

Dual Energy Phantom V2

The phantom is specially designed for dual energy (DE) purposes and can be used for quality assurance, scanner performance and evaluation of different DE post-processing techniques.

Research in computed tomography is currently focused on using dual energy to distinguish between different tissues on CT images.

The DEP-V2 is the first phantom providing the opportunity to test CT-scanner performance and to evaluate different DE post processing techniques.

Therefore the phantom provides different virtual non-contrast lesions.

The different cylindrical lesions consists of Ca^{++} or iodine. For example, in the CT-images some lesion's CT-values (HU) can be detected as equal to the surrounding material at one energy (e.g. 120 kV) and with a contrast at other energies (e.g. 80/140 kV).

The DEP-V2 fits to our additionally available thorax phantom. Extension rings, to simulate obese patients are available, as well.

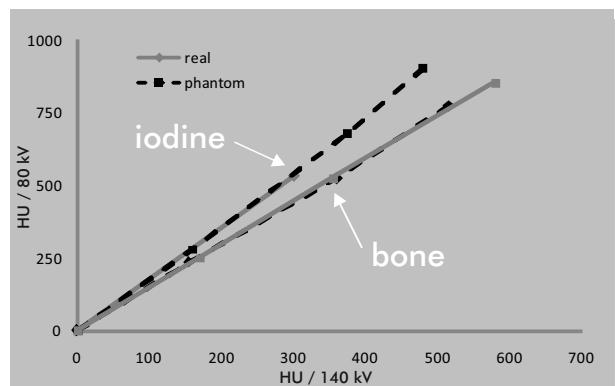
Specifications

Phantom diameter 100 mm
 Phantom length 100 mm
 Phantom weight 0.9 kg

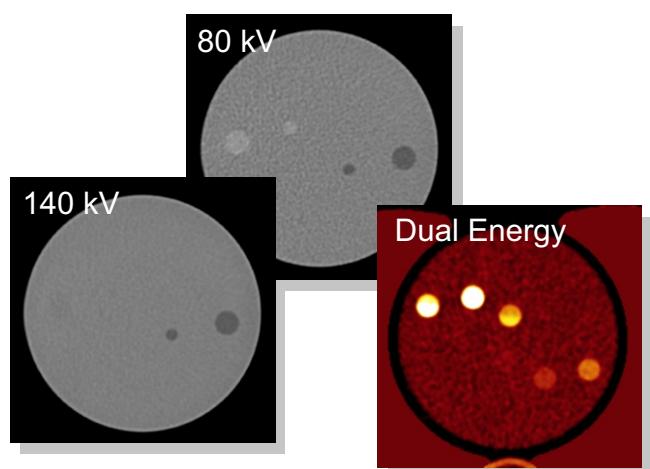
Material CTWater® (0 HU @ 80 - 120 kV)
 CTIodine® (solid iodine)
 CaHA (Ca^{++})



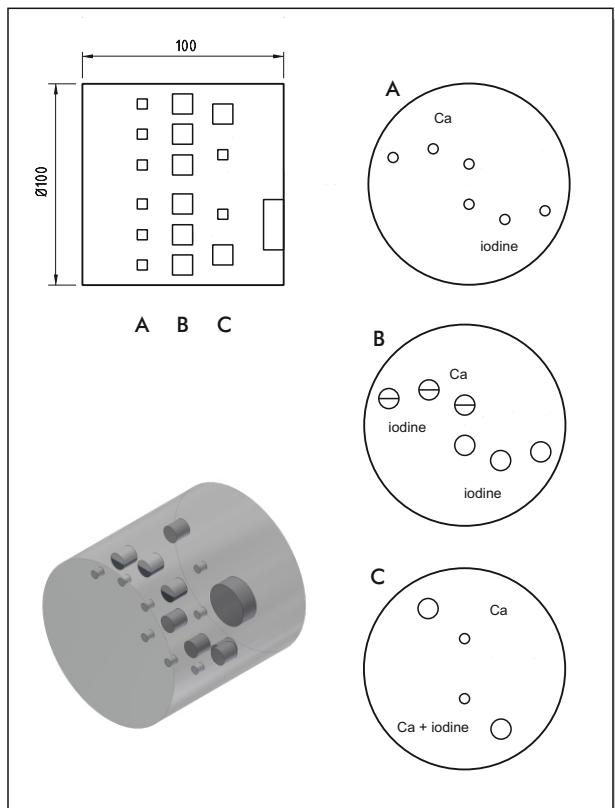
Dual Energy Phantom with additionally available QRM-Thorax



The graph shows the excellent correlation [1] between real and phantom material.



Dual Energy Phantom



Schematic view of the DE-Phantom V2

Specifications of lesions

Dimensions of the cylindrical inserts:

- 8 lesions 10 x 10 mm
- 8 lesions 5 x 5 mm
- 1 calibration cylinder ... 25 x 10 mm

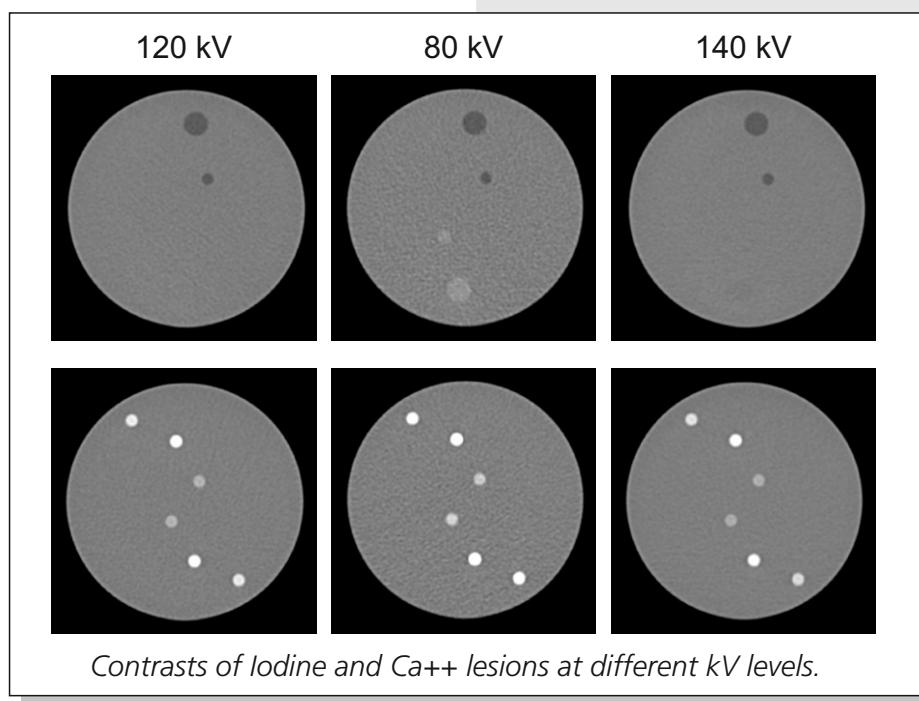
CT-values (HU) valid for 120 kV (± 5 HU)*:

Phantom body 0 HU at 80 - 140 kV

- | | | |
|----------|---------------------------|--------------------------|
| Layer A: | Ca ⁺⁺ | (200 HU, 400 HU, 590 HU) |
| | Iodine | (200 HU, 400 HU, 590 HU) |
| Layer B: | Half cylinder: | |
| | Ca ⁺⁺ | (200 HU, 400 HU, 590 HU) |
| | Iodine | (200 HU, 400 HU, 590 HU) |
| | Full cylinder: | |
| | Iodine | (25 HU, 50 HU, 100 HU) |
| Layer C: | Ca ⁺⁺ | (-140 HU, -140 HU) |
| | Ca ⁺⁺ + Iodine | (0 HU, 0 HU) |

Calibration cylinder (0 HU at 80 - 140 kV)

*specified values. Eff. values can vary due to manufacturing method and imaging device!



- References:** [1] Schmidt B, Sedlmair M, et al. Assessment of a Quality Assurance Phantom for Dual Energy CT. 2009, in Proceedings of Radiological Society of North America (RSNA) 95th Scientific Assembly and Annual Meeting, Chicago.