

# ConeBeam Phantom (Basic)

**The ConeBeam-Phantom is the most suitable tool to evaluate the imaging performance of computed-tomography (CT), cone-beam and flat-panel CT scanners.**

The ConeBeam Phantom was designed to cover the whole range of image quality achievable with this type of imaging equipment.

The phantom offers the possibility to assess image quality metrics in accordance with national and international standards (e.g. DIN IEC 61223-3-5 or DIN IEC 61223-2-6). The following image quality metrics can be obtained:

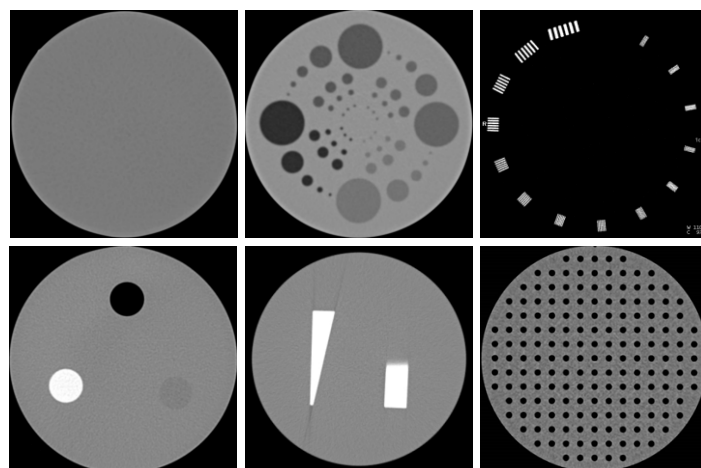
- CT value uniformity
- CT value accuracy
- image noise
- contrast-to-noise ratio
- spatial resolution (ESF, MTF, wedges)
- spatial resolution (visual, bar pattern)
- geometric accuracy in-plane
- low-contrast capabilities

The ConeBeam Phantom is essential to fully quantify the imaging performance of volumetric X-ray scanners and to compare different systems or technical solutions.

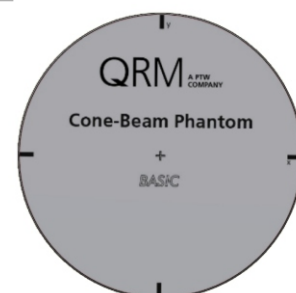
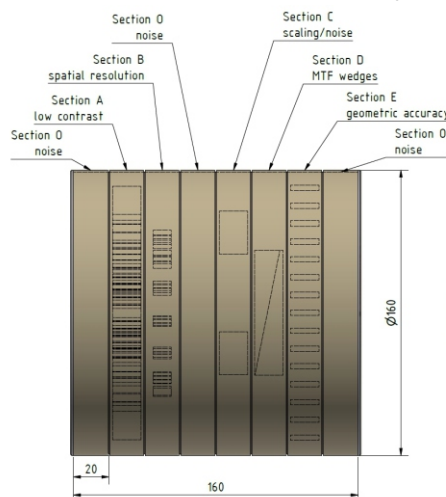
In addition to the overall image quality of cone-beam scanners, the associated dose should be measured using CT dosimetry phantoms (please see our dose phantoms on [www.qrm.de](http://www.qrm.de)). The CT Dose Index (CTDI) methodology can be applied to all types of cone-beam scanners.



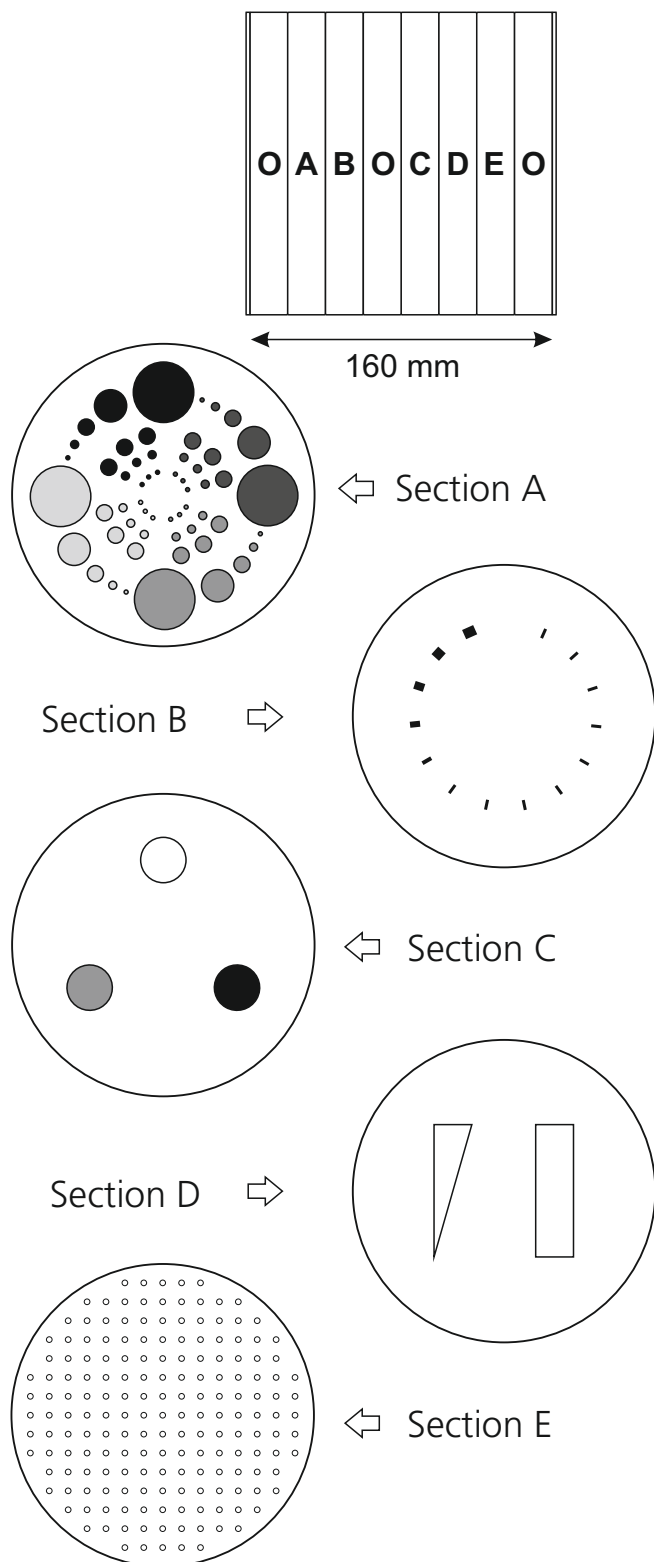
*The QRM-ConeBeam-Phantom*



*Axial CT-images of the different sections of the ConeBeam phantom*



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## Specifications

Diameter (xy): ..... 160 mm  
 Height (z): ..... 160 mm  
 Section height: ..... 20 mm  
 Phantom body: ..... tissue equivalent (at 120 kVp)

The phantom body comprises 5 sections:

### Section O - Plain

Blank section to measure homogeneity and noise.

### Section A - Contrast resolution

contrast steps -3, -5, -10, -20 HU  
 Inserts diameter in steps of 2, 4, 8, 16 and 32 mm respectively.

### Section B - Spatial resolution

14 circular aligned line patterns varying from 4 to 30 lp / cm

### Section C - Scaling & noise

3 inserts (D = 24 mm) providing bone equivalent material (400 mg CaHA / ccm), water equivalent (CTWater<sup>®</sup>) and air.

### Section D - MTF edges

Two PTFE wedges perpendicularly aligned for evaluating the MTF in different orientations.

### Section E - Geometric distortion

Hole grid, consisting of 177 holes (D=3mm) to measure the geometric distortion in the image

### Section O - Plain

Measure noise and homogeneity, optional space for custom-made adapter for individual mounting

**References:** [1] Gupta R, Grasruck M, Suess C, et al.

Ultra-high resolution flat-panel volume CT: fundamental principles, design architecture, and system characterization. Eur Radiol. 2006;16:1191–205.