

# Collaboration & bespoke phantoms

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**Leeds Test Objects**  
medical imaging phantoms



# Introduction

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## Product design

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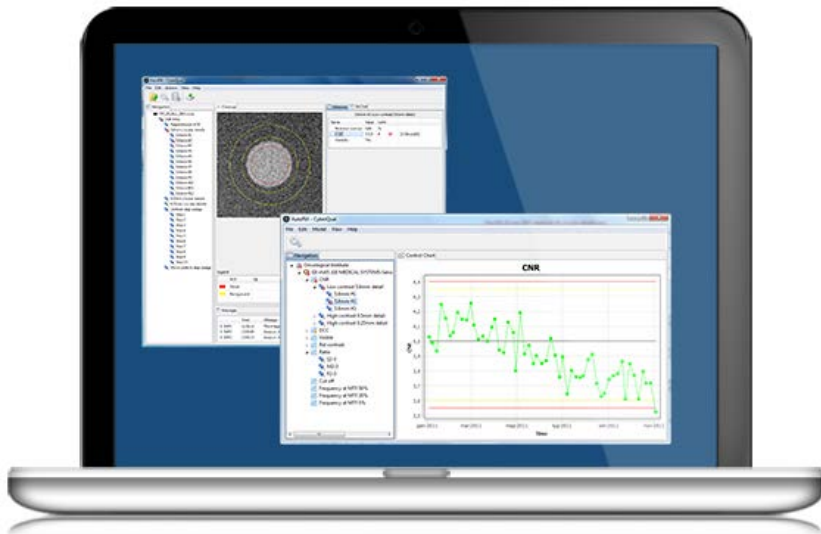
## Bespoke phantoms

# INTRODUCTION





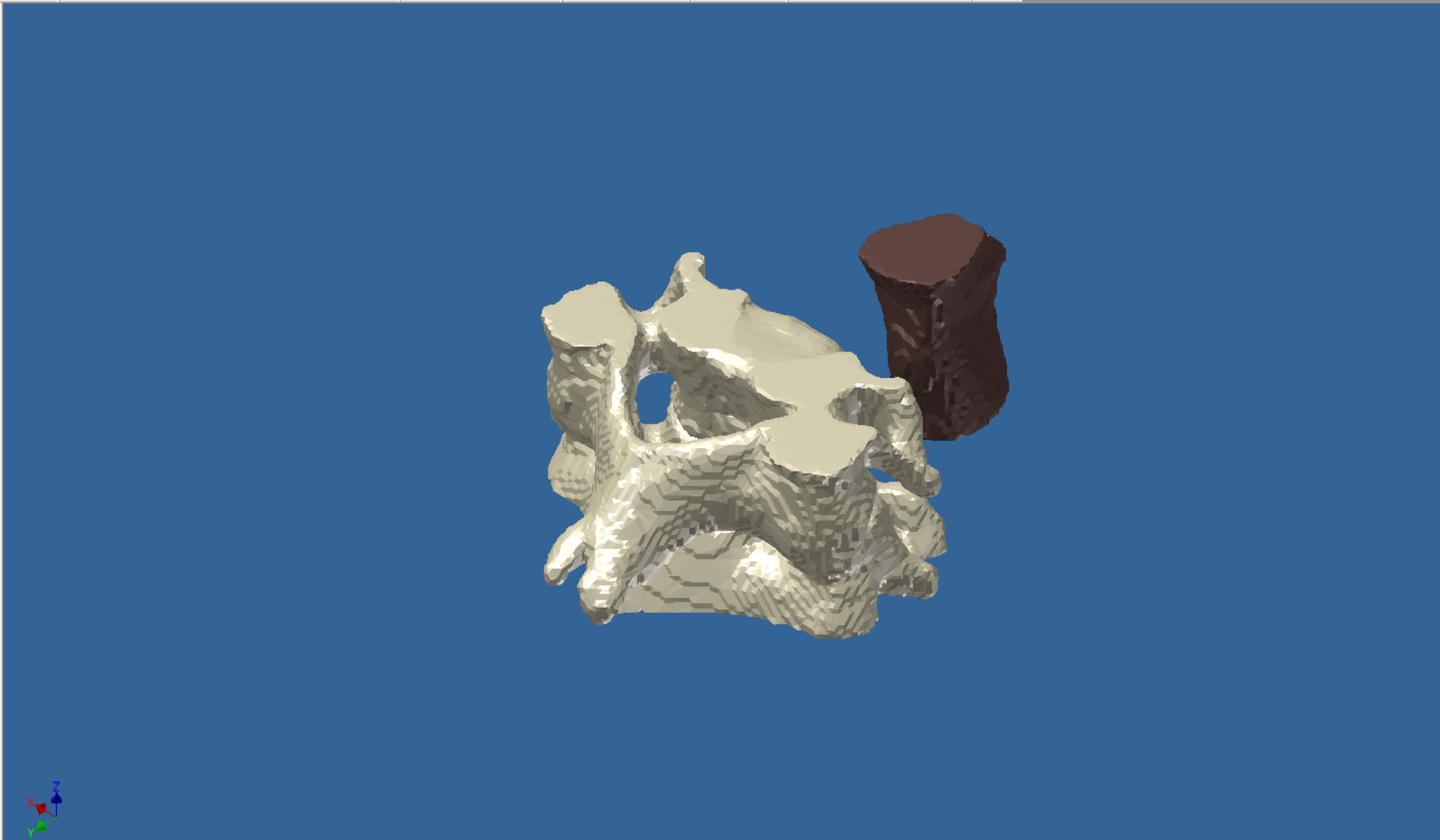
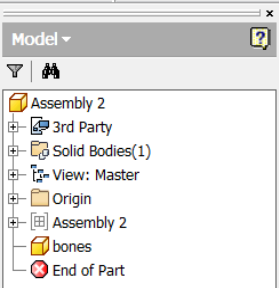
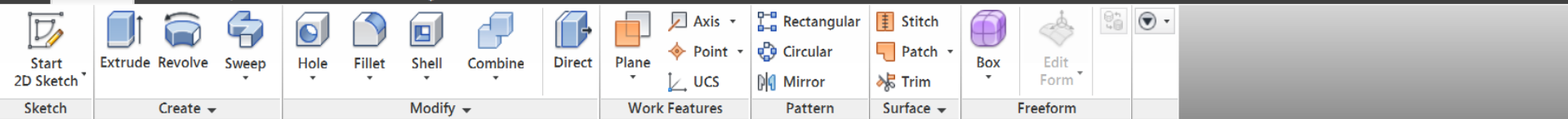
Phantoms



Software

# WHY US?



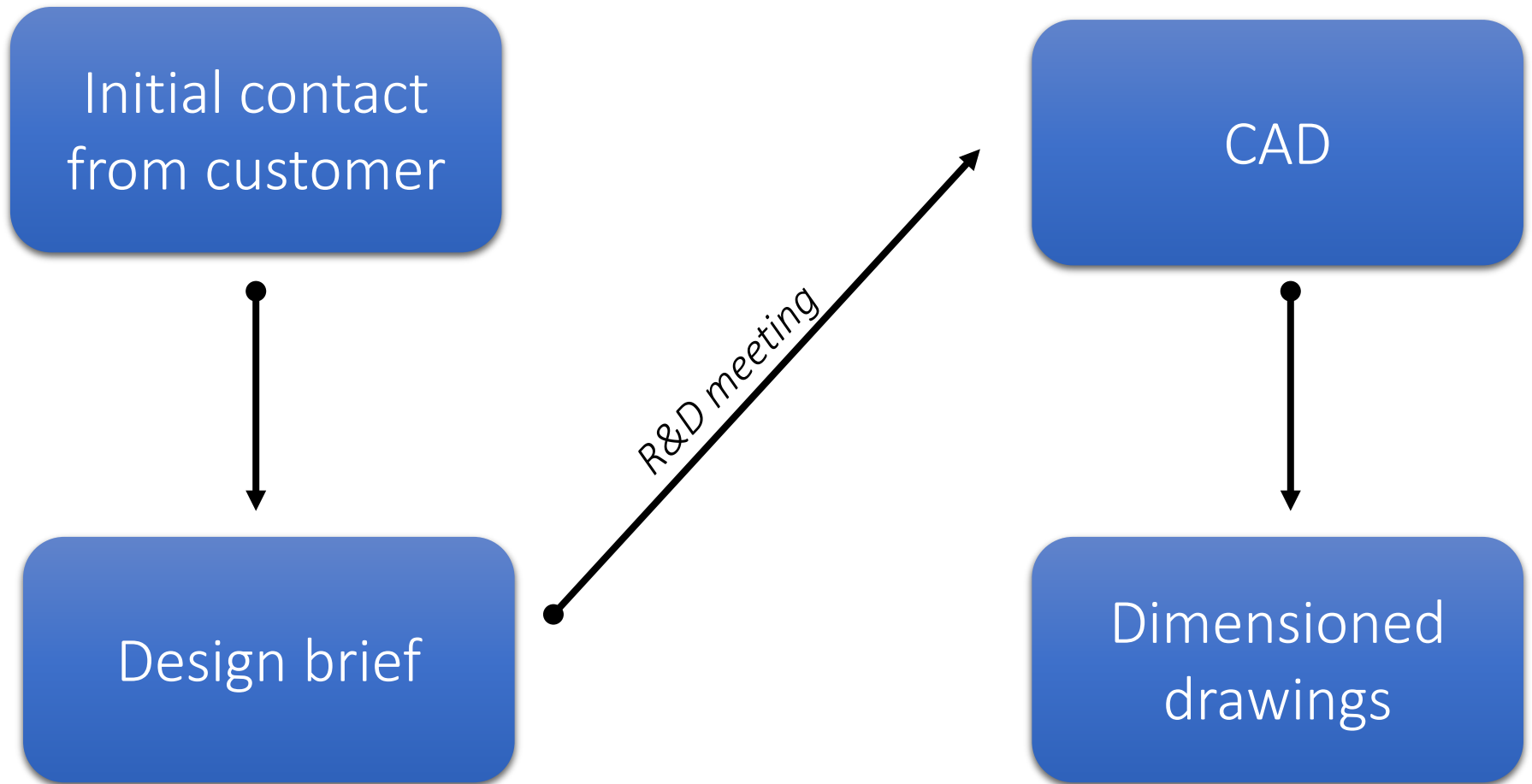




# Tissue equivalents

We're always adapting to using new materials and are soon due to have a Tissue equivalent materials Lab.

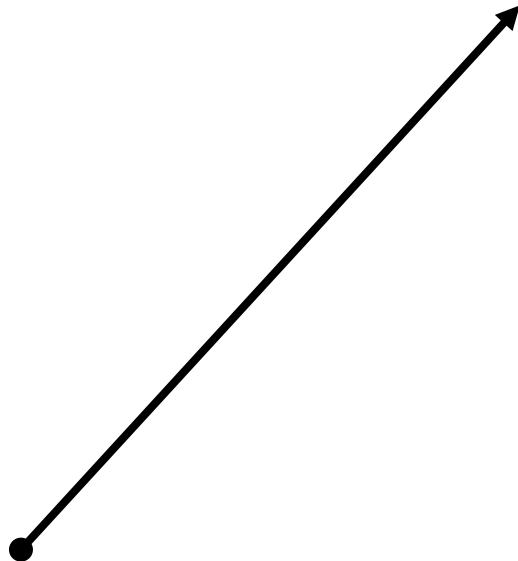
# BESPOKE PHANTOMS



Customer  
feedback



Approval



Quote



Manufacture

# CASE STUDIES

Breast CT

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CTDI Hanger

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PET CT MR Cubes

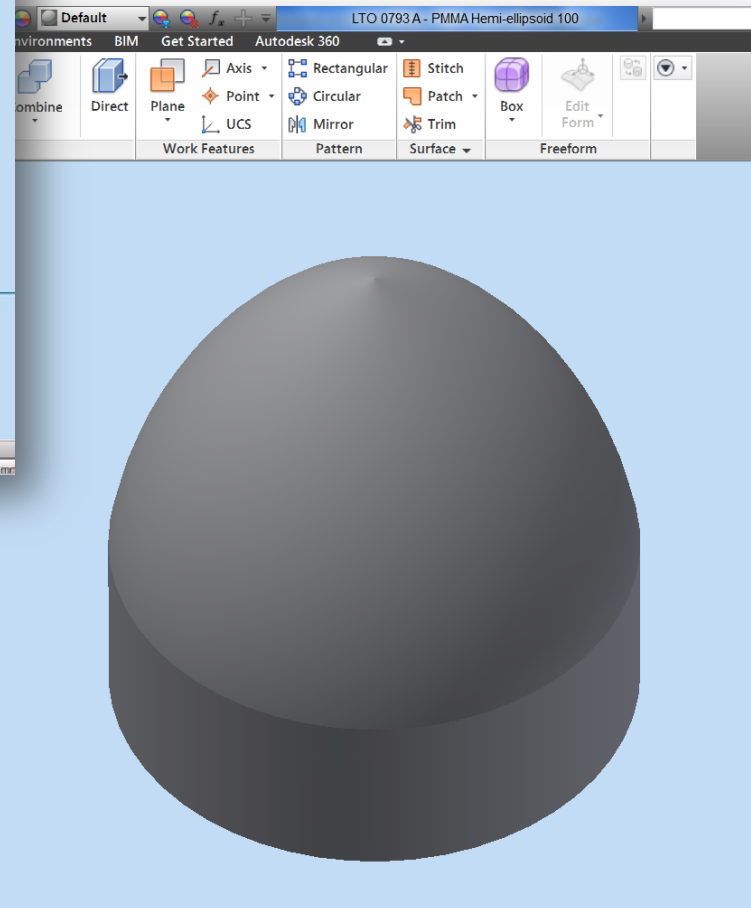
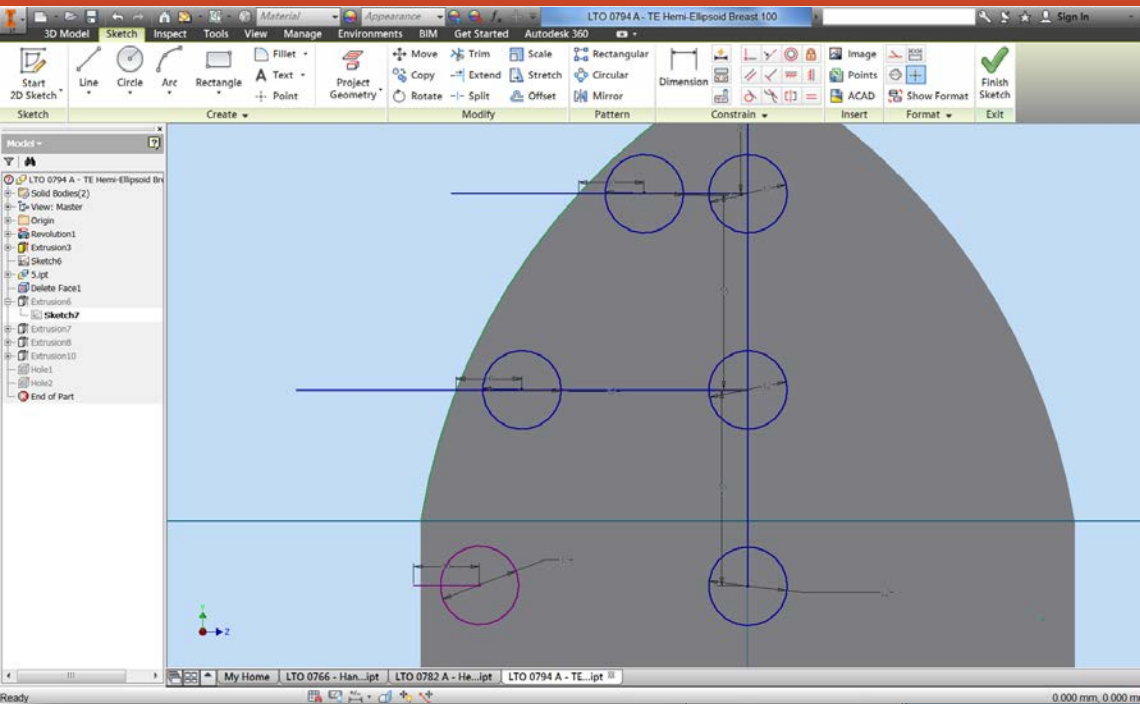
# Breast CT

## Scatter Correction in Cone-Beam Breast Computed Tomography: Simulations and Experiments

**Abstract**—In Cone-Beam Computed Tomography (CBCT) the X-ray scatter control and reduction is one of the major challenges because CBCT is less immune to scatter than fan-beam CT. In breast volume imaging, studies on Cone-Beam Breast Computed Tomography (CBBCT) have shown the necessity to implement an efficient scatter reduction technique for a successful implementation of a breast CT scan using cone-beam geometry. X-ray scatter reduces image contrast, increases image noise and introduces reconstruction artifacts. A method for scatter evaluation through Monte Carlo simulations is investigated, leading to a scatter correction procedure applied to measured projections via subtraction of the simulated scatter component. Simulations are compared with measurements performed with a CBBCT prototype scanner. This paper presents the evaluation of the method through phantom studies on a cylindrical and on a hemi-ellipsoidal PMMA test object of 120- or 140-mm diameter at its base, simulating the pendant breast. The results indicate that this correction method is effective to reduce and correct X-ray scatter, with no increase of noise in the CT images. The cupping artifact due to scatter was reduced by a factor 3 (from 23% to 7%) for the hemi-ellipsoidal

the entire Field-of-View (FOV) of interest. The development of flat-panel detectors and other imaging devices has given rise to numerous cone-beam CT systems for many different applications [1]–[6].

Among these applications, the development of research/clinical CBCT scanners dedicated to female breast X-ray imaging (Cone-Beam Breast Computed Tomography, CBBCT) has been explored as a potential strategy for breast cancer screening and diagnosis [7]–[12], [50], [13]. This emerging imaging technology might provide a better visualization and diagnosis of early stage breast cancer thanks to fully 3D visualization of breast anatomy. Clinical trials [14]–[16] ongoing at two large University medical centers (University of California, Davis and University of Rochester) have shown the great potential of this experimental imaging technique, despite nontrivial technological aspects in the realization of high performance dedicated scanners and in the artifact-free cone-beam CT reconstruction



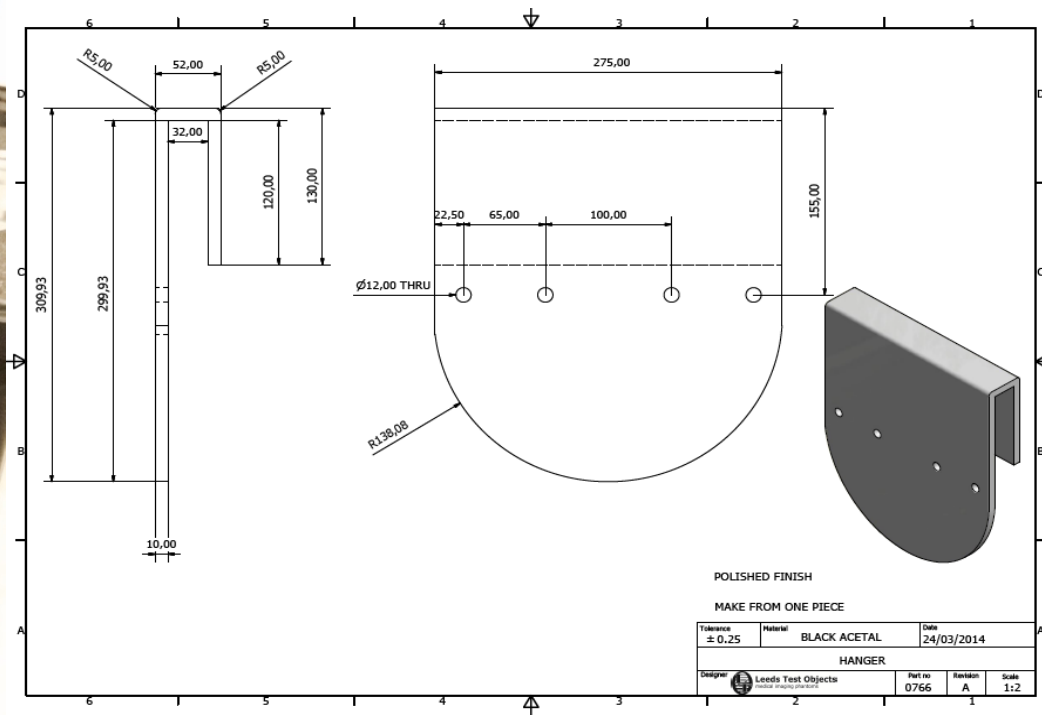


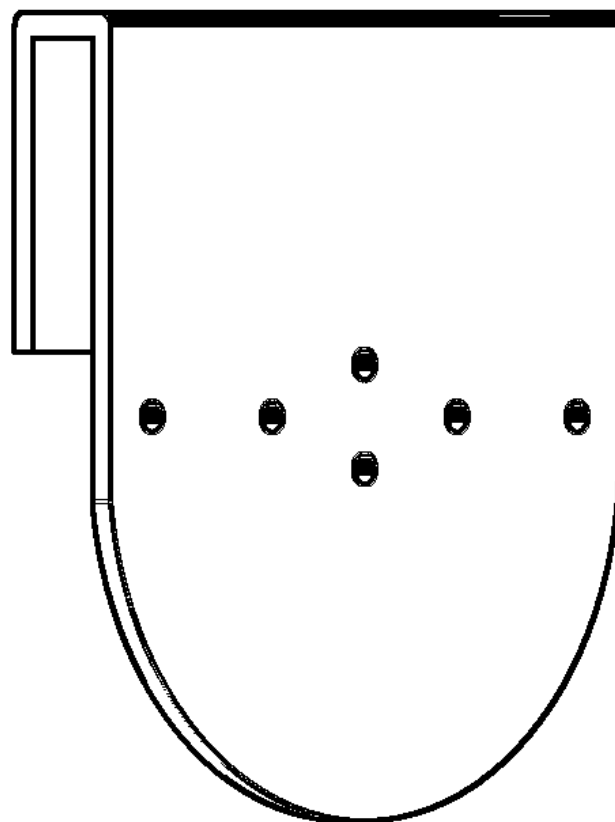


# CTDI Hanger

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A physicist struggled to centre the CTDI in the scan field without attenuation from the couch. A made to measure CTDI holder was manufactured to hang off the edge of the case.



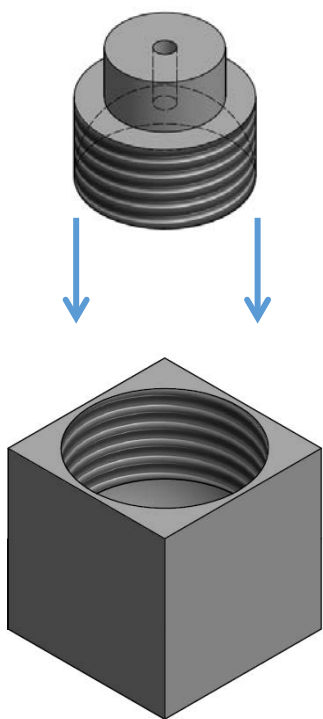




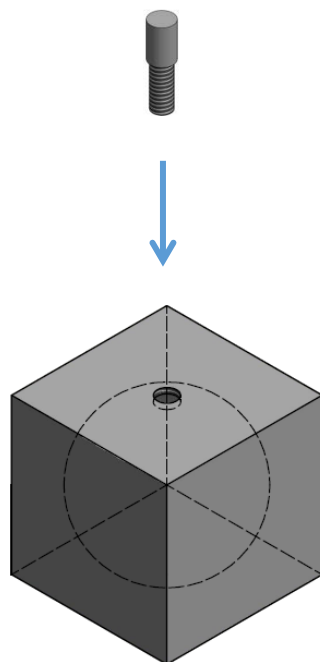


# PET CT MR cubes

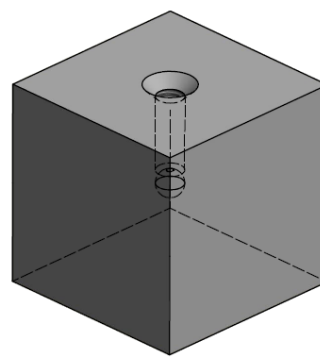
Fillable spheres. We design modular products. This is also going to be useful on our 4DCT phantom.



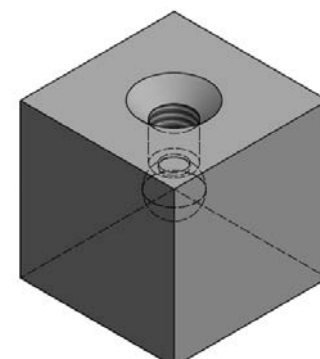
**1.**



**2.**



**3.**



**4.**



**Thank you**

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