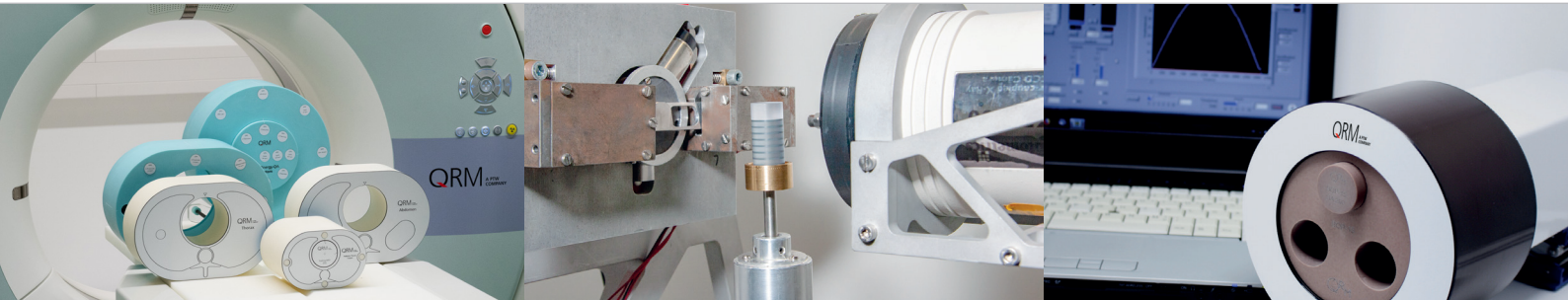


# QRM Product Highlights



Phantoms for your needs.



QRM  
A PFW  
Company  
Thorax

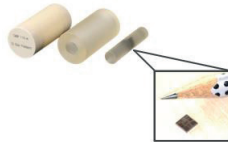
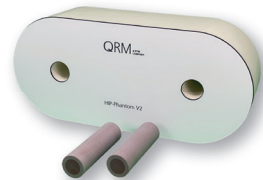
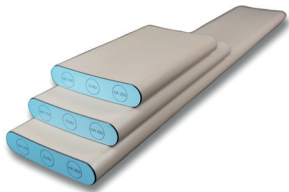
qrm.de

# QRM - A PTW Company

A milestone in the history of both companies



- In 1922, PTW started being a pioneer in medical radiation measurements. Since then, PTW has always been and will continue to be at the forefront of advancing patient safety through innovation and cutting-edge measurement technology.
- In 1994, QRM (Quality Assurance in Radiology and Medicine) was founded by Professor Willi A. Kalender as a university spin-off of the Institute of Medical Physics in Erlangen, Germany, for the development, design, construction, and production of phantoms for quality assurance in X-ray imaging and associated procedures.
- Since April 2020 QRM is a subsidiary of PTW-Freiburg.



**Image Quality**

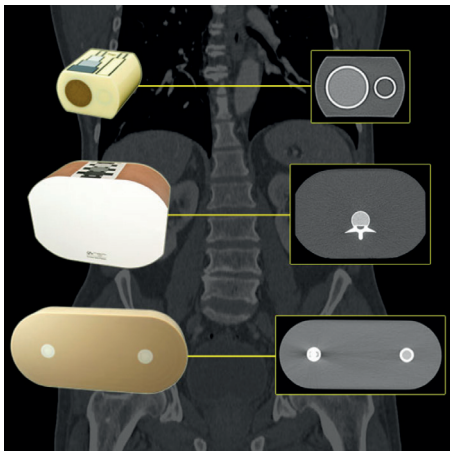
**Bone Densitometry**

**Micro-CT**

**Customized solutions**

# Phantoms for your needs.

Powerful expertise in quality assurance



- Dedicated phantom solutions for diagnostic radiology, radiotherapy, bone densitometry (DXA and qCT), Micro-CT / Micro-PET for small animal research, Cone-Beam CT and many other applications
- Tissue-equivalent materials (TEM) mimic human tissues according to ICRU Reports 44 and 46
- Unique solutions: Micro-CT Bar Pattern Phantom
- Customized solutions according to your specification

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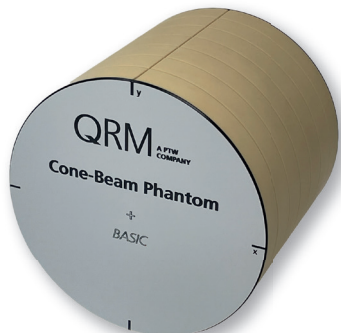
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REF: QRM-10108  
S/N: DTI-106

Adipose Tissue

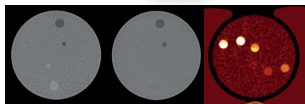
# Image Quality Phantoms

Convenient testing of all relevant imaging parameters

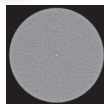


## Cone-Beam Phantom

- Complete solution for the imaging performance of computed tomography (CT), and Cone-Beam CT
- Suitable to evaluate image quality parameters
  - CT value uniformity
  - CT value accuracy
  - Image noise
  - Contrast-to-noise ratio (CNR)
  - Spatial resolution (ESF, MTF, wedges)
  - Spatial resolution (visual, line pattern)
  - Geometric accuracy in-plane
  - Low-contrast capabilities



**Dual Energy Phantom**



**Wire MTF Phantom**



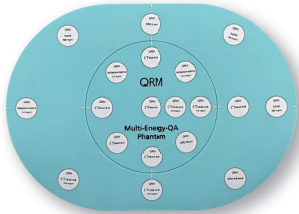
**Cardio Calcium Scoring Phantom**

Application	Dual-energy performance test	To assess in-plane spatial resolution of any X-ray imaging in 3D direction	To investigate the influence of scan parameters on the detectability of calcifications
Inserts	Several inserts with different CaHA and iodine concentrations	50 micron tungsten wire	9 inserts with different CaHA concentrations and sizes
Diameter	100 mm	60 mm (standard) 100 mm (with D100)	100 mm (insert size)
Base material	Water-equivalent	Resin or air	Tissue-equivalent (resin)



# Image Quality Phantoms

Convenient testing of imaging parameters



## Multi Energy QA Phantom

- Suitable for Photon counting CT protocols in addition to all available spectral CT protocols
- 26 inserts including rods enriched with several contrast media (water+iodine, adipose+iodine) as well as calcium (water+calcium hydroxyapatite), each material with different concentrations
- Automated analysis software

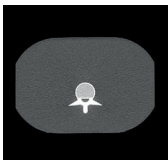
## Spectral CT Phantom

- Test different types of computed tomography (CT) scanners with dual-energy, multi-energy or photon-counting protocols and post-processing techniques in terms of accuracy and consistency
- Different solid rods: Iodine, calcium, water and soft tissue-equivalent materials such as adipose, muscle, liver and lung



# Bone Densitometry Phantoms

Evaluation of the bone mineral density by DXA and qCT



## European Spine Phantom

- To evaluate bone mineral density
- For cross-calibration of CT and DXA
- For DXA (dual-energy x-ray absorptiometry) and qCT (quantitative computed tomography)
- Three vertebrae (L1/L2/L3) with different dimensions and bone mineral content

## Bone Density Calibration Phantom

- HU vs. CaHA calibration with respect to bone mineral density evaluation of bones
- Several options with different lengths and HA inserts
- Easy to use as placed directly under an object



# Micro-CT Phantoms

Evaluate a wide range of image quality parameters



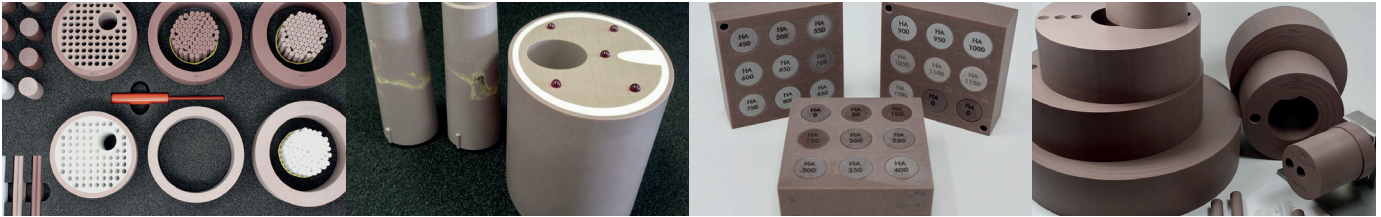
## Micro-CT HA Phantom

- Worldwide standard for measuring small animal Micro-CT bone mineral density
- 5 different inserts with various CaHA densities (0, 50, 200, 800, and 1200 mg HA/cm<sup>3</sup>)
- Available diameters 4.5/10/20/25/32 mm

## Micro-CT Bar Pattern Nano Phantom

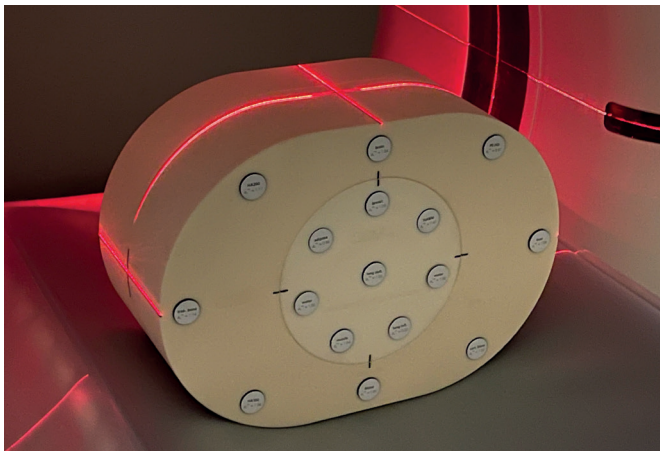
- For the evaluation of in-plane and axial high spatial resolution down to 1 micron
- Center and corner sections providing several bars and point patterns between 1-10 micron
- Chip with 2 actinomorphous stars

Customized phantoms for your needs.



# Radiation Therapy Solutions

Calibration of radiation oncology treatment plans  
in research studies and experimental setups



## Comprehensive Electron Density Phantom

- To create electron density calibration curve of computed tomography (CT) scanners for treatment planning systems (TPS) in research studies and experimental setups
- Suitable for electron, photon, and proton therapy systems
- Available materials: 8 body and 8 head inserts
- Tissue equivalent materials: Muscle, adipose, liver, blood, brain, bone, cortical bone, lung, breast, polyethylene
- Optional titanium, stainless steel, or aluminum inserts
- Calibration certificate with densities, electron density and effective Z



## **QRM**

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