in many of their phantoms. This unique approach ensures that their models provide an exceptional level of detail and accuracy, essential for effective learning and training.

Medical Imaging Phantoms

Erler Zimmer provides an extensive range of advanced medical imaging phantoms, designed to simulate realistic conditions for various imaging modalities:

X-ray Phantoms

These phantoms are crafted with precision to provide accurate representations of human anatomy in X-ray imaging, incorporating real bone for enhanced realism.

CT Phantoms

High-quality phantoms that simulate human tissues and structures, aiding in the training and calibration of CT imaging systems.

MRI Phantoms

Advanced phantoms designed to replicate the properties of human tissues in MRI scans, ensuring accurate and reliable imaging results.



Full Body X-Ray Phantom

This model is unique in the world and provides excellent training opportunities for positioning and alignment techniques in projection radiography. It should be part of the basic equipment of any radiographic school. The phantom contains a real human skeleton as well as outlines of larynx, lung, heart and kidneys (organs will create a shadow on the image), which allows taking real X-ray images like in a patient.

Using a real skeleton provides even smallest guiding structures which is impossible with a plastic skeleton. During assembly of this phantom we pay special attention to the correct size of joint spaces. All joints are moveably mounted allow positioning in all normal x-ray positions (e.g. frog position, pro- and supination of lower arm). The arms can be moved upwards which makes the phantom suitable for use in all kinds of osseous examinations under CT. Each phantom is hand-made one of a kind; it may differ in size and appearance. Depending on the individual phantom it may have some pathologies, outer shape may differ depending on size of the skeleton. The new version was re-designed in co-operation with a well-known German school for radiographers and fits all needs for education in radiography.

This phantom is only sold against proof of medical use. Life size.



Radiographic positioning doll, plastic skeleton

This model offers all features of model 7200 but includes a plastic skeleton and is due to this only suitable for positioning training. Including a transport and storage case.



All Erler-Zimmer phantoms including transport cases





X-Ray thorax

Thorax X-ray phantom, consisting of spine (C6 to L3), thoracic cage, shoulder blades and collar bones, embedded in soft materials.

Mounted without metal parts. Organs (lung, heart, kidneys) are present as outlines to create a shadow on the x-ray image. The natural bones used may have, depending on availability, individual pathological changes, minor structural defects or mounting holes.

X-Ray thorax

ERZ-7400



X-Ray Phantom Pelvis, flexible

This flexible X-Ray phantom Pelvis contains real human bones and offers the unique opportunity to take real xray images. This Phantom consist of a complete pelvis including coccyx, two lumbar vertebrae (L4+L5) and femur stumps. The soft material makes this product ideal for palpation. The natural bone used may have, depending on availability, individual pathological changes, minor structural defects or mounting holes. Delivered with strong transport case.

X-Ray Phantom Pelvis, flexible

ERZ-7410



X-ray phantom head

Human skull, safely embedded in plastic for easy use. The jaws are slightly open to allow dental panoramic images of the teeth. The neck includes some cervical vertebrae depending on the ordered type. An embedded tread allows the use with a tripod. The jaw may have dental gaps, dental repairs, broken teeth, replaced teeth or other individual features. For detailed information about the available phantoms please contact our sales team.

X-ray phantom head with cervical vertebrae, transparent ERZ-7300

X-ray phantom head with cervical vertebrae, opaque ERZ-7310

X-ray phantom head, transparent ERZ-7320

X-ray phantom head, opaque ERZ-7330



Tripod for X-Ray Phantom head

Very strong tripod for use with the x-ray phantom head. Foldable but stable, holding the head safely in place. With rotatable head for precise positioning of the phantom in the x-ray machine.

Tripod for X-Ray Phantom head

ERZ-7350

X-ray Part Phantoms

Our X-Ray part phantoms give the unique opportunity to take x-ray images of single body parts again and again. The Phantoms include real human bones and allow to take real x-ray images. The models are perfect for schools and education, but also for medical technicians since the same bones can be x-rayed again and again in different settings without the danger of harming a patient.

The bones are embedded in transparent plastic. If requested the phantoms can be coated with opaque color to hide the inner structures. All phantoms are handmade and unique. They may differ in size and shape. Due to production technology there may be discoloring and cracks inside the phantom. This is related to production and is no lack of quality. These phantoms are only sold against a proof of medical use.



X-ray Phantom hand

Hand with wrist.

Transparent	ERZ-7210
Opaque	ERZ-7215

X-ray Phantom foot

Foot Skeleton with start of lower leg.

Transparent	ERZ-7230
Opaque	ERZ-7235



X-ray Phantom knee

Part of upper- and lower leg and patella.

Transparent	ERZ-7250
Opaque	ERZ-7255

X-ray Phantom lower arm

Hand with forearm and elbow.

Transparent	ERZ-7220
Opaque	ERZ-7225



X-ray Phantom elbow

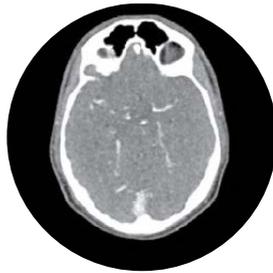
Part of upper and lower arm.

Transparent	ERZ-7260
Opaque	ERZ-7265

X-ray Phantom shoulder

Humerus with shoulder girdle.

Transparent	ERZ-7340
Opaque	ERZ-7345



Head CTA-Phantom

The phantom provides a highly realistic simulation of a head and neck CT angiography (with arterial contrast medium enhancement) of a patient with an arteriovenous malformation on the right side. The phantom comes at the original patient size and includes the cervical spine until the baseplate of the fifth cervical vertebra.

Head CTA-Phantom ERZ-NLP1000



Hand-Phantom

The hand phantom provides an extremely realistic simulation of a hand. Pathologies (e.g. fractures, calcifications, bones and soft tissue tumors) can be integrated on request.

Hand-Phantom ERZ-NLP1300



Abdomen-Phantom

The phantom provides a highly realistic simulation of a contrast medium enhanced abdomen (late arterial phase) of a patient. The phantom covers the abdomen from the tenth thoracic to the fourth lumbar vertebra. The liver and both kidneys are fully included.

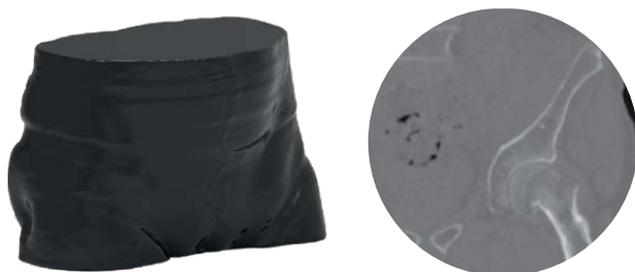
Abdomen-Phantom ERZ-NLP1100



Child Abdomen Phantom with a Vertebral Fracture

The phantom provides a highly realistic simulation of a contrast medium enhanced abdomen (portal venous phase) of a child with a vertebra plana (first lumbar vertebra). The phantom covers the abdomen from the tenth thoracic to the baseplate of the fourth lumbar vertebra. The liver and both kidneys are fully included.

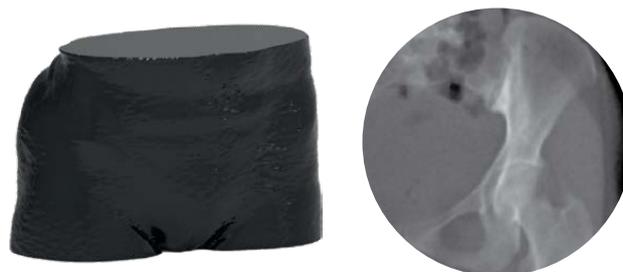
Child Abdomen Phantom with a Vertebral Fracture ERZ-NLP1110



Pelvis Phantom with Femoral Neck Fracture

The phantom provides a realistic simulation of a male pelvis without contrast medium enhancement and with a slightly dislocated femoral neck fracture on the left side. The phantom includes the entire pelvis and the fifth lumbar vertebra.

Pelvis Phantom with Femoral Neck Fracture ERZ-NLP1200



Pelvis Phantom with Coxarthrosis

The phantom provides a realistic simulation of a female pelvis without contrast medium enhancement and with advanced hip osteoarthritis on the right side. The phantom includes the entire pelvis and the fifth lumbar vertebra.

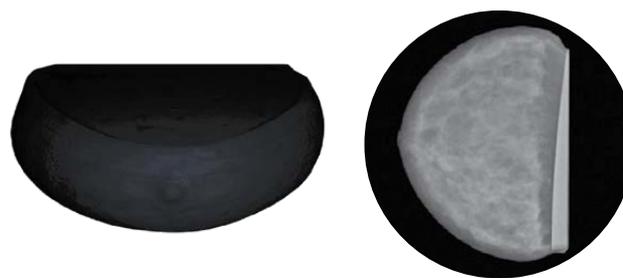
Pelvis Phantom with Coxarthrosis ERZ-NLP1210



Foot-Phantom

The foot phantom provides an extremely realistic simulation of a foot. Pathologies (e.g. fractures, calcifications, bones and soft tissue tumors) can be integrated on request.

Foot-Phantom ERZ-NLP1310



Breast Phantom for Mammography and Breast Tomosynthesis

Breast phantom with adipose and glandular tissue. This breast phantom was designed to simulate breast imaging in mammography and breast tomosynthesis. It represents a compressed breast of 4 cm thickness that can be placed under the compression paddle. This phantom provides a realistic simulation of breast imaging. It was developed for testing and optimizing dose and image quality and for training of medical and technical staff. The phantom is manufactured from virtual data containing adipose and glandular tissue. The models are handmade unique piece, which can differ slightly in size and design. The phantom can be provided as one-piece anthropomorphic phantom or in a sectional design. Dosimeter openings and pathologic features can be included upon request.

Breast Phantom for Mammography and Breast Tomosynthesis ERZ-NLP1400

About RSD Phantoms

Pioneering Innovation and Versatility

RSD Phantoms is renowned for its pioneering innovation and versatility in the field of medical imaging phantoms. With a strong focus on research and development, RSD Phantoms continually pushes the boundaries of what's possible in medical training and diagnostic imaging.

Comprehensive Phantom Range

RSD Phantoms offers a diverse range of phantoms designed to meet the exacting needs of modern medical imaging:

Radiotherapy Phantoms

RSD is a leader in the development of radiotherapy phantoms, providing highly accurate models that simulate human tissues and organs. These phantoms are essential for the precise calibration of radiotherapy equipment and techniques.

Diagnostic Imaging Phantoms

Their diagnostic imaging phantoms are meticulously crafted to replicate the intricate details of human anatomy. These models are vital tools for training, system evaluation, and quality assurance in various imaging modalities.

Customisable Solutions

One of the unique strengths of RSD Phantoms is their ability to create customizable solutions tailored to specific clinical and research needs. This flexibility ensures that healthcare providers and researchers have the exact tools they need to advance medical science and patient care.

Commitment to Quality

RSD Phantoms is committed to maintaining the highest standards of quality in their products. Each phantom undergoes rigorous testing and quality control processes to ensure it meets the demands of the medical community.

RSD RADIOLOGY SUPPORT DEVICES
ALDERSON | PHANTOMS



Wounded Willy & Damaged Debbie



Teaching & Training Phantoms For Military & Civilian Field Hospitals & Emergency Rooms

The concept of grouping a large number of casualties in two teaching/training phantoms was originated by the Fleet Hospital & Operations Training Center in Camp Pendleton, California. Wounded Willy & Damaged Debbie were designed and constructed by RSD.

These phantoms yield radiographs resembling those of a human body with human technical factors and limited artifacts, articulated to enable basic views to be presented, and with an appropriate level of human anatomy. They are well-balanced patient substitutes for basic training of radiologic technologists, particularly in military or emergency room environments.

At 5' 1" (156 cm) tall, weighing 105 lb. (48 kg), Willy & Debbie match the size and weight of RSD's Take-Apart Pixy. Technologists must learn to work with patients of all sizes and weights, so a smaller adult-size phantom is as valid for training as a larger phantom, and position is facilitated.

Both Willy & Debbie demonstrate and evaluate positioning and imaging techniques, including kVp, mAs, contrast, optical density, OFD and TFD. Their radiographs are optically equivalent to humans in density and contrast.

Pathologies and Traumas

- 59 pathologies and traumas available between Willy & Debbie
- Unlimited repetition of views without human exposure
- Radiographs that permit evaluation of trainee performance

Dimensions

206W x 81D x 64H cm / 120 kg
81W x 32D x 25H in / 265 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Willy & Debbie, Opaque, Take-Apart	RS-600TA
Willy, Opaque, Take-Apart	RS-601TA
Debbie, Opaque, Take-Apart	RS-602TA
Willy & Debbie, Transparent, Take-Apart	RS-600TTA
Willy, Transparent, Take-Apart	RS-601TTA
Debbie, Transparent, Take-Apart	RS-602TTA

Modalities

- CT
- X-Ray
- Fluoroscopy

Applications

- Field trauma & ER evaluation
- of technologist performance
- Teaching & training
- of patient positioning
- Image quality
- Diagnostic radiology
- Dosimetry verification
- Protocol verification

Anatomy

- Shoulders have ball and socket joints
- Elbows and knees flex 90° to 100°
- Broad range of positioning capabilities, including the "frog position"
- Debbie features fractures of the left shoulder and left hip plus arm and leg traumas on the right side
- Willy features traumas of both arms and legs

Take-Apart Pixy

Ideal Substitute for Teaching & Training Radiological Technologists

Offered in opaque or transparent, Take-Apart Pixy is an anatomically and radiologically correct female designed specifically for training radiologic technologists. At 5' 1" (156 cm) weighing 105 lb. (48 kg), Take-Apart Pixy is a repeatable, convenient substitute for patients and virtually indestructible.

Take-Apart Pixy may be ordered with or without abdominal and pelvic organs: stomach, gall bladder, urinary bladder, kidneys, rectum, and sigmoid flexure. The organs are air-filled but accept water or contrast media that can be easily flushed after use. Custom pathologies and traumas available at an additional cost.

Built with soft-tissue mold and skeleton molds that are matched for anatomic fidelity, Take-Apart Pixy permits unlimited exposures, demonstrates the effects of changing technical factors, and allows for evaluation of student performance. Students have no difficulty in maneuvering Take-Apart Pixy into most desired positions as the phantom is built to tolerate trainee errors.

Take-Apart Pixy is used to demonstrate anatomy and evaluate positioning and imaging techniques, including kVp, mAs, contrast, optical density, digital processing, OFD and TFD. Made of tissue-equivalent materials and life-like articulations, Take-Apart Pixy is more realistic than a cadaveric skeleton with radiographs that are optically equivalent in density and contrast to human patients.

C1, C2, C6, and C7 were converted to mechanical nylon joints because educators in the field prefer full positioning capabilities for the head. This design permits the remaining neck vertebrae to be fixed in a normal position, while assuring a full range of head motion.



- Anthropomorphic phantom disassembles into 9 parts
- Small size and low weight simplify positioning
- Unlimited repetition of most views for which patients cannot be used
- Provides valid feedback to evaluate trainee performance
- Designed to image any clinical view (AP, oblique, lateral, frog legs, etc.)
- Custom pathologies and traumas available



The skull of Take-Apart Pixy has frontal and sphenoidal sinuses, ethmoidal and mastoid air cells, and the auditory ossicles. Bone sutures are radiographically visible.

Soft tissues are available in opaque or transparent tissue-equivalent materials. The transparent Take-Apart Pixy has visible organs and skeleton.

Take-Apart Pixy lungs are molded of tissue-equivalent foam with the mass density of inflated human lungs (0.30 g/cc). They are connected to the oro-nasal cavity by the stem bronchi and trachea. The oro-nasal pharynx is filled with a nearly air-equivalent foam.

Modalities

- CT
- X-Ray
- Fluoroscopy

Applications

- Teaching & training
- of patient positioning
- Image quality
- Diagnostic radiology
- Dosimetry verification
- Protocol verification

Anatomy

- Shoulders have ball and socket joints
- Elbows and knees flex 90° to 100°
- A "frog position" is possible at the hips
- Right hand is molded with fingers positioned for an AP view
- Left hand is in an oblique-lateral position
- Feet are in natural position



Product Codes

Opaque with Fill Ports and Organs	RS-103
Transparent with Fill Ports and Organs	RS-103T
Opaque with Organs but NO Fill Ports	RS-104
Transparent with Organs but NO Fill Ports	RS-104T
Opaque with NO Fill Ports and NO Organs	RS-105
Transparent with NO Fill Ports and NO Organs	RS-105T

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Dimensions

152W x 69D x 84H cm / 111 kg
60W x 27D x 33H in / 245 lb.

Take-Apart CT Pixy

Take-Apart Pixy With Additional Organs And Circle Of Willis

In addition to the stomach, gall bladder, urinary bladder, kidneys, rectum, and sigmoid flexure, Take-Apart CT Pixy additionally includes lungs, heart, liver, ureters, large intestine, esophagus, Circle of Willis, and a storage case. Take-Apart CT Pixy may also be ordered with or without fill ports.

Opaque with Fill Ports and Organs	RS-103CT
Opaque with Organs but NO Fill Ports	RS-104CT



Domestic Violence Take-Apart Pixy

Anthropomorphic Training & Teaching Phantom with 16 Pathologies and Traumas Available

- Phantom disassembles into 9 parts
- Ideal substitute for teaching and training radiological technologists
- Small size and low weight simplify positioning
- Unlimited repetition of most views for which patients cannot be used
- Provides valid feedback to evaluate trainee performance
- Designed to image any clinical view (AP, oblique, lateral, frog legs, etc.)

Designed with the expert assistance of Judy McNitt-Mell, RSD's Domestic Violence Take-Apart Pixy is an anatomically and radiologically correct female designed specifically for training radiologic technologists. At 5' 1" (156 cm) weighing 105 lb. (48 kg), Domestic Violence Take-Apart Pixy is a repeatable, convenient substitute for patients and virtually indestructible.

Domestic Violence Take-Apart Pixy may be ordered with or without abdominal and pelvic organs: stomach, gall bladder, urinary bladder, kidneys, rectum, and sigmoid flexure. The organs are air-filled but accept water or contrast media that can be easily flushed after use. Custom pathologies and traumas available at an additional cost.

Built with soft-tissue mold and skeleton molds that are matched for anatomic fidelity, Domestic Violence Take-Apart Pixy permits unlimited exposures, demonstrates the effects of changing technical factors, and allows for evaluation of student performance. Students have no difficulty in maneuvering Domestic Violence Take-Apart Pixy into most desired positions as the phantom is built to tolerate trainee errors.

Pathologies and Traumas

Head	Displacement of mandibular condyle fracture Separate fracture of left frontal zygomatic bone Step deformity of left infraorbital rim Mandible fracture with missing bone Fracture of nasal bone
Neck	C4+C5 compression fracture
Body	Glenoid Fracture left scapular Fracture of lateral right ribs 6+7 Fracture of left ribs 8+9 mediolateral Right 12 rib fracture
Arm	Displaced fracture of left radius and ulna, midshaft Left hand 3rd and 4th metacarpals shattered Proximal tibia fracture with multiple bone fragment Right minimally displaced distal fibula fracture
Pelvis	Displaced pubic ramus fracture right and left
Foot	Right displaced angle fracture in calcaneus bone



Specifications:

152W x 69D x 84H cm / 111 kg
60W x 27D x 33H in / 245 lb.

Materials:

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Transparent with NO Fill Ports, includes storage case RS-106T

Body Section Phantoms

Specially Designed Teaching & Training Aid for Radiological Technologists

RSD's Body Section Phantoms provide a comprehensive evaluation of the imaging system and imaging techniques under realistic conditions. They are rugged, easily transported, and shatter-proof.

Available in opaque or transparent, RSD's Body Section Phantoms allow for tremendous flexibility with teaching and training. Each Body Section Phantom represents an average male 5 ft. 9 inc. tall (175 cm), with a weight of 162 lb. (74 kg).

Contact us for custom pathologies and traumas.

Elbow Phantom



Dimensions

25W x 25D x 25H cm / 2 kg
10W x 10D x 10H in / 5 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque, Ext.	RS-120
Transparent, Ext.	RS-120T
Opaque, 90° Flex.	RS-121
Transparent, 90° Flex.	RS-121T

Arm & Shoulder Phantom



Dimensions

91W x 30D x 41H cm / 11 kg
36W x 12D x 16H in / 25 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque	RS-122
Transparent	RS-122T

Foot and Ankle Phantom



Dimensions

25W x 25D x 25H cm / 1 kg
10W x 10D x 10H in / 3 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque, Ext.	RS-116
Transparent, Ext.	RS-116T
Opaque, Plantar	RS-117
Transparent, Plantar	RS-117T

Knee Phantom



Dimensions

30W x 30D x 30H cm / 5 kg
12W x 12D x 12H in / 10 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque, Ext.	RS-118
Transparent, Ext.	RS-118T
Opaque, 90° Flex.	RS-119
Transparent, 90° Flex.	RS-119T

Body Section Phantoms

Hand and Wrist Phantom



Dimensions

25W x 25D x 25H cm / 1 kg
10W x 10D x 10H in / 3 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque, Ext.	RS-114
Transparent, Ext.	RS-114T
Opaque, Flex.	RS-115
Transparent, Flex.	RS-115T

Leg and Hip Phantom



Dimensions

112W x 30D x 30H cm / 21 kg
44W x 12D x 12H in / 47 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque	RS-123
Transparent	RS-123T

Pelvis Phantom



Dimensions

51W x 51D x 51H cm / 25 kg
20W x 20D x 20H in / 55 lb.

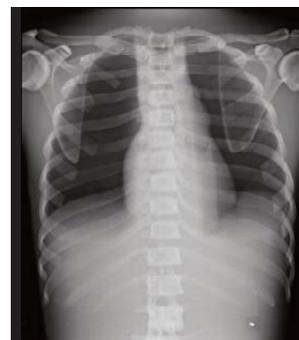
Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque	RS-113
Transparent	RS-133T

Thorax Phantom



Dimensions

112W x 30D x 30H cm / 21 kg
44W x 12D x 12H in / 47 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Product Codes

Opaque	RS-111
Transparent	RS-111T

Lung & Chest Phantom

Developed in conjunction with the University of California, Irvine's Department of Radiological Sciences, RSD's Lung & Chest Phantom is specialized at providing a high degree of realism in chest radiography.

RSD materials are equivalent to natural bone and soft tissues. Animal lungs are selected to match the size of an adult male. Lungs are fixed in the inflated state and are molded to conform to the pleural cavities of the phantom. The pulmonary arteries are injected with a blood equivalent plastic. The Lung & Chest Phantom with simulated left coronary artery reveals several areas of coronary artery irregularity and narrowing.

Dimensions

51W x 51D x 51H cm / 23 kg
20W x 20D x 20H in / 50 lb.

Materials:

- RSD Soft Tissue
- RSD Cortical Bone

Product Codes

Permanently sealed diaphragm	RS-310
Permanently sealed diaphragm and left coronary artery	RS-315
Removable diaph. lung pair insert no coronary artery	RS-320
Removable diaph. lung pair insert with coronary artery	RS-330



Mammography Phantom

Positioning Aid for Craniocaudal & Mediolateral Oblique Views

Demonstrates spot-compression procedures

- Sensitivity training for patient comfort
- Helpful in training male students (eliminating loaded vests to simulate breasts)

RSD's Mammography Phantom is a perfect patient substitute allowing instructors to teach mammography positioning. This valuable teaching and training aid simplifies classroom procedures, allowing trainees to take as many exposures as are needed to develop expertise. Mammograms, taken within the range of standard technical factors, provide realistic images with high contrast.

A molded gel provides realistic compressibility. Mammograms are taken at a breast thickness of 5-cm, using normal technical factors. The breast is mounted on a post with adjustments for height and the angles needed for various views.

A small indicator box is placed next to the breast to signal when the 5-cm breast thickness is reached. Patient discomfort is signaled by a red warning light which informs the trainee that the pain level can be reached at about this compression. The light is actuated 5-mm before the dead stop produced by the box. This procedure emphasizes the care needed for patients when the pain zone is reached.

Modalities

- Mammogram

Applications

- Teaching & training
- Image quality
- Protocol verification

Specifications:

Box 1: 51W x 41D x 36H cm
 Box 2: 74W x 74D x 15H cm
 Tube: 114L x 15D cm
 14 kg

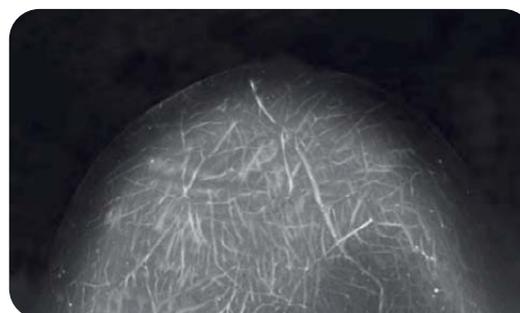
Box 1: 20W x 16D x 14H in
 Box 2: 29W x 29D x 6H in
 Tube: 45L x 4D in
 30 lb.

Product Codes

Stand & Case	RS-750
Phantom Only	RS-750A
Stand Only	RS-750S

Materials:

- RSD Soft Tissue



Head Phantom with Cervical Spine

Specially Designed Teaching & Training Aid for Radiological Technologists

Available in opaque or transparent, with or without cervical spine, RSD's Head Phantom allows for tremendous flexibility with teaching and training. Our Head Phantom represents an average male 5 ft. 9 in. tall (175 cm), with a weight of 162 lb. (74 kg). It is rugged, easily transported, and shatter-proof.

Applications

- Teaching & training
- Image quality
- Panographic Imaging
- Dosimetry verification
- Protocol verification

Modalities

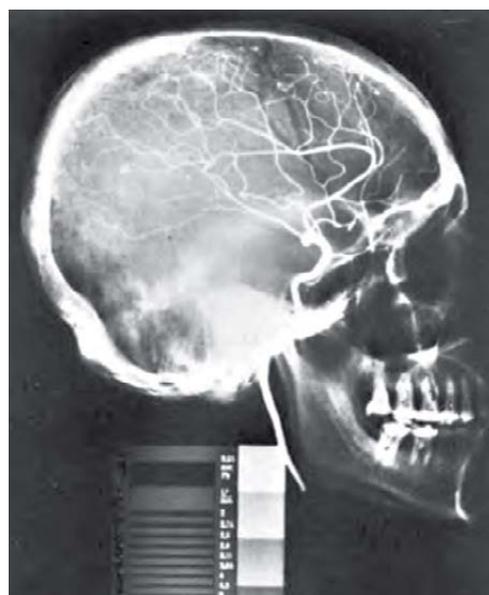
- CT
- X-Ray
- Fluoroscopy
- Dental X-Ray
- CBCT

Anatomy

- Skull and spine composed of Cortical (TS-1003) and trabecular bone (TS-1002) equivalent materials
- Brain material composed of RSD ART soft tissue material (TS-1001-T)
- Spinal cord material made of ART soft tissue material with density of 1.1 g/cc
- Oral, trachea, and sinus cavities filled with Styrofoam

Product Codes

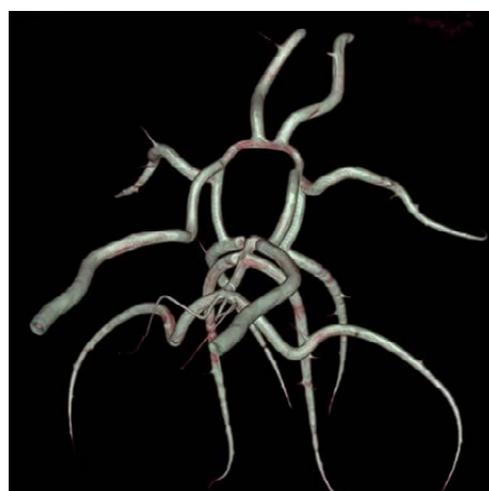
Opaque, Head Phantom with Cervical Spine	RS-108
Transparent, Head Phantom with Cervical Spine	RS-108T
Opaque, Head Phantom ONLY	RS-109
Transparent, Head Phantom ONLY	RS-109T



Circle of Willis

High Anatomical Detail in the Sub-Millimeter Range

The 3-D printed Circle of Willis provides a much cleaner and robust solution for end users. Using a novel resin, RSD is able to simulate contrast-infused vasculature thereby eliminating the need to inject messy contrast through tubing that has to be constantly replaced. May be added to any new order with head phantom for an additional fee.



RSD Injection Phantom

Teaching & Training Aid for Proper Needle Placement & Skill Maintenance

- Instrumental for teaching, training, and maintaining skills
- Review of fluoroscopy system
- Eliminates biohazards associated with cadavers

RSD Injection Phantom helps one learn and hone skills for proper needle placement for a variety of interventional techniques. Fluoroscopic needle placement can be taught or practiced realistically without fear of biological contamination hazards associated with fresh or frozen cadavers.

Fluoroscopically, the look and feel of the anatomical landmarks is important and can be demonstrated with the use of RSD Injection Phantom. Needle placement for caudals, epidurals, selective nerve and root blocks, medial branch blocks, facet injections and sympathetic blocks can all be demonstrated. Practice RF needle-placement along with disc needle- placement plus injection techniques for shoulder, hip, and symphysis pubis—all in the convenience and safety of your own laboratory or teaching facility. There is now no need to deal with local, state, and federal regulations regarding biohazards associated with cadavers.

RSD Injection Phantom has the capability for injections not only in the spine, but also at one shoulder, one hip, and at the pubis symphysis.

The skeletal structures of RSD Injection Phantom are covered with a soft gel and a latex skin, supported by a hard, synthetic material.

Further simplifications are the elimination of skeletal articulations that permit joint or spinal motions and the elimination of rib numbers 2 to 9; the rigid flesh makes these superfluous. Positioning of the RSD Injection Phantom as a single unit provides complete and realistic positioning capabilities.

The gel-filled injectable parts of the RSD Injection Phantom are completely encased in a latex skin. Allergic reactions are not expected to be a concern for the vast majority of users. The materials and design processes in RSD Injection Phantom are made not only to simplify the overall process but also to keep it as realistic as possible.

RSD Injection Phantom has been tested to determine the probable effective life of injection sites; a gel/skin section was used for a trial and six hundred injections were made in a dime-sized area. There was no perceptible degradation of the latex skin or of the gel itself. Considering the far greater area available in the RSD Injection Phantom, it is unlikely that repairs or refurbishments will be needed for a very long time.



Modalities

- X-Ray
- Fluoroscopy

Applications

- Practice needle placement for pain management techniques
- Protocol verification

Dimensions

122W x 41D x 51H cm / 73 kg
48W x 16D x 20H in / 160 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

RSD Injection Phantom

RS-1300

ART Phantom - Alderson Radiation Therapy

Accurate Organ Dosimetry Measurements With Minimal Dosimeters

- Over 10,000 phantoms in use all over the world for 30 years
- Indispensable quality-assurance tool
- Molded of tissue-equivalent material

Molded of tissue-equivalent material and intended for accuracy and ease of use, the Alderson Radiation Therapy (ART) Phantom is a refined and improved version of the Alderson RANDO Phantom. ART Phantoms are designed within highly sophisticated technological constraints and follow ICRU-44 standards. Additionally, the phantoms provide integrated tests of the entire chain of treatment planning and delivery.

The ART Phantom is transected-horizontally into 2.5 cm thick slices. Each slice has holes which are plugged with bone-equivalent, soft-tissue-equivalent or lung tissue equivalent pins which can be replaced by TLD holder pins. Holder pins may be ordered separately.

Soft-tissue-equivalent coatings produce slices with glass smooth interfaces. These coatings are cut away over the air spaces of the oronasal pharynxes, trachea, and stem bronchi. Dosimetry holes are drilled in grids 3 cm x 3 cm or 1.5 cm x 1.5 cm in 5 and 7 mm diameters thereby allowing for detailed measurements of dose distributions.

Breast Attachments

Breasts are available in various sizes. They can be sliced in frontal planes, drilled or undrilled for film dosimetry. Slices can receive any of the pins listed in the TLD Dosimeters and Fittings section, below. Breasts of male and female ART Phantoms are contoured to blend realistically with the thoraxes and attached with nylon screws. The male chest with attached breasts serves as a large female.

Lungs

Lungs are molded from syntactic foam, with a specific gravity of 0.30 g/cc.

TLD Dosimeters and Fittings

Phantoms are shipped with all dosimetry holes filled with blank pins. Pins for TLD chips have recesses at one end measuring 3.2 x 3.2 x 0.9 mm. Pins for TLD rods have 1 mm-diameter holes cross-drilled at the centers of the pins. All pins are 2.50 cm long unless otherwise specified. Pins may also be ordered to accommodate various types of OSLD dosimeters. Tissue equivalent plugs specifically machined for TLD chips, TLD rods, TLD bars, TLD cubes, MOSFET detectors, as well as LANDAUER® OSL MicroSTAR® and nanoDot® holders, are also available.



Anatomy

- The male ART represents a 175cm (5 ft. 9 in.) tall, 73.5kg (162 lb.) male
- The female ART represents a 155 cm (5 ft. 1 in.) tall, 50 kg (110 lb.) female

Modalities

- External beams in the 0.04 to 40 MeV
- Fluoroscopy/Intensity-Modulated Radiation Therapy (IMRT)
- Stereotactic Body Radiation Therapy (SBRT)
- Gamma Knife
- CyberKnife
- CT
- Cone Beam CT

Applications

- Organ specific dosimetry for all dosimeters (TLD, OSL nanodots, MOSFET, film, ion chambers, and diodes)
- Standard 3cm x 3cm or 1.5cm x 1.5cm hole grids for dosimeters
- IMRT organ dose distributions

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Dimensions

122W x 41D x 51H cm / 73 kg
48W x 16D x 20H in / 160 lb.

Assembly

ART Phantom slices are held between aluminum plates by nylon tie rods. Knobs at the end of the rods clamp the slices tightly in proper alignment. Both internal and external assembly devices are included. The external assembly facilitates film dosimetry, while the internal assembly is used generally with TLDs or ion chamber

Grid Hole Spacing	Undrilled	3cm x 3cm	1.5cm x 1.5cm
Male ART Phantom (Sections 0-35)	ART-200X	ART-200	ART-200A
Male ART Head & Neck Phantom (Sections 0-9)	ART-210X	ART-210	ART-210A
Male ART Chest Phantom (Section 10-25)	ART-211X	ART-211	ART-211A
Male ART Pelvis Phantom (Sections 26-35)	ART-212X	ART-212	ART-212A
Female ART Phantom (Sections 0-32)	ART-300X	ART-300	ART-300A
Female ART Head & Neck Phantom (Sections 0-9)	ART-310X	ART-310	ART-310A
Female ART Chest Phantom (Sections 10-23)	ART-311X	ART-311	ART-311A
Female ART Pelvis Phantom (Sections 24-32)	ART-312X	ART-312	ART-312A

Spherical Phantom

Dependable Aid For Demonstrating Degree of Accuracy and System Stability

RSD's Spherical Phantom is a reliable aid to check mechanical and domestic treatment parameters. Comes with truncated cone for TLD (or Film Dosimetry) and TLD Dosimetric Cylinder. Also includes two spare nylon assembly rods and two spare blind nylon nuts. Optional: Truncated Cone for Ion Chamber (including molding or machining to install Ion Chamber to User's specification at the center of the sphere) and Film Dosimetric Cylinder.

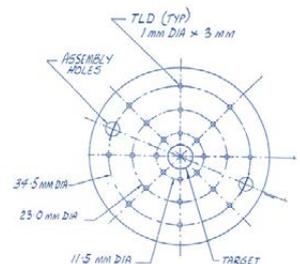
When the center of the sphere is used as the target for testing the treatment unit, it must indicate the relationship between the point of maximum dose and the target. These should closely coincide for an accurate system.

A three-dimensional dosimetry cylinder at the center of the sphere measures both the deviation of the maximum dose from the target and the gradient of the dose along the three orthogonal axes of the sphere. The TLD dosimetric cylinder is a stack of dry-water disks of 44 mm in diameter. Seven of the disks have concentric rings of holes for TLD rods, 1 mm in diameter and 3 mm long. Disk #4 is in the central plane of the cylinder. A smaller target disk is at the center of this disk. It has a Hounsfield number of about 130 for visibility in a CT scan. The disks are assembled tightly by two nylon rods and round, blind nuts, which locate the cylinder precisely, linearly and angularly, in both sphere and head.

The Film Dosimetric Cylinder: This is an optional cylinder, interchangeable with the TLD cylinder. It is built up of 11 film disks and 12 dry-water disks with the same nylon assembly rods and blind nuts. A simple fixture is supplied so the user can punch the film disks from film sheets.

Standard Cone: This is a dry-water cone, which fits precisely in a recess in the sphere. It accepts the dosimetric cylinder (TLD or film). It houses the dosimetric cylinder at the center of the sphere.

Optional Cone: This is molded to locate the measuring volume of an ion chamber at the center of the sphere. This cone is custom molded to suit the particular ion chamber specified by the customer.



Modalities

- Intensity-Modulated Radiation Therapy (IMRT)
- Stereotactic Body Radiation Therapy (SBRT)
- Gamma Knife
- CyberKnife
- CT
- Cone Beam CT

Applications

- Homogenous dry water phantom with precise spherical shape, 16 cm diameter
- Displacement of maximum dose from center of sphere shows degree of accuracy and stability of the system
- Checks the dose-calculation algorithm for a homogenous sphere

Dimensions

41W x 41D x 41H cm / 2 kg
16W x 16D x 16H in / 5 lb.

Materials

- RSD Soft Tissue

Spherical Phantom

RS-1100A

Head Phantom for Stereotactic Surgery

Total System Quality Assurance With Verification Of Treatment Accuracy

RSD's Head Phantom for Stereotactic Surgery serves to check accuracy of treatment for quality assurance. Comes with TLD Dosimetric Cylinder and one solid piece plus the Dry Water Cylinder to fill the other cavity. Also includes two spare nylon assembly rods and two spare blind nylon nuts. Optional: Truncated Cone for Ion Chamber (including molding or machining to install Ion Chamber to User's specification at the center of the sphere) and Film Dosimetric Cylinder.

Provisions are made for installation of the dosimetric cylinder at two locations in the cranium. One is on the CC axis of the head close to the apex. The other is near one side of the head at about ear level. Both cylinders are perpendicular to the transverse planes of the head. Since the dose at only one location is to be measured at a time, the other location is filled with a dry-water cylinder with no dosimetric provisions. The target can be located uniquely by an initial CT scan.

Modalities

- Intensity-Modulated Radiation Therapy (IMRT)
- Stereotactic Body Radiation Therapy (SBRT)
- Gamma Knife
- CyberKnife
- CT
- Cone Beam CT

Applications

- Total system quality assurance
- Checks the dose calculation algorithm with and without correction
- Measures the dose delivered to intracranial lesions

Dimensions

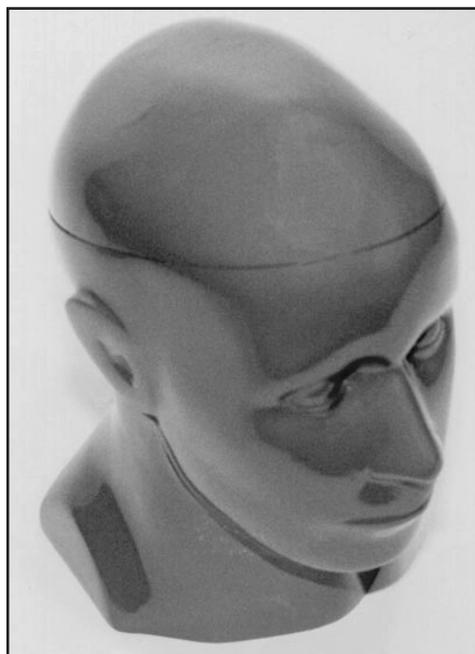
41W x 41D x 41H cm / 6 kg
16W x 16D x 16H in / 14 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Head Phantom for Stereotactic Surgery

ST-1150A





Dynamic Breathing Phantom

The Only Dynamic Anthropomorphic Thorax

- For use in diagnostic radiology, radiation therapy, and routine quality assurance
- Faithful simulation of physical form, imaging, and dosimetry properties
- Moving target to simulate tumor motion with the lung
- Based on the Alderson Radiation Therapy (ART) Phantom

RSD's newest edition of the Dynamic Breathing Phantom features simplified wiring, an improved control box, optional air supply, pre-designated profiles of patient specific breathing patterns, and the option to integrate simple heart and breast models with the phantom. Plus, the complete system is smaller, lighter, and quieter with revised software for Windows 10 providing a more intuitive interface.

Designed for use in diagnostic radiology settings for the acceptance of diagnostic CT-based scanners and radiation therapy machines, as well as the evaluation of patient radiation therapy delivery and dosimetry, RSD's Dynamic Breathing Phantom achieves realistic anterior ribcage motion by air inflation in realistic breathing patterns. The phantom itself is a simulation of an average adult humanoid torso including lungs, ribcage/ chest-wall bone, skin, and sub-dermis. The material properties of the incorporated soft tissue, organs, bones, and joints provide a faithful simulation of the physical thoracic form and of radiological imaging and radiation dosimetry properties.

This unique phantom has a moving target within the lung equivalent lobe to simulate tumor motion inside the lung. The electro-pneumatic motion controller and easy-to-use phantom control software allow users to program different breathing patterns and breathing rates so that they can choose their evaluations to precisely plan dose delivery to any patient. Target motion is controlled independently of the breath motion and may be set to be antithetical or to mimic the recorded motion of a radiation therapy targeted tumor.

The Dynamic Breathing Phantom System includes: The Dynamic Breathing Phantom (thoracic mannequin), electro-pneumatic motion controller, target fixtures for imaging and radiation dosimetry, individual thorax and target motions & rates: sin2, sin4, sin6, 1-sin4, 1-sin6, 5-20 breath/min, Phantom Control Software for Microsoft Windows, and USB control hardware.

Modalities

- Intensity-Modulated Radiation Therapy (IMRT)
- Stereotactic Body Radiation Therapy (SBRT)
- Surface Guided Radiation Therapy (SGRT)
- Image-Guided Radiation Therapy (IGRT)
- Biology-guided Radiotherapy (BgRT)
- Gamma Knife
- CyberKnife
- CT
- Megavoltage CT
- Cone Beam CT
- X-Ray

Applications

- Diagnostic CT 4D and linear-accelerator MVCT or CBCT surface motion gated image system acceptance
- Moving internal target tracking evaluation for QA of EBRT, SGRT, IGRT, and BgRT, as well as SPECT and PET imaging
- Optimization of diagnostic and radiation therapy breathing protocols
- Routine quality assurance

Dimensions

41W x 41D x 41H cm / 2 kg
16W x 16D x 16H in / 5 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Dynamic Breathing Phantom with Intergrated Control Module & Air Supply	RS-1500
Dynamic Breathing Phantom Control Module (using External Air Supply at 110~230V AC)	BF-1500CM
External Air Supply (available in 110~230V AC)	BF-1500AIR

Striatal Phantom

Image Quality Evaluation & Assurance With Quantification Of Striatal Uptake

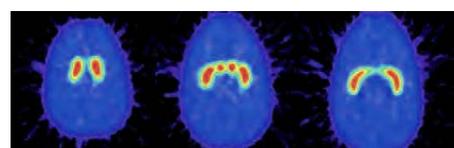
The Striatal Phantom optimizes quantitative imaging in patients, using PET or SPECT. This phantom is based upon a standard RSD head with a calvarial cut to insert or remove the brain shell easily. The nasal cavity and maxillary sinuses are filled with foam with a mass density of 0.23 g/cc.

The brain shell has five compartments which can be filled separately: left and right nucleus caudate, left and right putamen, and the remainder of the brain. This allows different nucleus caudate to putamen ratios as well as different striatal to background ratios to be obtained; this also permits differences between left and right striatal activity to be examined. The volume of the brain shell is about 1,260 ml. The volumes of the nucleus caudate and putamen are 5.4 ml and 6.0 ml respectively.

Fillable External Markers: A set of fillable capsules is provided to serve as external markers. Capsules can be filled with a radioactive solution and attached to the external surface of the phantom. The phantom can then be imaged, using SPECT or PET modalities to compare image-registration techniques.

Quantification of striatal uptake is not straightforward because it depends on a number of factors including type of radionuclide used (Tc-99m, I-123 or F-18), imaging factors (such as collimator type, amount of scatter and attenuation), and image processing parameters (such as scatter and attenuation-correction techniques, type of reconstruction filter, slice thickness, region-of-interest size and its location).

In normal subjects, the putamen and head of the nucleus caudate are small structures with typical dimensions of 7-15 mm in the axial plane (that is comparable to the system resolution). Since partial volume effects are more important for objects with dimensions less than twice the system resolution, the selection of imaging and reconstruction parameters is critically important in calculating the striatal-to-occipital ratio used to measure the relative striatal uptake in the brain.



Dimensions

36W x 36D x 36H cm / 5 kg
14W x 14D x 14H in / 12 lb.

Modalities

- SPECT/PET

Applications

- Image quality evaluation
- Image registration quality assurance
- Quantification of striatal uptake
- SUV calculation and validation

Head without Brain Shell	RS-900
Head with Transparent Brain Shell containing Striatum	RS-900T
Transparent Brain Shell with Striatum	RS-901T

Thyroid Phantom

Thyroid Uptake & Image Quality Assurance

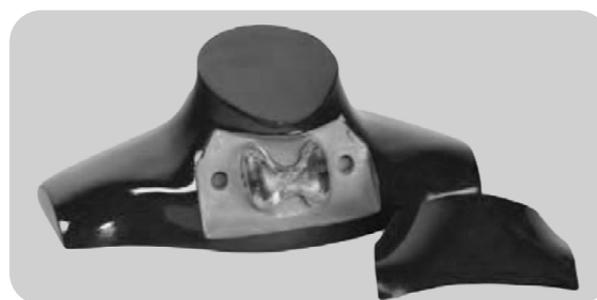
The Thyroid Phantom is an integral part of the Fission-Product Phantom, but it can also be supplied separately (with or without a head). This phantom has the same contours as in the full Fission-Product Phantom and contains a neck with corresponding "Superhuman Skeleton" vertebrae, a hollow-shell thyroid with filling and flushing ports, and a front cover of tissue-equivalent phantom material. This assembly has been designed for rapid removal of the cover plate and thyroid, a quick fill with an isotope solution and an equally rapid reassembly. This permits work with iodines of very short half-lives. A portion of the clavicles and sternum are included to further enhance the realism of the phantom.

Modalities

- SPECT/PET

Applications

- I-131 therapy training
- Thyroid uptake and scan quality assurance
- SUV quantification and validation



Dimensions

36W x 36D x 36H cm / 5 kg
14W x 14D x 14H in / 12 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Without Head	RS-542
With Head and Cervical Spine	RS-545

Heart & Thorax Phantom

Evaluation of Detectability, Extent, and Severity of Myocardial Infarcts In Patients

- Receptor Quantification as a Function of Uptake Ratio(s)
- Partial Volume Effects
- Scatter and Attenuation – Correction Schemes
- Threshold for Changes in Uptake(s)
- Comparison of Different Acquisition Modes, e.g. 2D vs. 3D Pet(s)

RSD's Heart & Thorax Phantom is designed to provide different reconstruction strategies, imaging protocol for patients, and testing and validation of image registration techniques. It also delivers a valid assessment of mammoscintigraphy techniques.

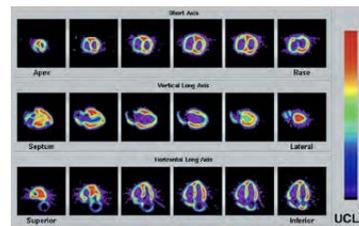
Heart: An accurately anatomic heart model is based on vacuum-formed shells. It was designed using high resolution, contrast-enhanced, ultrafast CT data from a normal patient, slightly modified to facilitate its use. The left and right chambers are connected at the atrium region to make a single compartment which can be filled and flushed independently using two ports labeled HC (heart chambers). The right ventricle is slightly modified to allow air to escape during filling. The myocardial wall (MW) has two ports, flushing and independent filling. The volume of the heart chambers is 284 ml, while the volume of the myocardial wall is 238 ml, without inserted defects. The standard model includes three defects with volumes of 8.9, 13.5, and 41.7 ml, respectively. Each of the defects can be filled separately. Defects of different dimensions can be ordered at no added cost. A disassembled heart is sent on request, so that dimensions of a special set can be established. Note that different defects cannot be retrofitted in the assembled heart.

Basic Thorax: The thorax is molded of polyurethane, modified for tissue equivalence, with a mass density of 1.10 g/cc. The narrow beam linear attenuation coefficient measured at 140 keV (Tc-99m) is 0.160 cm⁻¹. The volume of the thoracic cavity, when all organs (heart, lungs, and liver) are inserted, is about 8,200 ml. It is filled from the top, with either an inert or a radioactive solution, to simulate the thoracic background. A valve is installed at the base for conveniently draining the phantom. The residue on the walls of the cavity can be easily flushed with the fittings provided at the top of the phantom. A second, smaller fitting is also provided as an air-bleed during filling.

Lungs: Perfusable lungs are molded in hollow, vacuum-formed shells, filled with Styrofoam beads. The final mass density of 0.40 g/cc is attained by adding an inert or radioactive solution through a filling port at the top of each lung shell. Extra sets of lungs can also be furnished for work continuity. The volumes of the left and right lung shells are 907 ml and 1,134 ml, respectively.

Liver: A liver with a volume of 980 ml is included to evaluate the effect of its uptake on quantitative myocardial imaging. It is a vacuum formed shell, mounted on acrylic tubes to minimize artifacts. The liver can be filled with an inert or radioactive solution.

Fillable External Markers: A set of fillable capsules is provided to serve as external markers. Capsules can be filled with a radioactive solution and attached to the external surface of the phantom. The phantom can then be imaged, using SPECT or PET modalities to compare image registration techniques.



Thorax Overlay, Removable Breasts, and Breast Tumors: The thoracic phantom without the overlay simulates an average male patient. The overlay, with or without breasts, simulates a large female or a still larger male patient, respectively. It is then possible to evaluate the effect of additional attenuation and scatter on quantitative myocardial imaging. The volume of each vacuum-formed breast is 972 ml. A tumor, filled with a radioactive solution can be inserted to evaluate the planar and tomographic imaging techniques used for mammoscintigraphy. A set of breast tumors (3, 6, 9, 12 and 15mm diameters) is included. They are supported by thin, threaded nylon rods which pass through ports and are sealed by O-rings. They can be bent by hand to reach any part of a breast.

Modalities

- SPECT/PET

Applications

- Myocardial perfusion SPECT image quality evaluation
- Attenuation corrections
- Evaluating patient doses
- Training for SPECT/PET imaging
- Quantitative phantom for
- SUV validation

Dimensions

86W x 79D x 48H cm / 32 kg
34W x 31D x 19H in / 70 lb.

Materials

- RSD Soft Tissue
- RSD Cortical Bone
- RSD Trabecular Bone

Heart/Thorax Phantom	RS-800T
Thoracic Cavity with the bottom plate	RS-801
Perfusable Lungs with Styrofoam beads (pair)	RS-802
Heart with two hollow defects in myocardial wall – standard size or to fit	RS-804
Liver Shell ONLY	RS-805
Chest Overlay	RS-806
Removable Breast with set of tumors	RS-807

Heart & Thorax Phantom

Worldwide Reference Standard For In-Vivo Counting

The Lawrence Livermore Realistic Phantom was developed under the direction of the U.S Department of Energy, primarily as a reference standard for the in vivo counting of emissions from low-energy transuranic nuclides. The organs of interest are the lungs, liver and lymph nodes. Each of these may be radioactive or inert. These organs are accommodated in a male thorax generally similar to average adult males. This phantom contains a synthetic bone skeleton molded within a soft-tissue-equivalent material.

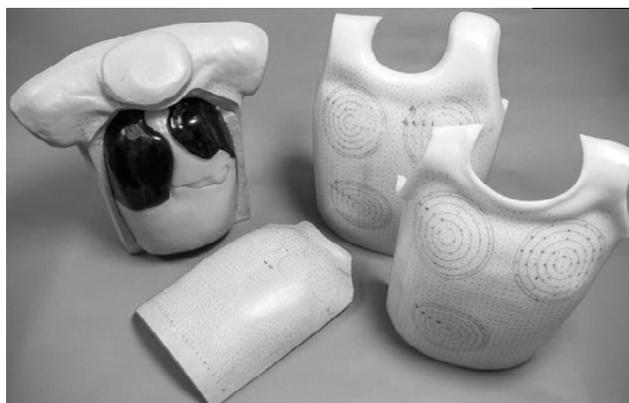
Organs: All organs are made of soft-tissue equivalent materials. Lungs are available with nuclides uniformly dispersed throughout the lung molding material. Optional organs (developed by RSD and not part of the original DOE specifications) are inert but have holes in 2cm² grids. These either can be filled with inert plugs or with active capsules to establish any desired distribution within the lungs.

The liver has the same loading flexibility with an additional option designed for use with solutions having relatively short half-lives. This liver is a hollow shell with a fill/drain port. If the liver is not required, it may be replaced with the Abdominal Contents, which are also available with a hole matrix, or active.

Chest Overlay Plates: Transuranic emissions from individuals with varying amounts of muscle and/or adipose tissue may be so attenuated as to be undetectable. Chest overlay plates were developed to ensure the validity of in vivo counting of such individuals. There are three sets of plates, each in four graded thicknesses. One set is equivalent to 87% adipose and 13% muscle, another is equivalent to 50% adipose and 50% muscle, and the third is equivalent to 100% muscle. Plates of each material and/or each thickness are available separately.

Targets: Three sets of concentric circles are drawn in permanent black ink over the torso cover and over each chest overlay plate. They range in 1 in. increments from 1 in. to 5 in. in diameter, with a 5.5 in. diameter outer circle. One set of circles is placed over each lung region, with the outer circle tangent to the inferior aspect of the clavicle and protruding over the sternum. The third set is placed over the liver. A 2cm² grid is projected in red ink over most of the chest surface by the same technique that is used for the circles. All targets are consistent among all phantoms.

Isotopes: RSD routinely manufactures active organs with isotopes to suit users' needs. Active capsules to fit into the gridded holes are available, or empty capsules can be supplied to be filled by the user. RSD usually supplies the required isotopes, but users may furnish them if so desired. Some isotopes are manufactured only at intervals throughout the year, so delivery is subject to availability. In some cases, calibration costs from governmental sources are subject to wide fluctuations. Isotopes are most often received as calibrated solutions, traceable to the NIST. Organ loading is controlled by micropipetting aliquots from the calibrated solutions. Uraniums and plutoniums are traceable to the NIST by mass. Other isotopes are usually traceable by activity.



Applications

- Calibration standard for the quantitation of in vivo radioactivity
- Detector calibration for photons deposited in human organs
- In vivo counting of emissions from various isotopes
- Organ bioassays for various isotopes

Dimensions

51W x 51D x 51H cm / 34 kg
20W x 20D x 20H in / 75 lb.

Lawrence Livermore Realistic Phantom

RS-500

Heart & Thorax Phantom

Made For Nuclear Power Stations With More Organs Than The Lawrence Livermore Realistic Phantom

The Fission-Product Phantom is partially modeled after the Lawrence Livermore Realistic Phantom. It was developed by RSD to meet the needs of nuclear power stations and other facilities that require more organs than provided by the Lawrence Livermore Realistic Phantom.

This phantom may be used on a couch, in a chair, or standing. It includes the head and neck, the complete torso, and stub legs articulated at the hips (which are also needed for the sitting position). The same access to the torso cavity is provided as in the Lawrence Livermore Realistic Phantom.

Fission-Product Phantom system includes head, neck, and neck cover plate for thyroid access; complete torso and gridded torso cover; inert heart, lungs, lymph nodes, thyroid, liver, kidneys, stomach, pancreas, spleen, small and large intestines; stub legs with pivot bolts; documentation; and permanent shipping and storage case.

The materials of construction are RSD multi-energetic formulations. The skeleton has been extended to include the head and full torso. The RSD "Superhuman Skeleton," which is multi-energetic, is used. RSD materials closely meet the standards of the International Commission on Radiation Units and Measurements (ICRU) Report No. 44 (Tissue Substitutes in Radiation Dosimetry and Measurement, 1989).

Organs: The organs of the Lawrence Livermore Realistic Phantom fit exactly into the Fission-Product Phantom, but RSD has modified the internal construction to accommodate additional organs: thyroid, kidneys, stomach, spleen, pancreas, and small and large intestines. The Fission-Product Phantom system is shipped with inert organs. Any or all organs can be replaced by radioactive organs, which are shipped in separate packages.

The same choices of nuclide loadings are available for active organs as for the liver of the Livermore Phantom (uniformly dispersed in the molding materials, hollow shells, or with hold grids). These are fitted specifically to the Fission-Product Phantom and are not interchangeable with the Livermore Phantom.



Isotopes: RSD routinely manufactures active organs with isotopes to suit users' needs. Active capsules to fit into the gridded holes are available, or empty capsules can be supplied to be filled by the user. RSD usually supplies the required isotopes, but users may furnish them if so desired. Some isotopes are manufactured only at intervals throughout the year, so delivery is subject to availability. In some cases, calibration costs from governmental sources are subject to wide fluctuations.

Isotopes are most often received as calibrated solutions, traceable to the NIST. Organ loading is controlled by micropipetting aliquots from the calibrated solutions. Uraniums and plutoniums are traceable to the NIST by mass. Other isotopes are usually traceable by activity.

Applications

- Calibration standard for the quantitation of in vivo radioactivity
- Detector calibration for photons deposited in human organs
- In vivo counting of emissions from various isotopes
- Organ bioassays for various isotopes

Dimensions

107W x 51D x 46H cm / 75 kg
42W x 20D x 18H in / 165 lb.

The Fission-Product Phantom

RS-550

RSD Materials

Soft Tissues: There are unlimited, small variations in density and absorption throughout the human body. Phantom soft tissue is closely controlled to have the average density of these tissues.

Skeletons: RSD skeletons are highly detailed polymer moldings which reproduce the shape, mass density and attenuation coefficients of cortical bone and spongiosa. RSD's proprietary moldings allow for continuous production, eliminate the restrictions of human skeleton bones (including limited availability, unethical collection of human bone specimen, variable size, and uncertain chemical composition), and avoid the loss of marrows in dried natural skeletons thereby making RSD skeletons superior to "real bone."

Molds: Molds for the RSD cortical bone and spongiosa were made from human skeletons consistent with the sizes of the soft tissue molds.

ICRU 44: RSD skeletons conform closely to the standards established by the International Commission on Radiation Units and Measurements (ICRU Report No. 44); mass density is reduced slightly to take into account a small decrease in calcium content for older patients.

Linear Attenuation Data

1. Monte Carlo simulation was used to calculate linear attenuation coefficients as a function of beam.
2. Monte Carlo results were validated with linear attenuation coefficients derived from Hounsfield Unit measurements at discreet energy levels.
3. RSD Phantom material linear attenuation data was compared to NIST data using ICRU Report 44 compositions of human tissues.
4. NIST data was interpolated when necessary.

MATERIALS	DENSITY (g/cc)
RSD Soft Tissue (Opaque)	1.08
RSD Soft Tissue (Transparent)	1.10
RSD Cortical Bone	1.18
RSD Trabecular Bone	1.17

RSD Soft Tissue

Energy (MeV)	Mean (HU)	Calculated (M)	μ (ICRU 44)	% Diff.	Ratio
0.08	60.3	0.1948	0.1932	0.008	0.9921
0.1	52.88	0.1797	0.1795	0.0015	0.9985
0.12	57.1	0.1717	0.1709	0.0044	0.9956
0.14	52.95	0.1623	0.1624	0.0007	1.0007
0.2	--	0.1477	0.1439	0.0261	0.9746
0.3	--	0.1245	0.1246	0.0004	1.0004
0.6	--	0.095	0.0941	0.0101	0.99
0.8	--	0.0825	0.0826	0.0013	1.0013
1	--	0.0744	0.0743	0.0018	0.9982
2	--	0.052	0.0519	0.0018	0.9982
3	--	0.0351	0.0357	0.0171	1.0174
6	--	0.0288	0.0291	0.0088	1.0088
8	--	0.0252	0.0255	0.0098	1.0099
10	--	0.0229	0.0232	0.0149	1.0151
15	--	0.0203	0.0203	0.0015	0.9985
20	--	0.0189	0.0189	0.0017	1.0017

RSD Cortical Bone

Energy (MeV)	Mean (HU)	Calculated (M)	μ (ICRU 44)	% Diff.	Ratio
0.08	1365	0.4345	0.428	0.0151	0.9851
0.1	1048	0.3496	0.3562	0.0184	1.0188
0.12	977	0.3211	0.3274	0.0191	1.0195
0.14	902	0.2932	0.2986	0.018	1.0184
0.2	--	0.2511	0.2513	0.0009	1.0009
0.3	--	0.2155	0.2137	0.0084	0.9916
0.6	--	0.1596	0.1598	0.0011	1.0011
0.8	--	0.1403	0.1402	0.001	0.999
1	--	0.1274	0.1261	0.0106	0.9895
2	--	0.0883	0.0885	0.0017	1.0017
3	--	0.0611	0.0625	0.0229	1.0235
6	--	0.0512	0.0525	0.0246	1.0253
8	--	0.0468	0.0474	0.012	1.0121
10	--	0.0446	0.0444	0.0039	0.9962
15	--	0.041	0.0409	0.0016	0.9984
20	--	0.0393	0.0397	0.0102	1.0103

RSD Trabecular Bone (Spongiosa)

Energy (MeV)	Mean (HU)	Calculated (M)	μ (ICRU 44)	% Diff.	Ratio
0.08	551	0.2849	--	--	--
0.1	515	0.2586	--	--	--
0.12	439	0.2337	--	--	--
0.14	318	0.1541	--	--	--





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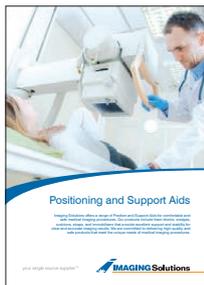
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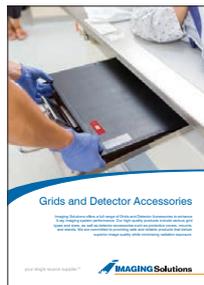
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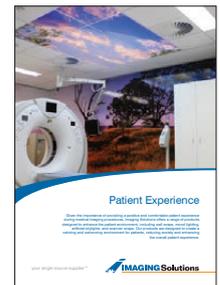
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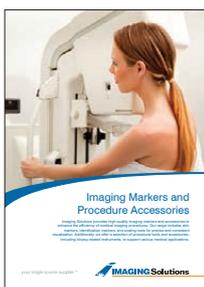
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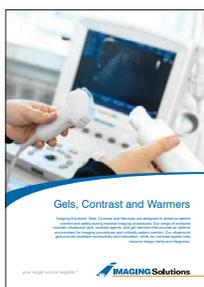
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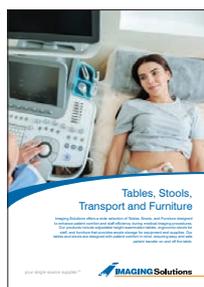
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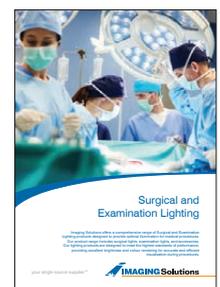
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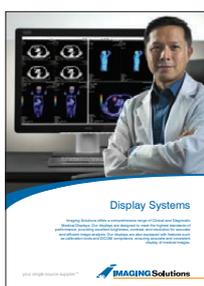
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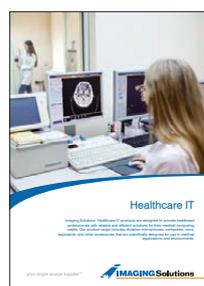
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