# KYOTO KAGAKU SKYOTOKAGAKU AMERICA RADIOLOGY PHANTOMS PRODUCT CATALOG Vol.RP-1a

T

SINCE 1948 KYOTO, TOKYO, NAGOYA AND SENDAI, JAPAN LOS ANGELES, USA HONG KONG, CHINA FRANKFURT, GERMANY DISTRIBUTORS ALL OVER THE WORLD



## PRODUCT CATALOG RADIOLOGY PHANTOMS

Vol.RP-1a



## PRODUCT CATALOG RADIOLOGY PHANTOMS CONTENTS







**ECT Hot Cold Phantom SP-6** 

# Kyoto Kagaku Anthropomorphic Phantoms

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







We provide a variety of anthropomorphic phantoms to meet your requirements that suits you best

	NEWBORN			CHILD (5-year-old)				ADULT				
	Stand	dard	Variation	5	Standard		Variations		Stand	dard		Variations
Plain X-ray	PH-50B: P.5	PH-50: P.5	PH-50 : P.5 Meconium aspiration syndrome* *Option		РН-2С:Р.6 <sub>РВU-70</sub>		PH-2D : P.7 Bone fracture		PH P1 PH-2B: P1 P.8			PH-2E : P.9 with pathologies
СТ												
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**



41350-200-16 (BMI 32)/ 41350-200-17 (BMI 40) **Body Plates** P.12▶

For separate anatomy...



PH-61 41926-000-Sectional Phantom Series P.13



**Diagnostic Radiology** 

41912-100 PH-50B Newborn Whole Body Phantom "PBU-80"

A brand-new neonate for CT has come into the world







Dosimetry

CT



X-ray

#### 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 | A hole for an ion chamber | HU of average newborn (HU 30)

#### **APPLICATIONS**

CT and plain X-ray Dosimetry | Autopsy imaging | Positioning: upright AP / supine AP / upright lateral / supine lateral

Soft tissue: urethane based resin (density: 1.07)

\*Phantom has no metal parts or liquid structure

Synthetic bone: epoxy resin (density: 1.31)

#### ANATOMY

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

#### DESCRIPTIONS

#### SET INCLUDES

1

manual

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

## SPECIFICATIONS

Phantom size: 53 cm 20.8 in

PH-50

Phantom weight: 3.5 kg / 7.7 lb

Packing size: W57 x D44 x H29 cm W22.4 x D17.3 x H11.4 in

Packing weight: 8 kg / 17.6 lb

MATERIALS

## 41912-000 Newborn Whole Body Phantom





#### ANATOMY

As per PBU-80

\*Meconium aspiration syndrome can be made per custom order

#### DESCRIPTIONS

SET INCLUDES As per PBU-80

SPECIFICATIONS Phantom height: Phantom weight: 42 cm 2.8 kg / 6.2 lb 16.5 in

Packing size: W57 x D44 x H29 cm W22.4 x D17.3 x H11.4 in MATERIALS As per PBU-80

Packing weight: 8 kg / 17.6 lb

<u>g</u> /

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 5

Kyoto Kagaku Product Lineup Web

#### PH-2C 41350-300 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**

bones / humerus / antebrachial bone / bones of hand / / heart / liver with portal and hepatic veins femur / patella / lower leg bone / bones of foot

#### Internal organs

skull / spine/ clavicles / scapulae / ribs / sternum / coxal lung with pulmonary vessels / trachea (up to primary bronchi)

#### HU numbers of each organ:

liver 70 kidney 30

#### DESCRIPTIONS

#### SET INCLUDES

- 1 pediatric whole body phantom
- head supporter
- 1 hand fixture belt

PUBLICATION REFERENCES

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

#### SPECIFICATIONS

Phantom height: 110 cm 43.3 in Phantom weight: 20 kg / 44 lb

Packing size: W86 x D60 x H32 cm W33.8 x D23.6 x H12.6 in

#### 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 **OPTIONAL PARTS** 41363-080 storage case for PH-2C / 2D

Söderberg, M., & La, S. (2013). Evaluation of adaptation strengths of CARE Dose 4D in pediatric CT. SPIE Medical Imaging, 9-14. doi:10.1117/12.2001694

g./L

ANTHROPOMORPHIC PHANTOMS

6

#### PH-2D 41350-500

Bone Fracture Pediatric Phantom "PBU-70B"

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





- | 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 approximate to human body
- | Main joints have close-to human articulation
- | Phantom can be disassembled into 10 individual parts

#### **CONCEPT** and **ANATOMY** - Is there sign of abuse?

#### **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. This phantom has been designed and developed to cultivate such observation skills in future radiologists and radiographers.

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.

#### DESCRIPTIONS

#### SET INCLUDES 1 pediatric whole body phantom 1 screwdriver head supporter hand fixture belt

set of sample X-ray data (DVD) manual

#### SPECIFICATIONS

Phantom height: 110 cm 43.3 in Phantom weight: 20 kg / 44 lb

Packing size: W86 x D60 x H32 cm W33.8 x D23.6 x H12.6 in

#### 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 OPTIONAL PARTS 41363-080 storage case for PH-2C / 2D

8/

## **APPLICATIONS**

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



SHOW MORE

X-ray



## PH-2B 41350-200





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

The phantom includes full internal organs with close-to-human HU for each.

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

#### APPLICATIONS

| CT | Plain X-ray | Basic patient positioning

ANATOMY

0	no number at ourev	Internal organs	HU number at 80KeV	
Brain		Portal and hepatic veins	40	
Cerebrum	40	Pancreas	30	
Mesencephalon	40	Kidneys	30	
Cerebellum	40	Gallbladder	20	
Cerebral ventricles	10	Spleen	50	
Eye balls	20	Seminal vesicle	25	
Arteries with contrast	25.0	Aorta	40	
medium (left half only)	250	Cava	70	
Lungs	-1000	Ureter	ureteral wall: 30 / inside: 10	
Pulmonary vessels	8	Urinary bladder	10	
Trachea	trachea wall: 8 / inside: -1000	Prostate	50	
Heart	PBU-50: 8 / PBU-60: 40	Rectum	rectum wall: 70 / inside: -800	
Liver	70	Sigmoid Colon	colon wall: 70 / inside: -800	
	Arain Cerebrum Mesencephalon Cerebellum Cerebellum Cerebral ventricles Eye balls Arteries with contrast medium (left half only) ungs Pulmonary vessels Trachea Heart iver	BrainCerebrum40Mesencephalon40Cerebellum40Cerebellum40Cerebral ventricles10Eye balls20Arteries with contrast medium (left half only)250ungs-1000Pulmonary vessels8Tacheatrachea wall: 8 / inside: -1000HeartPBU-50: 8 / PBU-60: 40iver70	BrainPortal and hepatic veinsCerebrum40PancreasMesencephalon40KidneysCerebellum40GallbladderCerebral ventricles10SpleenEye balls20Seminal vesicleArteries with contrast medium (left half only)250Aorta CavaPulmonary vessels8Urinary bladderFracheatrachea wall: 8 / inside: -1000ProstateKeartPBU-50: 8 / PBU-60: 40Rectum Sigmoid Colon	

#### DESCRIPTIONS

SET INCLUDES           1         whole body phantom           1         head supporter           1         flat head screwdriver		1 set of sample CT/X-ray data (DVD) manual	MATERIALS Soft tissue: urethane based resin (density: 1.06) Synthetic bone: epoxy resin (density: 1.31) Skull: epoxy resin (density: 1.11)
SPECIFICATIONS Phantom height: 165 cm 65 in	Packing size: W92 x D57 x W90 x D63 x W89 x D57 x	H38 cm/W36 x D22 x H15 in H22 cm/W35 x D25 x H8.7 in H16 cm/W35 x D22 x H6.3 in	<ul> <li>*Phantom has no metal parts or liquid structure</li> <li>OPTIONAL PARTS</li> <li>41363-070 storage cases (consist of 2 boxes)</li> <li>41350-200-16 body plates for PH-2/2B (BMI 32)</li> </ul>
Phantom weight: 50 kg / 110 lb	Packing weigh 80 kg / 176 lt	it: D	41350-200-17 body plates for PH-2/2B (BMI 40)
PUBLICATION REFERENCE	CES Kim, S., & Jur Of Technolog	ng, H. (2013). A Study on Performance of L y, 4(2), 178-187. doi:10.14716/ijtech.v4i2	ow-Dose Medical Radiation Shielding Fiber (RSF) in CT Scans. International Journa 107

8

Storage case P.12♪

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC.

ξ.)

Kyoto Kagaku Product Lineup Web

## PH-2E |41350-700 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

**ANATOMY and PATHOLOGY** 

Phantom can be disassembled into 10 individual parts





#### APPLICATIONS

|CT |Plain X-ray |Basic patient positioning

HU number at 80KeV	Cases	HU number at 80KeV	Cases	HU number at 80Ke
130	Hepatic tumor	10	Kidney stone	170
90	Pancreatitis	30	Appendicitis	inside: 30 / outside: 4
inside: 30 / outside: 130	Gall stone	170	Spondylolisthesis	-
	HU number at 80KeV 130 90 inside: 30 / outside: 130	HU number at 80KeVCases130Hepatic tumor90Pancreatitisinside: 30 / outside: 130Gall stone	HU number at 80KeVCasesHU number at 80KeV130Hepatic tumor1090Pancreatitis30inside: 30 / outside: 130Gall stone170	HU number at 80KeVCasesHU number at 80KeVCases130Hepatic tumor10Kidney stone90Pancreatitis30Appendicitisinside: 30 / outside: 130Gall stone170Spondylolisthesis

Full internal	Internal organs	HU number at 80KeV	Internal organs	HU number at 80KeV	
organs	Brain		Portal and hepatic veins	40	
	Cerebrum	40	Pancreas	30	
Rony structure	Mesencephalon	40	Kidneys	30	
Synthotic skull	Cerebellum	40	Gallbladder	20	
Synthetic Skull	Cerebral ventricles	10	Spleen	50 25	
	Eye balls	20	Seminal vesicle		
Vertebrae	Arteries with contrast	25.0	Aorta	40	
Clavicles	medium (left half only)	250	Cava	70	
Ribs	Lungs	-1000	Ureter	ureteral wall: 30 / inside: 10	
Sternum	Pulmonary vessels	8	Urinary bladder	10	
Scapula	Trachea	trachea wall: 8 / inside: -1000	Prostate	50	
Coxal bones	Heart	PBU-50: 8 / PBU-60: 40	Rectum	rectum wall: 70 / inside: -800	
Femurs	Liver	70	Sigmoid Colon	colon wall: 70 / inside: -800	

#### DESCRIPTIONS

#### SET INCLUDES

- 1 whole body phantom
- head supporter
   flat head screwdriver

i itat neau sciewul

SPECIFICATIONS Phantom height: 165 cm 65 in Phantom weight: 50 kg / 110 lb Packing size: W92 x D57 x H38 cm/W36 x D22 x H15 in W90 x D63 x H22 cm/W35 x D25 x H8.7 in W89 x D57 x H16 cm/W35 x D22 x H6.3 in Packing weight:

manual

1 set of sample CT/X-ray data (DVD)

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

OPTIONAL PARTS

41363-070	storage cases (consist of 2 boxes
41350-200-16	body plates for PH-2/2B (BMI 32)
41350-200-17	body plates for PH-2/2B (BMI 40)

8.7

ANTHROPOMORPHIC PHANTOMS

Storage case P.12 ►

Ω

9

## PH-2 |41350-000 Whole Body Phantom "PBU-50"

X-ray

#### An essential asset for every radiography program





#### 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 | Basic patient positioning | Basic CT

#### ANATOMY

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

#### DESCRIPTIONS

#### SET INCLUDES

- 1 whole body phantom
- 1 head supporter

#### 1 flat head screwdriver

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

Packing size: W92 x D57 x H38 cm/W36 x D22 x H15 in W90 x D63 x H22 cm/W35 x D25 x H8.7 in W89 x D57 x H16 cm/W35 x D22 x H6.3 in Packing weight: 80 kg / 176 lb

manual

1 set of sample X-ray data (DVD)

#### 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

#### **OPTIONAL PARTS**

41363-070	storage cases (consist of 2 boxes)
41350-200-16	body plates for PH-2/2B (BMI 32)
41350-200-17	body plates for PH-2/2B (BMI 40)

Storage case P.12 ▶

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 10

#### **Diagnostic Radiology**

## PH-60 | 41925-000 Tough Whole Body Phantom "PBU-90 RUGGED"

#### New phantom material is designed for rough handling, improved durability and less maintenance









#### 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 | Basic patient positioning | Basic CT

PBU-90 allows training scenarios that involve rough handling. Details of the bones in the hands and the feet are simplified compared to those of PBU-50/60 for increased durability.

#### ANATOMY

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

#### DESCRIPTIONS

#### SET INCLUDES

- 1 whole body phantom
- head supporter
   flat head screwdriver
- I Ital Head Screwul

SPECIFICATIONS Phantom height: 165 cm 65 in

Phantom weight:

50 kg / 110 lb

Packing size: W92 x D57 x H38 cm/W36 x D22 x H15 in W90 x D63 x H22 cm/W35 x D25 x H8.7 in W89 x D57 x H16 cm/W35 x D22 x H6.3 in Packing weight: 80 kg / 176 lb

manual

1 set of sample X-ray data (DVD)

#### MATERIALS

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

#### OPTIONAL PARTS

41363-070	storage cases (consist of 2 boxes)
41350-200-16	body plates for PH-2/2B (BMI 32)
41350-200-17	body plates for PH-2/2B (BMI 40)

X-ray

Storage case P.12 ▶

б Куо

41350-200-16 (BMI 32) / 41350-200-17 (BMI 40) Body plates Optional Parts for PH-2/2B/2E/60

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



#### FEATURES

| For study of effect of patient size on radiation dose and image quality.

#### DESCRIPTIONS

#### SET INCLUDES

body plate (front)
 body plate (back)

2 belts

#### SPECIFICATIONS

Phantom size: W41 x D45 x H28cm W16.1 x D17.7 x H11 in

Packing size: 77 x 48 x 40 cm x 2 boxes 30.3 x 18.9 x 15.7 in x 2 boxes

#### MATERIALS

Urethane based resin (density: 1.06)

Packing weight: 41350-200-16(BMI 32): 21 kg / 46.3 lb 41350-200-17(BMI 40): 34.5 kg / 76 lb

## <sup>41350-000-11</sup> Fractured Hand/Forearm Phantom PH-2/2B

#### X-ray phantom for trauma evaluation



#### DESCRIPTIONS

#### Bone Fractures:

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

#### SET INCLUDES

41363-070

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

8.7



## Storage case 2 (a pair)

Optional Parts for PH-2/2B/2E/60

Kyoto Kagaku Product Lineup Web

Q

Optional Parts for PH-2/2B/2E/60

## Diagnostic Radiology

## PH-61 | 41926-000-Sectional Phantom Series

X-ray

#### 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

ITEMS			
REGION	N0.	PRODUCT NAME	NOTE
	41926-000	Head (Opaque)	Stand-alone design can be used with the adjustable head positioning stand to
	41926-010	Head (Transparent)	Includes thoracic skeletal_system with embedded mediastinal space and bronchus to
	41926-070	Thorax (Transparent)	provide realistic imaging. The scapulae are rotated outside of the lung fields for proper PA chest imaging
7/1	41926-080	Pelvic (Opaque)	Includes lumbar/sacral spine, pelvic bony anatomy and proximal femurs
11	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)	
1	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,
	41926-190	Right Knee (Transparent)	oblique, sunrise and tunnel views
	41926-100	Right Foot (Opaque)	
	41926-110	Right Foot (Transparent)	
	41926-120	Left Foot (Opaque)	
	41926-130	Left Foot (Transparent)	

#### DESCRIPTIONS

#### SET INCLUDES (each)

phantom
 set of sample X-ray data (DVD)

1 set of sample X-1 manual \*Accessory of head phantom: 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

SJ\_\_\_\_ Kyot

# CHEST PHANTOMS

# Kyoto Kagaku Chest Phantom Family

Thorax contains organs crucial for our lives, and lung cancer remains to be the top cancer. Here's a family of chest phantoms that support pursuit for better diagnosis and treatment.

## Pursuit of low-dose

PH-58 Subsolid Nodules

**Extensive possibilities** for study and training

Attach the simulated tumors & Improve interpretation skills

PH-8 Lung Cancer Screening CT Phantom LSCT001



PH-IC Pediatric Chest Phantom



Chest plates for "LUNGMAN"



Modality variation

Radiotherapy



PH-39 Dynamic Thorax Phantom



PH-1 Multipurpose Chest Phantom N1 "LUNGMAN"

Components for Radioisotope for "LUNGMAN"





PH-65 PET/SPECT Thorax Phantom

#### PH-1 41337-000 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









CT

X-ray

#### FEATURES

Radiation absorption and HU number approximate to human body Simulated tumors and other targets can be attached at any points in the lung fields

I CT

APPLICATIONS

| Plain X-ray | Radiographic interpretation

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

#### ANATOMY

#### Chest includes;

| main body: synthetic bones are embedded I mediastinum:

heart, trachea pulmonary vessels | abdomen (diaphragm) block: no internal structure



Simulated tumors in five-size and three-HU-number variations can be attached to arbitrary position in the lung field.



#### DESCRIPTIONS

#### SET INCLUDES 1 chest torso

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

#### SPECIFICATIONS

Phantom size: Packing size: 43 x 20 x 48 cm, chest girth 94 cm 63 x 50 x 29 cm 17 x 8 x 18 in, chest girth 37 in 24.8 x 19.7 x 11.4 in Phantom weight: Packing weight: 18 kg/ 39.6 lb 25 kg / 55.1 lb







PUBLICATION Xie, X., Zhao, Y., Snijder, R. A., van Ooijen, P. M., de Jong, P. A., Oudkerk, M., … Greuter, M. J. (2013). Sensitivity and accuracy of volumetry of pulmonary REFERENCES nodules on low-dose 16- and 64-row multi-detector CT: an anthropomorphic phantom study. European radiology, 23(1), 139–147. REFERENCES doi:10.1007/s00330-012-2570-7

Gomi, T., Nakajima, M., Fujiwara, H., Umeda, T. (2011) Comparison of Chest Dual-energy Subtraction Digital Tomosynthesis Imaging and Dual-energy Subtraction Radiography to Detect Simulated Pulmonary Nodules with and without Calcifications. Academic Radiology, 18(2), 191–196. doi:10.1016/j.acra.2010.09.021

**Diagnostic Radiology** 

## **Optional Parts for PH-1**



## **Components for Radioisotope**

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









**Optional Parts for PH-1** 

fusion



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

#### DESCRIPTIONS

41337-020-

- MATERIALS
- Container: acrylic resin Liver: acrylic resin Heart: urethane based resin

Lung and pulmonary nodule: urethane based resin

PFT

## PH-58 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



41923-200 No.11-12 Eccentric

Itera Ne	GGO f	ield	Solid fie	eld	Turne
item No.	Diameter	HU	Diameter	HU	Type
11	2.0 cm	650	0.3 cm/0.12 in 0.5 cm/0.20 in	0	Eccentric
 12	0.79 in	-050	0.5 cm/0.20 in 0.7 cm/0.28 in	0	

#### 3D GGO

	Itom No	GGO	field	Solid	Turne				
	item No.	Diameter	HU	Diameter	HU	Type			
	3D-GGO	1.5 x 1.5 cm 0.59 x 0.59 in	-590	-	-	-			

#### 41923-100 No.8-10 Eccentric



#### 41923-300 No. a-h Pure GGO

Itom No.	GGO field		Solid	field	Turno
itemino.	Diameter	HU	Diameter	HU	Type
а		-750	-	-	Pure GG
b		-650	-	-	
С		-550	-	-	
d	1.5 cm	-450	-	-	
е	0.59 in	-350	-	-	
f		-250	-	-	
g		-150	-	-	
h		-50	-	-	

## PH-1C | 41337-300 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

#### 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

#### DESCRIPTIONS

#### SET INCLUDES

- 1 five-year-old chest torso
- 1 lung vasculature insert: mediastinum with pulmonary vessels

#### 1 lung density insert: mediastinum, lung fields (L $\cdot$ R)

#### SPECIFICATIONS

Phantom size: 32 x 17 x 38 cm 12.6 x 6.7 x 15 in Phantom weight: 6 kg / 13.3 lb Packing size: W51 x D43 x H45 cm W20 x D17 x 17.7 in Packing weight: 14 kg / 30 lb

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



CT

X-ray



| Radiographic interpretation

**APPLICATIONS** 

Plain X-ray

Dosimetry

|CT

Dosimetry



#### 41927-000 PH-63 **PET/SPECT** Thorax Phantom



#### PET/ SPECT Thorax Phantom is an optimal tool for study in nuclear medicine







**APPLICATIONS** | PET/SPECT



#### FEATURES

### Examination of myocardial density through SPECT imaging

- | Verification of myocardial imaging with the use of various RI solution densities
- | Ability to capture defects of the myocardial region
- | Can reproduce image variations of the heart by injecting RI solutions in the liver, kidney and lungs

#### 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

## ANATOMY

HU

- | Liver |Lung (right/left) | Kidney (right/left) | Hot spots (liver, lungs and breast)
- \* 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

| Heart

- Anatomical type:

- Geometric type:

and myocardium

right ventricle, left ventricle

left ventricle and myocardium



Geometric type

| Quality management of NM equipment

| Myocardial density with SPECT imaging

| RI solution density for tumor imaging

Anatomical type

### DECCDIDTIONS

DESCRIPTIONS		
SET INCLUDES	*S: Several	MATERIALS
1 thorax body	1 base	Soft tissue: transparent polyurethane
2 lungs (left and right)	S* plastic pins	Lungs: materials with density 0.4 g/cm3
4 hearts	6 supporting bars	Bone materials: Calcium infused material to provide proper
1 liver	4 flat bar rings for base	attenuation with use of RI solutions
2 kidneys	5 tubes	
1 rib cage and spine	1 syringe	SPECIFICATIONS
2 breasts	S* nuts and bolts	Phantom size: Phantom weight:
3 hot spots	1 water tank	W44 x H69.4 cm phantom itself: 21 kg / 46.2 lb
	manual	W17 3 x H27 3 in when filled with liquid: 37 5 kg / 82 6 lb

CHEST PHANTOMS

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 18 g. /

filled with liquid: 37.5 kg / 82.0 iu

Q Kyoto Kagaku Product Lineup Web

41507-000 PH-8

Lung Cancer Screening CT Phantom LSCT001

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







| CT image quality evaluation

| Evaluation of density curve

**APPLICATIONS** 

| Dosimetry



Dosimetry

| 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

FEATURES

#### ANATOMY

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

#### Simulated tumors

ltı

lŧι

	HU contrast with the	size	materials
umors 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
umors 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

Chest wall: human tissue substitute

Alveoli: styrene foam and urethane foam

Bones: synthetic bones

#### Linearity phantom targets

1 adjustment base

manual

1

set of sample images

	· · · · · · · · · · · · · · · · · · ·	J				
						materials
А	-1000	air		Е	-200	polyurethane
В	-850	polyurethane		F	100	polyurethane
С	-600	polyurethane		G	250	bakelite
D	-400	polyurethane		н	350	polyacetal resin
					· · · · · · · · · · · · · · · · · · ·	

MATERIALS



Q

#### DESCRIPTIONS

#### SET INCLUDES

- 1 chest phantom 8 step linearity phantom
- 1 urethane cylinder

#### SPECIFICATIONS

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

PUBLICATION REFERENCES

Muramatsu, Y., Tsuda, Y., Nakamura, Y., Kubo, M., Takayama, T., & Hanai, K. (2003). The Development and Use of a Chest Phantom for Optimizing Scanning Techniques on a Variety of Low-Dose Helical Computed Tomography Devices. Journal of Computer Assisted Tomography, 27(3), 364-374. doi:10.1097/00004728-200305000-00012

Kyoto Kagaku Product Lineup Web

PH-4 |41324-040 CT Torso Phantom CTU-41

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





СТ

X-ray



APPLICATIONS

# 

#### FEATURES

| One-piece structure of the phantom facilitate study in volume | CT CT scan including helical scan.

| The phantom can be used for alignment in Image Guided Radiation Therapy (IGRT)

#### 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	Whole	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 C	lostae	90	L		

DESCRIPTION	S			
SET INCLUDES				MATERIALS
1 CT torso phanton 1 set of sample X-r	m ay data (DVD)	1 storage case manual		Soft tissue: urethane based resin (density: 1.06) Synthetic bone: epoxy resin (density: 1.31)
SPECIFICATIONS Phantom height:	Phantom weight:	Packing size:	Packing we	ight:
100 cm 39.4 in	45 kg / 99 lb	W118 x D63 x H47 cm W46.5 x D24.8 x H18.5 in	52 kg / 114	4 lb

\_ all the second secon

PH-3 41309-100 for CT/ 41309-200 for Angio/ 41309-300 for MECT



## Angiographic CT Head Phantom ACS

Kyoto Kagaku's best-selling CT head phantom A new variation added: Head Phantom for MECT, which contains arteries of innovative water equivalent material







СТ



Q

#### FEATURES

ANATOMY

| 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

APPLICATIONS

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

#### | A synthetic skull | Soft tissue | Simulated arteries with contrast medium Left anterior cerebral arteries Left middle cerebral arteries Internal carotid artery Diameters of simulated0.5-4.0 mm \*Arrangement of arteries are the same for all three types. I HU Soft tissue 0 Cerebellum 40 Cerebral ventricles Cerebrum 40 10 40 20 Mesencephalon Eye balls Middle cerebral artery Anterior cerebral artery

DESCRIPTION	S			
SET INCLUDES				MATERIALS
<ol> <li>head phantom</li> <li>set of sample X-ratio</li> </ol>	ay data (DVD)	1 storage case manual		Soft tissue: urethane based resin Cervical vertebrae (C1-C7): epoxy resin
SPECIFICATIONS				
Phantom height: 33 cm 13 in	Phantom weight: 5.25 kg / 11.57 lb	Packing size: W46 x D31 x H32 cm W18.1 x D12.2 x H12.6 in	Packing wei 8 kg / 17.6	ght: b

#### 🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 21

Kyoto Kagaku Product Lineup Web

PH-76 | 41301-300 (Two-way set) / 41301-500 (Mouth closed) / 41301-400 (Mouth open) Dental Radiography Head Phantom Two-way set



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



#### FEATURES

- | Separately modeled each tooth has a three-layer structure of enamel, dentin | Dental radiography 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

#### **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

#### DESCRIPTIONS

#### SET INCLUDES

- 1 main head unit
- upper jaw (alveolar bone)
- lower jaw (alveolar bone) tongue

#### SPECIFICATIONS

Phantom size: W20 x D21 x H25 cm W7.8 x D8.2 x H9.8 in Phantom weight: 4.8 kg / 10.6 lb

storage case manual Packing size: W66 x D54 x H34 cm

1 fixation base (including screws)

set of sample X-ray data (DVD)

W44 x D21 x H13.3 in Packing weight: 12 kg / 26.4 lb

tripod

1

#### MATERIALS

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



lower jaw with implant \*mouth closed type

Q



PUBLICATION REFERENCES

Kitai N, Mukai Y, Murabayashi M, Kawabata A, Washino K, Matsuoka M, Shimizu I, Katsumata A. Measurement accuracy with a new dental panoramic radiographic technique based on tomosynthesis. Angle Orthodontist. 2013; 83, No 4. Read more: http://www.ncbi.nlm.nih.gov/pubmed/22612390

#### **APPLICATIONS**

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

KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 22 Kyoto Kagaku Product Lineup Web

PH-5 41360-000 for CT / 41360-100 for MFCT



## **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 13mgI/ml\*\* iodine and the liver of multi-energy CT compatible material)

**APPLICATIONS** 

I CT | Multi energy CT

#### \*\*Concentration of iodine can be custom-ordered.

#### ANATOMY

| lungs (no internal structure) | heart (no internal structure) I liver | portal vein | gallbladder

| hepatic vein hepatic artery kidneys pancreas | spleen

| aorta I 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 water equivalent material (WEM).->see P 28 for more information.

The below right graph shows WEM's high water-equivalency through wide energy range



#### DESCRIPTIONS SET INCLUDES MATERIALS Soft tissue: urethane based resin (density: 1.06) 1 abdomen phantom 1 storage case set of sample X-ray data (DVD) Synthetic bone: epoxy resin (density: 1.31) manual SPECIFICATIONS Phantom size: Phantom weight: Packing size: Packing weight: W27 x D16 x H28 cm W44 x D39 x H42 cm 12 kg / 26.4 lb 19 kg / 42 lb W10.6 x D16 x H11.8 in W17.3 x D15.3 x H16.5 in

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 23 Kyoto Kagaku Product Lineup Web

#### **Diagnostic Radiology**

## PH-18 41311-000 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 | Pathology includes early cancer and gastric ulcer

## APPLICATIONS

MATERIALS

| Double contrast gastrography

#### DESCRIPTIONS

#### SET INCLUDES

stomach phantom
 storage case

#### SPECIFICATIONS

PH-19

Phantom size: W30 x D20 x H33 cm W11.8 x D7.9 x H13 in Phantom weight: 16 kg / 35.3 lb

**Rotation Stomach Phantom TMP-R** 

41312-010

Packing size: W51 x D39 x H51 cm W20 x D15.3 x H20 in Packing weight: 20 kg / 44 lb

Soft tissue: urethane based resin (density: 1.31)



X-ray

#### Rotational 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
- | Pathology includes early cancer and gastric ulcer

#### APPLICATIONS

| Double contrast gastrography

DESCRIPTIONS SET INCLUDES MATERIALS 1 stomach phantom 1 phantom holder Urethane based resin / epoxy resin rotation unit model of lesions **OPTIONAL PARTS** 1 controller 1 storage case 41312-010-01 Extension bar SPECIFICATIONS Phantom size: W25 x D18 x H28 cm W9.8 x D7.1 x H11 in

🕻 🕻 KYOTO KAGAKU 🥎 KYOTOKAGAKU AMERICA INC. 🛛 24

#### **Diagnostic Radiology**

## 41362-000 PH-46



30

-800

CT Prostate Phantom

#### Excellent phantom for therapy planning of prostate cancer



#### ANATOMY

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

#### DESCRIPTIONS

#### SET INCLUDES

1 phantom set of sample X-ray data (DVD) **SPECIFICATIONS** Phantom height: 35 cm / 13.7 in

1 storage case manual

Packing size:

W44 x D39 x H42 cm / W17.3 x D15.3 x H16.5 in

Synthetic bone: epoxy resin (density: 1.31) Packing weight: 27 kg / 59.5 lb

Soft tissue: urethane resin (density: 1.06)

MATERIALS

Prostate

eminal vesicles Bladder surface

Rectal surface

Rectal inner cavity

X-ray

#### PH-71 41935-000 Knee Ligament Phantom

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







Q

CT

#### FEATURES

#### APPLICATIONS

Kyoto Kagaku Product Lineup Web

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

#### ANATOMY

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

DESCRIPTIONS		
SET INCLUDES           1         knee phantom           1         storage case	manual	MATERIALS Soft tissue: urethane based resin (density: 1.06) Synthetic bone: epoxy resin (density: 1.31)
SPECIFICATIONS Phantom size: 14 dia. x 45(H) cm	Phantom weight: 4.5 kg / 10 lb	

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 25

5.5 dia. x 17.7(H) in

8.7

## PH-49 | 41910-000 CT Colonography Phantom NCCS



#### Innovative study tool for safe and effective CT Colon screening

Product supervision: National Cancer Center (Japan)







#### 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 | Evaluation of accuracy of measurement (size, volume) has six targets lining in sequence on the inner wall of the unit | Study on optimal density of contrast media
 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

#### VARIATION of Simulated Tumors

#### b Depressed I: fixed diameter Depressed II: fixed height a: Outer b: Inner a: Outer b: Inner c: Height c: Height diameter diameter diameter diameter 0.2 cm/0.07 ir 1.0 cm/0.39 in 0.5 cm/0.2 in Depressed type 0.15 cm/0.06 ir 0.7 cm/0.27 in 0.35 cm/0.13 in -2 variations-0.7 cm/ 0.27 in 0.35 cm/ 0.13 in 0.1 cm/0.03 in 0.5 cm/0.20 in 0.25 cm/0.1 in 0.1 cm/ 0.3 cm/0.11in 0.15 cm/0.06 in 0.03 in 0.025 cm/0.01 in 0.2 cm/0.07 in 0.1 cm/0.03 ir Virtual Endoscope View 0.015 cm/0.005 ii 0.1 cm/0.03 in 0.05 cm/0.02 ir Projection I: fixed diameter Projection II: fixed ratio a: Diameter b: Height a: Diameter b: Height b 0.7cm/0.27 in 1 cm/0.4 inch 1.0 cm/0.39 in Projection type 0.5 cm/0.20 in 0.7 cm/0.27 in 0.7 cm/0.27 in -2 variations-1.0 cm/ 0.3 cm/0.11in 0.5 cm/0.2 in 0.5 cm/0.20 in 0.4 in 0.2 cm/0.07 in 0.3 cm/0.11in 0.3 cm/0.11in а 0.1 cm/0.03 in Virtual Endoscope View DESCRIPTIONS SET INCLUDES 1 lower torso phantom 3 plugs for colon unit hole 1 base holder acrylic container plug with ion chamber hole storage case types of colon units plug for ion chamber hole manual holder for colon unit MATERIALS SPECIFICATIONS Packing weight: Packing size: Soft tissue: urethane based resin (density: 1.06) W63 x D50 x H29 cm 32 kg / 70.5 lb Synthetic bone: epoxy resin (density: 1.31) W24.8 x D19.6 x H11.4 in

🕻 🕻 KYOTO KAGAKU 🥎 KYOTOKAGAKU AMERICA INC. 🛛 26

## 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

Q

Kyoto Kagaku Product Lineup Web

#### PH-51 41913-000 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

#### Product supervision:

Dr. David Wilson MBBS, BSc, MFSEM, FRCP, FRCR Consultant Radiologist St Luke's Hospital Oxford Senior Clinical Lecturer University of Oxford





"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 L2-L5 can be visualized under X-ray.

[True-to-life sensation when penetrating tissue and bones

1 syringe

manual

W52 x D44 x H30 cm

W20.4 x D17.3 x H11.8 in

1

Packing size:

irrigation bag

storage case

TRAINING SKILLS

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

#### ANATOMY

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

#### DESCRIPTIONS

#### SET INCLUDES

- 1 Jumbar torso
- vertebroplastv block 1 anesthesia block
- skin cover

#### SPECIFICATIONS

Phantom size: W33 x D21 x H30 cm

W13 x D8.2 x H11.8 in

#### **RELATED PRODUCTS**

Ultrasound Compatible Lumbar Puncture/Epidural Simulator M43E/ 11348-500

## MATERIALS

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

#### **REPLACEMENT PARTS**

41913-000-01 41913-000-02 11348-150

anesthesia block vertebroplasty block skin cover



| Ultrasonic anatomy and needle access training



## Kyoto Kagaku New Lineup Multi-Energy CT Phantoms

## For Quality Assurance and Research

## **OVERVIEW**

Multi-Energy CT (MECT) or Dual Energy CT (DECT) is a new frontier of rapidly advancing medical imaging, and now entering clinical practices in hospitals.

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

Such features are expected to bring us better diagnosis, improved image quality, reduction of radiation exposure, reduction of contrast agent volume and opens possibility of functional imaging.

Meanwhile, further studies are awaited in various field such as quality management of CT equipment, verification of protocols, expansion of clinical application, to derive the maximum benefits from the technology.

Kyoto Kagaku supports researchers and clinicians with up-to-date innovative phantoms.

## BACKGROUND

In many MECT/DECT studies, water phantoms have been used. However, using real water can impose considerable work in preparation and handling. At the same time, using acrylic containers limits the design of phantoms.



complex and detailed shapes custom-ordered including anatomical structures Contact us! **CT Abdomen Phantom** Abdomen with MECT compatible vessels and liver P.23▶ Multi Energy CT Quality Assurance Phantom Phantom for quality assurance. Angiographic CT Head Phantom ACS P.30► A variety of research samples can Head with MECT compatible arteries Sample product be inserted using small containers. P.21 ▶ Gout Foot Phantom

28

## Vital factor for Multi-Energy-CT Phantom "Water Equivalent Material"



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

Co-developed with; Professor Ichikawa Katsuhiro, Faculty of Health Sciences, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University, Japan





## Supports iodine quantification and materialdecomposition

Unlike conventional "water substitute" materials the Water Equivalent Material maintain water equivalency under low energy range. This feature support studies that involve iodine quantification.

## Save time and trouble for study and expand possibilities

Save time, costs and efforts to design and produce custom acrylic water phantoms.

Unlike water phantoms, phantoms with solid materials reduce the troublesome process to change water and inside 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 may save time and cost of preparing custom made phantoms for the researchers.

2. Water Equivalent Material (WEM) enable to create phantoms with innovative designs while ensuring credibility of water phantoms.

#### PH-75B 41941-100 (TR-I) PH-75A 41941-000 (TR-J) Multi Energy CT Quality Assurance Phantom



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

Co-developed with: Katsuhiro İchikawa, Ph.D., Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University



#### FEATURES

| Phantom using innovative Water Equivalent Material

| Empty bottles enable to put various items and check how they | react to Multi Energy CT

- | Save time and efforts to produce custom-made water phantoms | Reduction of contrast media
- | Two different sizes of body. (TR-I, TR-J)

Inserts			
Color	Name	Size	Qty
Silver	Water Equivalent Material Inserts	¢20mm	8
Red	Titanium Insert	¢12mm	1
Blue	Soft tissue (equivalent to liver)	Φ20mm	1
Blue	lodine concentration 4mgl/mL	\$20mm	1
Blue	lodine concentration 8mgl/mL	φ20mm	1
Transparent	Iodine concentration 12mgl/mL	\$ 20mm	1
	Water container	φ20mm	1
	Empty bottle with spacer *for experiment		20

#### DESCRIPTIONS

#### SET INCLUDES









#### **APPLICATIONS**

Study for ME-ĆT image analysis protocol Metal artifact reduction

#### **EVALUATION PARAMETERS**

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



🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 30

#### PH-74 41938-000 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

## **APPLICATIONS**

Bone scintigraphy Bone SPECT/CT NaF-PET

8.7

#### **EVALUATION PARAMETERS**

**Visual Evaluation** | Tumor detectability Image distortion | Artifact

#### Quantitative Evaluation

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

#### Other

correction and attenuation correction

Kyoto Kagaku Product Lineup Web

Q

CT SPECT SPECT/ CT



## PH-55 | 41920-100 CT ERF Phantom HIT



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







FEATURES	APPLICATIONS
The phantom is designed to physically and quantitatively evaluate	I CT
iteratively reconstructed images in the low CNR area, such as abdomen,	

where MTF of PSF is less useful

| The phantom uses edge spread function (ESF) to calculate MTF of the low CNR images, which facilitate assessing performance properties of iteratively reconstructed images under low CNR

philips screw driver

extra screws

storage case

manual

▼Modulation Transfar Funcion image slice thickness 0.5mm



#### DESCRIPTIONS

#### SET INCLUDES

- 1 cylindrical container (200 mm dia.)
- 5 measurement plates
- 1 rotation holder
- petroleum jelly
   angle adjustment holder
- i ungle dajustment noi
- SPECIFICATIONS

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

 MATERIALS

 1 fixture for the cylindrical container

 Acrylic res

Acrylic resin, polyurethane



41919-010 Angle adjustment holder (table-top type) \*included in the set Compatible with PH-9

KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 32

S / Kyoto I



## PH-56 | 41921-000 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



For verification of the spatial interval in reconstruction Stainless steel line: 0.1 mm/0.004 in dia.



For calculation of slice thickness using  $\ensuremath{\mathsf{FWHM}}$ 

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 x 150 mm/2.8 x 5.9 in

## Uniformity unit



For evaluation of uniformity and tilting of the examination table 70 x 150 mm/2.8 x 5.9 in

#### Height setting rack



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

#### DESCRIPTIONS

uniformity unit

#### SET INCLUDES

1 reconstruction positioning unit 1 slice thickness unit

#### unit height setting rack manual

#### MATERIALS

Acrylic resin, bakelite, aluminum, copper, stainless

#### SPECIFICATIONS

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

Kyoto Kagaku Product Lineup Web

#### PH-59 41924-000

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

**Evaluation Parameters** 



#### FEATURES

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

Computed Tomography Dose Index (CTDI) | Dose profile

#### DESCRIPTIONS

SET INCLUDES 1 head phantom body phantom 1 filling rods 10 manual

SPECIFICATIONS Phantom size: 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

Acrylic resin

MATERIALS



41919-000

## CT QA Phantom JCT II



#### Renovated CT QA phantom for initial test at the time of reception, as well as follow-up periodical quality check of CT scanners



#### 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



**EVALUATION PARAMETERS** 

| Axial scan:

Slice thickness / spatial resolution / low contrast resolution / noise / mean HU number / uniformity

| Helical scan: Slice thickness



🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 34

#### PH-9 41334-000 Multi Slice CT Phantom MHT





The phantom can be used for features of CT evaluation such as high and low contrast resolutions, feed direction and CTDI



#### FEATURES

| Non-aqueous/Easy Set-up enables liquid-free evaluation session | CT | The phantom is designed to allow evaluation in volume scanning

#### **EVALUATION PARAMETERS**

#### I CTDI

| Contrast resolution Sensitivity profile

| Contrast-to-Noise Ratio (CNR) evaluation | Evaluation of effective slice thickness SSPz evaluation

#### DESCRIPTIONS

- SET INCLUDES 1 low contrast phantom
  - 1 high contrast phantom
  - 1 elliptical absorber

**APPLICATIONS** 

MATERIALS Acrylic resin, polyurethane **OPTIONAL PARTS** 41334-110 sliding phantom holder

1 micro disc phantom angle adjustment holder 1 storage case low contrast phantom with CTDI manual



#### PH-7 41339-010-**CT-AEC** Phantoms

#### Four types of phantoms designed to evaluate CT-AEC performance





#### **FEATURES**

**APPLICATIONS** 

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

#### 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

Q

#### DESCRIPTIONS

SET INCLUDES (per each)

1 phantom with an attachment bracket

MATERIALS

## Acrylic resin

PRODUCT VARIATIONS

41339-010 Cone (Apollo Phantom) 41339-020 Elliptical Cone Phantom

41339-030 Stepped Cylinder Phantom

41339-040 Variable XY Phantom

\*each phantom can be ordered individually

PUBLICATION REFERENCES Muramatsu, Y., Ikeda, S., Osawa, K., Sekine, R., Niwa, N., Terada, M., . . . Miyazaki, S. (2007). Performance evaluation for CT-AEC(CT automatic exposure control)systems. Japanese Journal of Radiological Technology, 63(5), 534-545. doi:https://doi.org/10.6009/jjrt.63.534



#### PH-6B 41310-020 Dynamic Cardiac CT Phantom MD-CT



#### For evaluation and research in ECG gating cardiac and thoracic CT



#### FEATURES

The heart phantom is made of human tissue substitute

Simulated coronary arteries including stenosis can be attached to the wall of the phantom heart

The phantom generates pulses that are synchronized with the cardiac movement for ECG gating

| Controllable parameters include pulse rate, ejection volume and ejection fraction

| Operation with the touch panel controller is simple and easy

#### DESCRIPTIONS

#### SET INCLUDES

- 1 drive unit
- heart phantoms 3 1 protective cover
- set of simulated coronary arteries controller 1 storage case

#### PH-9-2 41334-120 Ladder Phantom



Evaluation of spatial resolution if simulated contrast enhanced vessels in CT



#### FEATURES

On each plate phantom of 5 mm thickness, five slits of 5 mm length are made to represent vessels Nine variations of vessel width are prepared

#### **APPLICATIONS**

| Evaluation of spatial resolution of simulated contrast enhanced vessels in CT

| Measurement of the left ventricle

| Image quality evaluation of coronary

ejection fraction (EF)

arteries

#### DESCRIPTIONS SET INCLUDES MATERIALS Measurement region: epoxy resin, hydroxyapatite 1 outer phantom Base: acrylic resin 9 ladder phantoms 1 storage case **OPTIONAL PARTS SPECIFICATIONS** 41339-060 Angle adjustment holder for GE Vessel width: Vessel length: 5 mm/ 0.19 in 41339-050 Angle adjustment holder for cannon 0.3, 0.4, b0.6, 0.7, 0.8, 1.0, 1.2, 1.5 mm (5 mm thick, with 5 lines of 0.012, 0.016, 0.024, 0.028, 0.032, 0.039, 0.047, 0.059 in \*Specify the manufacturer and type of the scanner vessels each)

🕻 KYOTO KAGAKU 🥎 KYOTOKAGAKU AMERICA INC. 37

Kyoto Kagaku Product Lineup Web

#### 41329-010 PH-13 **Digital Mammographic Phantom NCCE**



#### Four types of phantoms designed to evaluate CT-AEC performance Image guality can be evaluated by noise and S.D. on the phantom section images



#### FEATURES

Outer shape of the phantom simulates a compressed breast of D shape | Contrast resolution [Targets includes simulated microcalcifications, nylon fibrils, acrylic | Frequency enhancement disks, an aluminum ring, Teflon disks, a Teflon ruler (slope) and a | Noise and contrast transfer function resolution test chart

**EVALUATION PARAMETERS** 

## DESCRIPTIONS SET INCLUDES

1 phantom

1 storage case

## 41322-000 PH-10 X-ray **BMD Chart Phantom UHA** Bone Mineral Density chart for microdensitometry (MD) method SHOW MORE FEATURES **APPLICATIONS** 21 steps with different hydroxyapatite content | microdensitometry Steps range from 0 to 400 mg/cm, with 20mg/cm difference each

#### DESCRIPTIONS

SET INCLUDES 1 chart phantom 1 storage case

87

## PH-17 | 41317-000 Water Body Phantom WAC



#### Image evaluation in plain X-ray



- Rod 15: 41319-000 - Rod 10: 41319-010

#### DESCRIPTIONS

SIZE

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

g J

#### PH-39 41326-000 Dosimetry CT **Dynamic Thorax Phantom** Anthropomorphic chest phantom for respiratory gating SHOW MORE! FEATURES **APPLICATIONS** TLD can be inserted to simulate the nodule Respiratory gating CT Six preset respiratory patterns are prepared Dosimetry Respiratory patterns can be modified and saved Radiation therapy Up to three different respiratory patterns can be run in sequence **CONTROLLABLE PARAMETERS** DESCRIPTIONS SET INCLUDES Respiratory rate: 6-24 cycles/min. Movement of diaphragm: 0-38 mm/0-1.5 in 1 drive unit 1 diaphragm block set of simulated nodules chest phantom Linearly movement of nodule unit: 38mediastinum phantom 1 controller 64 mm/ 1.5-2.5 in with right pulmonary vessels storage case | Rotation of nodule unit: 50-70 degrees nodule rotation unit manual 41327-000 **PH-48** Dosimetry CT STORAC Dynamic Heart and Lung Phantom The motion of diaphragm and tumor, and the realistic heart motions provide various solutions for clinical research SHOW MORE FEATURES **APPLICATIONS** Respiratory gating chest CT The phantom represents movement of the heart, lungs and pulmonary nodule Tumor tracking in radiotherapy The pulmonary nodule and diaphragm move independently with the ECG gating cardiac CT

respiratory cycle Three dimensional movement of the pulmonary nodule (linearly and rotationally) -Motion disc represents respiratory movement of abdomen

The elastic heart represents systolic and diastolic motion

The coronary arteries including stenotic examples are shown -The phantom can be connected to ECG for ECG gating

#### ANATOMY

Synthetic bones of the chest Heart with coronary artery

| Diaphragm

#### DESCRIPTIONS

SET INCLUDES 1 drive unit

- nodule rotation unit 1 diaphragm block
- chest phantom
- 3 types of heart unit
- tablet PC
- manual
- 1 set of simulated tumors (15 types)
- 1 storage case

#### PATHOLOGY

Pulmonary nodule stenosis of coronary arteries

#### **CONTROLLABLE PARAMETERS**

Heart rate: 30-120 times/min Ejection volume: 60, 70, 80, 90, 100ml ef rate: 30%, 35%, 40%, 45%, 50%, 55%, 60% Respiratory rate: 6-24 cycles/min Linear movement of nodule unit: 8-64mm / 0-1.5 in Rotation range of nodule unit: 50-70 degrees

Kyoto Kagaku Product Lineup Web

Q

🕻 KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 40

## PH-40/41/42 Tough Phantom Series

Dosimetry

#### A stable, high quality and shatter-free phantom for radiotherapy

#### PH-40 Human tissue substitute phantoms with water equivalent physical properties Tough Water Phantom WD VARIATIONS SHOW MORE WD-3002 300 x 300 x 2 mm/ 12 x 12 x 0.08 in WD-4003 400 x 400 x 3 mm/ 16 x 16 x 0.12 in WD-3003 300 x 300 x 3 mm/ 12 x 12 x 0.12 in WD-4005 400 x 400 x 5 mm/ 16 x 16 x 0.2 in WD-3005 300 x 300 x 5 mm/ 12 x 12 x 0.2 in WD-4010 400 x 400 x 10 mm/ 16 x 16 x 0.4 in WD-3010 300 x 300 x 10 mm/ 12 x 12 x 0.4 in WD-4015 400 x 400 x 15 mm/ 16 x 16 x 0.6 in WD-3015 300 x 300 x 15 mm/ 12 x 12 x 0.6 in WD-4020 400 x 400 x 20 mm/ 16 x 16 x 0.8 in WD-3020 300 x 300 x 20 mm/ 12 x 12 x 0.8 in WD-4025 400 x 400 x 25 mm/ 16 x 16 x 1.0 in WD-3025 300 x 300 x 25 mm/ 12 x 12 x 1.0 in WD-4030 400 x 400 x 30 mm/ 16 x 16 x 1.2 in WD-3030 300 x 300 x 30 mm/ 12 x 12 x 1.2 in WD-4040 400 x 400 x 40 mm/ 16 x 16 x 1.6 in WD-3040 300 x 300 x 40 mm/ 12 x 12 x 1.6 in WD-4050 400 x 400 x 50 mm/ 16 x 16 x 2.0 in WD-3050 300 x 300 x 50 mm/ 12 x 12 x 2.0 in MATERIAL WD-4002 400 x 400 x 2 mm/ 16 x 16 x 0.08 in Epoxy resin PH-41 Human bone substitute phantoms to simulate body structure in combination with PH-40 and PH-42 Tough Bone Phantom BE-T, BE-H, BE-NWD VARIATIONS SHOW MORE BE-T-2005 Compact Bone 200x200x5mm/ 8x8x0.2 in BE-N-2020 Inner Bone 200x 200x 20 mm/ 8x 8x 0.8 in BE-T-2010 Compact Bone 200x200x10mm/ 8x8x0.4 in BE-H-3005 Cortical Bone 300x 300x 5 mm/ 12x 12x 0.2 in BE-T-2020 Compact Bone 200x200x20mm/ 8x8x 0.8 in BE-H-3010 CorticalBone 300x300x10mm/12x12x0.4 in BE-H-2005 Cortical Bone 200x200x5 mm/ 8x8x0.2 in BE-H-3020 CorticalBone 300x 300x 20 mm/ 12x 12x 0.8 in BE-H-2010 Cortical Bone 200x200x10mm/ 8x8x0.4 in BE-N-3005 Inner Bone 300 x 300 x 5 mm / 12 x 12 x 0.2 in BE-H-2020 Cortical Bone 200x200x20mm / 8x8x0.8 in BE-N-3010 InnerBone 300x300x10mm/12x12x0.4in BE-N-2005 Inner Bone 200x200x5 mm/ 8x8x0.2 in BE-N-3020 InnerBone300x300x20mm/12x12x0.8in BE-N-2010 Inner Bone 200x200x10 mm/ 8x8x0.4 in MATERIAL Epoxy resin PH-42 Human lung substitute phantoms to simulate body structure in combination with PH-40 and PH-41 Tough Lung Phantom LP VARIATIONS SHOW MORE LP-3010 300 x 300 x 10 mm / 12 x 12 x 0.4 in LP-3020 300 x 300 x 20 mm / 12 x 12 x 0.8 in LP-3030 300 x 300 x 30 mm / 12 x 12 x 1.2 in LP-3050 300 x 300 x 50 mm / 12 x 12 x 2.0 in MATERIAL Phenolic resin **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 Specify your chamber's 1. Sandwich type (for pencil type) manufacturer and model 2. Cylinder hole type (for pencil type) number 3. Shallow type (for plain parallel type)

🕻 KYOTO KAGAKU 🥎 KYOTOKAGAKU AMERICA INC. 41



Q

Kyoto Kagaku Product Lineup Web

## Phantoms for therapeutic energy range

-										
Comparison of Physical Prope	omparison of Physical Properties ICRU publication 23 (Reference man									
		humar	n soft tissue	muscle	fat		cartilage	lung		
electron density (x10 <sup>23</sup> 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		0.95		1.10	0.26			
	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 (x10 <sup>23</sup> 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
Н	8.63	3.69	5.11	Т	6.97	7.00
C	68.89	29.22	42.45		60.03	50.20
N	2.18	1.19	1.73	Τ	2.45	-
0	17.88	32.66	28.13	Τ	21.79	35.10
P	_	10.24	7.00		2.30	0.10
CI	0.15	0.06	0.09		0.13	1.00
Ca	2.27	22.92	15.49		6.33	-
AI	-	-	-	Т	-	1.50
Si	_	_	-		—	5.00

2

PH-37   41480-000 Therapy Body Phantom THRA-1	Dosimetry STORAGE
THRA-1 is an anthropomorphic, cross	sectional dosimetry for therapeutic energy range
SHOW MORE!	FEATURES I 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
DESCRIPTIONS	
SET INCLUDES         1       phantom       1       storage case         1       supporting frame       manual         insert rods for dosimeter holes       manual	MATERIALS Body: Tough Water WE-211 (epoxy resin) Bone: Tough Bone BE-303 Lung: Tough Lung LP-430
SPECIFICATIONSPhantom height:Phantom weight:Slice thickness:80 cm / 31.6 in33 kg / 72.7 lb3 cm / 1.2 in	Dosimeter holes: in lattice-like pattern of 3 x 3 cm / 1.2 x 1.2 in
PH-38   41480-010 Pediatric Therapy Body Phantom	THRA-2
SHOW MORE!	FEATURES I 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
DESCRIPTIONS	
SET INCLUDES         1       phantom         1       supporting frame         insert rods for dosimeter holes         SPECIFICATIONS         Phantom height:         60 cm / 23.6 in	MATERIALS Body: Tough Water WE-211 (epoxy resin) Bone: Tough Bone BE-303 Lung: Tough Lung LP-430
KYOTO KAGAKU 🥎 KYOTOKAGAKU AMERICA IN	C. 42 Kyoto Kagaku Product Lineup Web

## PH-31/41330-000 PH-32B/41330-030 MRI Quality Assurance Phantom MHR/ JMR II



This QA phantom for MRI allows to evaluate the slice thickness, spatial resolution, uniformity and geometric distortion as well as contrast

#### PH-31 MHR: compiled with NEMA standards



#### FEATURES

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

1 funnel

petroleum jelly

screwdriver

1 storage case

manual

extra screws

#### **EVALUATION PARAMETERS**

#### PH-31 MHR

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

#### PH-32B JMR 2

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

**APPLICATIONS** 

#### DESCRIPTIONS

#### PH-31 MHR

#### SET INCLUDES

- 1 phantom unit A
- phantom unit B 1 liquid paraffin
- spout 1
- NiCl 50ml (5, 10, 15, 20, 25 mmol) sample bottle (13,5ml)

#### MATERIALS

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

#### **SPECIFICATIONS**

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

#### PH-32B JMR 2

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

#### MATERIALS

Acrylic resin, MRI solution:

#### SPECIFICATIONS

Dimensions: 18 dia. X 13(H) cm 7.1dia. x 5.1 in

KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 43 8/1

1 funnel petroleum jelly

1 screwdriver

1 storage case

manual

extra screws

#### MRI -Quality Assurance-

#### PH-72 41936-000 MRI Breast QA phantom



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



#### **FEATURES**

#### **APPLICATIONS**

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

## DESCRIPTIONS

adjustment bolts

supporting plate

#### SET INCLUDES

1 storage case

each)

1

1

2 breast MRI evaluation unit (2 types, 1

#### MATERIALS Acrylic resin

#### SPECIFICATIONS

Phantom dimensions: 30 x 40 x 26 cm, 5kg 11.8 x 15.7 x 10.2 in, 11 lb

## **TEST SUMMARY**

MRI

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





# SET INCLUDES 1 head phantom

- simulated tumor
- 1 nickel chloride solution
- storage case SPECIFICATIONS
- Phantom height: 33 cm/ 12.9 in





**Nuclear Medicine** 

#### PH-64 41928-000 **PET/ SPECT Brain Phantom**

Nuclear MRI

Nucleus and	the caudate nucleus for	I-123 DatSCA	N		_
	47	<b>P</b> 1	47	SHOW MORE!	
FEATURES			APPLIC	ATIONS	
Anthropomorphic head phantom simulates characteristics of head and skull RI solution can be injected to striatum and	the absorption and sca putamen	tter	SPECT   DatSCA	٨N	
				Volumo	

ANATOMY 1038.90 ml Cerebrum 5.46 ml Brain ventricle Putamen Putamen (right) 6.7 ml Putamen (left) Striatum Cerebrum Caudate nucleus (right) 5.38 ml Caudate nucleus Skull Caudate nucleus (left) 5.09 ml

#### DESCRIPTIONS

#### SET INCLUDES

A

- 1 head phantom (separated at the top) brain container 1
- 1 storage case manual

PH-27

#### MATERIALS Striatum case: epoxy resin Brain ventricle: polyurethane Brain case: polyurethane Artificial bone: epoxy resin Soft tissue: polyurethane

SHOW MORE

SHOW MORE

#### SPECIFICATIONS Phantom size: W20 x D21 x H33 cm W7.8 x D8.2 x H13 in Phantom weight: 5.5 kg / 12.1 lb

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

41530-000

**Brain Phantom IB-10** 

## **APPLICATIONS**

SPECT, PET

EVALUATION PARAMETERS: common with IB-20

#### DESCRIPTIONS

SET INCLUDES

- 2 bone scatterer cases adult male: equivalent HU750
- elderly female: equivalent HU530
  - brain striatum phantom

## 1 screwdriver

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

## **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 ( IB-10 set only) Radioactive concentration and linearity of SPECT value (IB-10 set only)

DESCRIPTIONS

#### SET INCLUDES

- 1 brain unit
- skull container unit 1 1 J-Jack phantom
- section phantom
- MATERIALS Acrylic resin/ urethane resin

## **SPECIFICATIONS**

1 velcro tape

1 storage case

manual

MATERIALS

1

petroleum jelly

Brain striatum: epoxy resin

Brain striatum container: urethane resin

Cerebral ventricle: urethane resin

Brain stratum phantom cover: acrylic Bone scatterer case: epoxy resin

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

KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 45 § 1

Kyoto Kagaku Product Lineup Web Q

PH-65 41929-000		Nuclear STURAGE	
PET/SPECT Thyroid Phantom AT			LCASE
Five kinds of thyroid with different c	apacities for uptal	king rate measurem	nent
			SHOW MORE!
FEATURES		APPLICATIONS	
Anthropomorphic thyroid phantom simulates the abso scatter characteristics of human neck area that surrou For quality assurance of system for iodine uptake rationatten attenuation, and sensitivity	orption and unds thyroid o test; scatter,	SPECT, PET	
ANATOMY		Thyroid 1	14.7 ml
Cervical spine C3 to C7Breastbone (half)Thoracic spine T1Thyroid (5 variations)Clavicle		Thyroid 2 Thyroid 3 Thyroid 4 Thyroid 5	16.7 ml 20.7 ml 30.2 ml 39.0 ml
DESCRIPTIONS			
SET INCLUDES       MATERIALS       Sc         1       neck and upper chest phantom       1       storage case       Th         5       neck cover for thyroid       1       manual       Th         5       thyroid containers       Br	oft tissue: urethane based ru nthetic bone: epoxy resin hyroid: acrylic resin hyroid container: urethane b ronchus: acrylic resin	based resin SPECIFICATION phantom size W40 x D18 3 W15.7 x D7	lS e: phantom weight: x H16 cm 4kg x H6.3 in 8.8 lb
PH-69 41930-000 Thyroid Phantom UN			Nuclear Medicine STORAGE LASE
Five kinds of thyroid volume co	ntainers for meası	irement purposes	
			SHOW MORE!
FEATURES		APPLICATIONS	
5 kinds of thyroid grand (40,30,21,17,15 cc) Synthetic cervical vertebrae as a scatteration Infusing radiopharmaceuticals		SPECT, PET	
Cervical vertebrae from C3 to C7			
DESCRIPTIONS			
SET INCLUDES     1     cervical spine       1     outer phantom     1     trachea tube       5     thyroid containers     1     storage case       1     thyroid (cold spot)     manual	MATERIALS Container: acrylic resin Synthetic bone: epoxy res Thyroid: acrylic resin	sin SPECIFICATION phantom size 13 dia. x H11 5.1 dia. x H4.	s e: phantom weight: .6 cm 0.85 kg 6 in 1.87 lb

Kyoto Kagaku Product Lineup Web

Q

Nuclear Medicine



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





STORAGE CASE

## **APPLICATIONS**

SPECT

1

## DESCRIPTIONS SET INCLUDES

petroleum jelly

screwdriver

1 storage case

manual

- MATERIALS Acrylic resin **SPECIFICATIONS** 
  - Phantom size:
  - 12.5 dia. x 12.5 (H) cm/4.9dia. x 4.9(H) in



#### PH-24 41333-000 Myocardial Phantom HL

For the study of high radio accumulation interference in the liver with the myocardial SPECT images









#### FEATURES

Background can be set individually in lung field, mediastinum and right ventricle

**APPLICATIONS** 

| SPECT

Allows the study of RI liver intake and its effect on the myocardial SPECT Cold defect can be set in the left cardiac muscle

### DESCRIPTIONS

- SET INCLUDES
- 1 main phantom body 1 stomach
- right lung
- left lung 1
- mediastinum
- liver
- 1 work base
  - screwdriver 1 petroleum jelly 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

#### **SPECIFICATIONS** Phantom size:

W32 x D22 x H31 cm / W12.5 x D8.6 x H12.2 in Phantom weight: 7.1 kg / 15.6 lb Packing size: W44 x D39 x H42 cm W17.3 x D15.3 x H16.5 in Packing weight: 12.5 kg / 27.5 lb



Volumetric measurement phantom for PET/SPECT

heart

## FEATURES

SET INCLUDES

1 phantom storage case

1

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% **APPLICATIONS** SHOW MORE SPECT, PET DESCRIPTIONS



**SPECIFICATIONS** 

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

KYOTO KAGAKU 🔿 KYOTOKAGAKU AMERICA INC. 47

# PRODUCT CATALOG Vol.RP-1a

			storage case	
PH-1	41337-000	Multipurpose Chest Phantom N1 "LUNGMAN"		15
	41337-020-	Components for Radioisotope Optional Parts for PH-1		16
PH-1c	41337-400	Pediatric Chest Phantom	$\checkmark$	17
PH-2	41350-000	Whole Body Phantom PBU-50		10
PH-2B	41350-200	Whole Body Phantom PBU-60		8
PH-2C	41350-300	Pediatric Whole Body Phantom "PBU-70"		6
PH-2D	41350-500	Bone Fracture Pediatric Phantom "PBU-70B"		7
PH-2E	41350-700	CT Whole Body Phantom with Pathologies		9
	41350-200-16	Body plates to simulate a body of BMI 32 Optional Parts for PH-2/2B/2E/	60	12
	41350-200-17	Body plates to simulate a body of BMI 40 Optional Parts for PH-2/2B/2E/	60	12
	41350-000-11	Fractured Hand/Forearm Phantom PH-2/2B Optional Parts for PH-2/2B/2E/	60	12
	41363-070	Storage case 2 (a pair) Optional Parts for PH-2/2B/2E/	60	12
PH-3	41309-100	Angiographic CT Head Phantom ACS for CT	$\checkmark$	21
	41309-200	Angiographic CT Head Phantom ACS for Angio	$\checkmark$	21
	41309-300	Angiographic CT Head Phantom ACS for MECT	$\checkmark$	21
PH-4	41324-040	CT Torso Phantom CTU-41	$\checkmark$	20
PH-5	41360-000	CT Abdomen Phantom for CT	$\checkmark$	23
	41360-100	CT Abdomen Phantom for MECT	$\checkmark$	23
PH-6B	41310-020	Dynamic Cardiac CT Phantom MD-CT	$\checkmark$	37
PH-7	41339-010-	CT-AEC Phantoms		36
PH-8	41507-000	Lung Cancer Screening Phantom LSCT001		19
PH-9	41334-000	Multi Slice CT Phantom MHT	$\checkmark$	35
PH-9-2	41334-120	Ladder Phantom	$\checkmark$	37
PH-10	41322-000	BMD Chart Phantom UHA	$\sim$	38
PH-13	41329-010	Digital Mammographic Phantom NCCE	$\sim$	38
PH-14	41430-000-	Acrylic Phantom XAC	$\checkmark$	39
PH-16	41318-000-	Contrast Detail Phantom	$\checkmark$	39
PH-17	41317-000	Water Body Phantom WAC	$\checkmark$	39
PH-18	41311-000	Stomach Phantom BMU-1	$\sim$	24
PH-19	41312-010	Rotation Stomach Phantom TMP-R	$\sim$	24
PH-24	41333-000	Myocardial Phantom HL	$\sim$	47
PH-26	41503-000	ORINS Thyroid Phantom ITS	$\checkmark$	47
PH-27	41530-000	Brain Phantom IB-10		45
PH-28	41535-000	SPECT QA Phantom JSP	$\checkmark$	48

			case	
	41535-010	Holder and accessories Optional Parts for PH-28 and 30		48
PH-29	41540-030	ECT Hot Cold Phantom SP-6	$\checkmark$	47
PH-31	41330-000	MRI Quality Assurance Phantom MHR	$\checkmark$	43
PH-32B	41330-030	MRI Quality Assurance Phantom JMR II	$\checkmark$	43
PH-33	41330-010	MRI Head Phantom NH	$\checkmark$	44
PH-34	41501-000	MRI/NM Head Phantom BHC	$\checkmark$	44
PH-37	41480-000	Therapy Body Phantom THRA-1	$\checkmark$	42
PH-38	41480-010	Pediatric Therapy Body Phantom THRA-2	$\checkmark$	42
PH-39	41326-000	Dynamic Thorax Phantom	$\checkmark$	40
PH-40	WD-3002-	Tough Water Phantom WD	$\checkmark$	41
PH-41	BE-T-2005-	Tough Bone Phantom BE-T, BE-H,BE-NWD	$\checkmark$	41
PH-42	LP-3010-	Tough Lung Phantom LP	$\checkmark$	41
PH-46	41362-000	CT Prostate Phantom	$\checkmark$	25
PH-47	41301-200	Dental Radiology Head Phantom (Mouth Closed)	$\checkmark$	22
PH-48	41327-000	Dynamic Heart and Lung Phantom	$\checkmark$	40
PH-49	41910-000	CT Colonography Phantom NCCS	$\checkmark$	26
PH-50	41912-000	Newborn Whole Body Phantom	$\checkmark$	5
PH-50B	41912-100	Newborn Whole Body Phantom PBU-80	$\checkmark$	5
PH-51	41913-000	Lumbar Spine Fluoroscopy Training Phantom	$\checkmark$	27
PH-53	41918-000	Brain Phantom IB-20 advanced	$\checkmark$	45
PH-54	41919-000	CT QA Phantom JCT I	$\checkmark$	34
PH-55	41920-000-	CT ERF Phantom HIT	$\checkmark$	32
PH-56	41921-000	Tomosynthesis Phantom NS		33
PH-58	41923-000-	Subsolid Nodules Phantom Optional Parts for PH-1	$\checkmark$	34
PH-59	41924-000	CT-DI Phantom (Head and Body Phantom)	$\checkmark$	16
PH-60	41925-000	Tough Whole Body Phantom "PBU-90 RUGGED"	$\checkmark$	34
PH-61	41926-000-	Sectional Phantom Series	$\checkmark$	11
PH-63	41927-000	PET/SPECT Thorax Phantom		13
PH-64	41928-000	PET/SPECT Brain Phantom		18
PH-65	41929-000	PET/SPECT Thyroid Phantom -Anthropomorphic Type-		45
PH-69	41930-000	Thyroid Phantom UN	$\checkmark$	46
PH-71	41935-000	Knee Ligament Phantom	$\checkmark$	46
PH-72	41936-000	Breast MRI QA phantom	$\checkmark$	25
PH-74	41938-000	Bone Scintigraphy Quality Assurance Phantom	$\checkmark$	44
PH-75A	41941-000	Multi Energy CT Quality Assurance Phantom (TR-J)	$\checkmark$	31
PH-75B	41941-100	Multi Energy CT Quality Assurance Phantom (TR-I)		30
PH-76	41301-500	Dental Radiography Phantom		30
				22

storage

## **70th Anniversary**

Thanks to the support of our customer and stakeholders, on June 8, 2018, we are celebrating our 70th anniversary. We would like to express our deepest gratitude to all of you who have supported us throughout these years.

Formerly known as "the specimen's division" of Shimadzu Corporation, Kyoto Kagaku was founded on June 8, 1948.

In line with our company philosophy, "We, Kyoto Kagaku, aim to be as one with our community.", we have contributed to our community through education, culture and welfare. Now in the wake of medical advancement, our activities are widely involved in the field of medical, nursing, welfare education to support healthcare professionals throughout the world.

Upon the occasion of our 70th anniversary, we wish to advance toward the world to achieve further growth and prosperity. We intend to preserve the important tradition built by our predecessors, develop our strengths, respond to the changes of the times and create a foundation for new growth.

We sincerely wish you all your continued guidance and encouragement in the future.

1st June. 2018 Tamotsu Katayama President Kyoto Kagaku Co., Ltd

1. Waturs

Sincerely,

## **OFFICES**



#### Kyoto Kagaku Co., Ltd Head Office and Factories

15 Kitanekoya-cho, Fushimi-ku, Kyoto, 612-8388, Japan

Kyoto Kagaku Co., Ltd Tokyo Branch

Second fl. NREG Hongo-3-chome bldg., 3-26-6 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan

Kyoto Kagaku Co., Ltd Nagoya Branch

3rd Gojinsha Meieki3 bldg., 9-37 Meieki-3-chome, Nishi-ku, Nagoya City, Aichi 451-0045, Japan

#### Kyoto Kagaku Co., Ltd Sendai Branch

6th. Taiyoseimei Sendaihoncho bldg., 4-18 Honcho-3-chome, Aoba-ku, Sendai City, Miyagi 980-0014, Japan



Kyoto Kagaku Co., Ltd. Hong Kong Representative Office

Level 60, One Island East, 18 Westlands Road, Island East, Hong Kong



Kyoto Kagaku Co., Ltd. European Representative Office

De-Saint-Exupery-Str.10, 60549 Frankfurt, Germany



Kyoto Kagaku America Inc.

3109 Lomita Boulevard, Torrance, CA 90505-5108, USA

## PRODUCT LINEUP WEB

Announcing our new mobile-friendly website, containing downloadable product descriptions on over 100 items.

Browse through our lineup of Kyoto Kagaku simulators and phantoms. All are made in Kyoto.



lineup kyoto kagaku



https://www.kyotokagaku.com/lineup/index.html



Follow us on our Facebook

## You Tube

Follow us on our YouTube Channnel https://www.youtube.com/user/KyotoKagaku

## Kyoto Kagaku 💻 NEWS

Discover latest on simulation in healthcare, hands-on skills training, medical imaging phantoms!

↓↓ Send us an e-mail to↓↓ where to subscribe.

# KYOTO KAGAKU co..LTD thttp://www.kyotokagaku.com rw-kyoto@kyotokagaku.co.jp

Worldwide Inquires and Ordering Head Office and Factories

15 Kitanekoya-cho, Fushimi-ku, Kyoto, 612-8388, Japan

♦ +81-75-605-2510
♦ +81-75-605-2519

Kyoto Kagaku Co., Ltd. Hong Kong Representative Office

Level 60, One Island East, 18 Westlands Road, Island East, Hong Kong

🕲 +852-3978-1365 🛛 🖶 +852-3978-1199

Kyoto Kagaku Co., Ltd. European Representative Office

De-Saint-Exupery-Str.10, 60549 Frankfurt, Germany ♥ +49-69-5060-28160 ➡ +49-69-5060-28170 All American regions KYOTOKAGAKU AMERICA INC.

http://www.kkamerica-inc.com/

🔀 info@kkamerica-inc.com

3109 Lomita Boulevard, Torrance, CA 90505-5108, USA

♥ +1-310-325-8860
➡ +1-310-325-8867