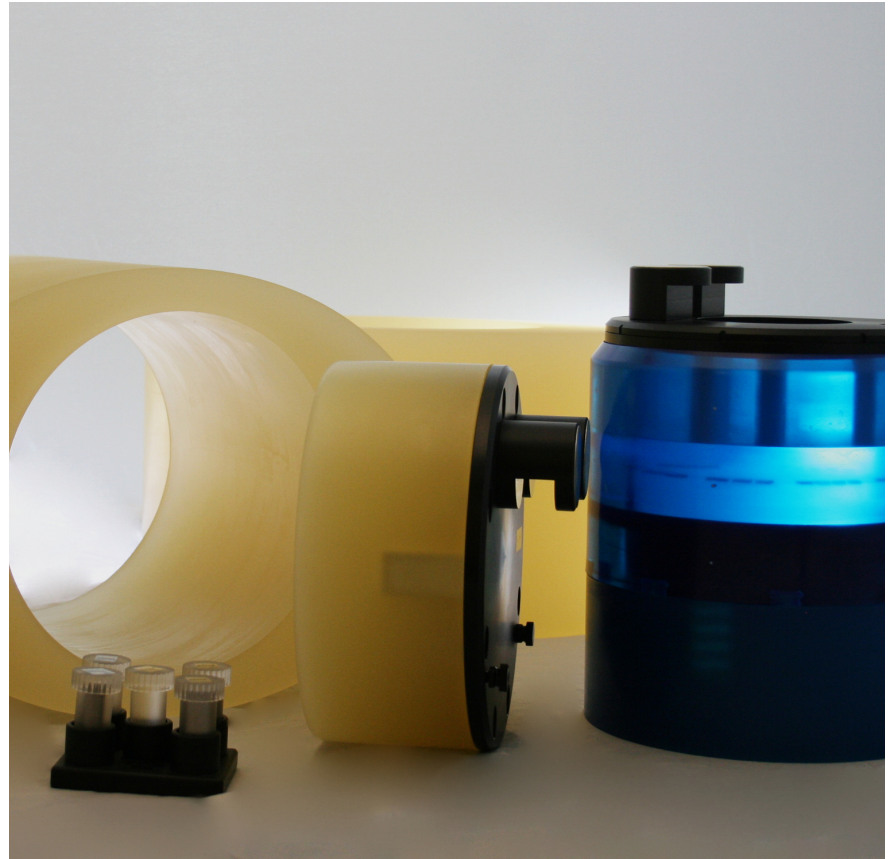


## Comprehensive CT Image Quality Testing set

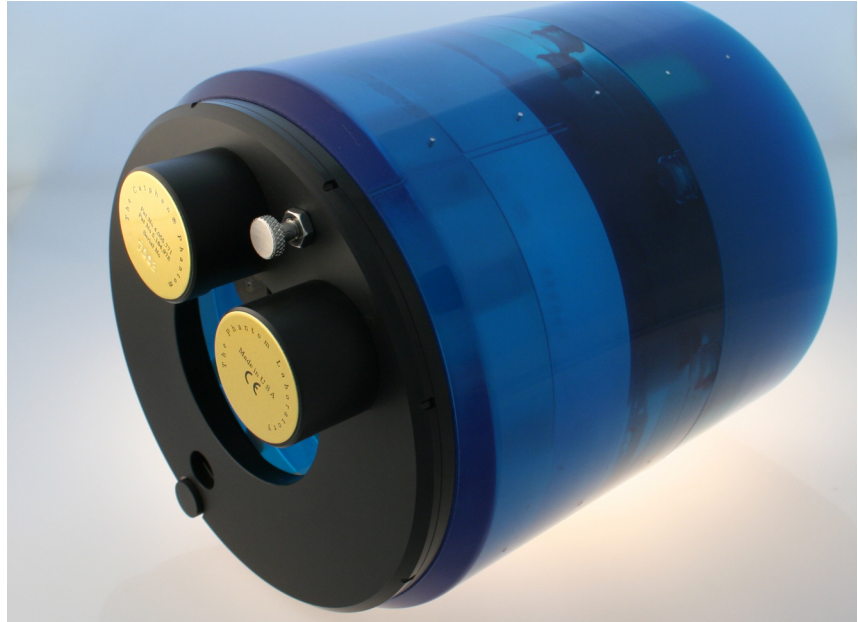
Catphan® 710  
CTP710



The Catphan® 710 set is ideal for physicists wanting extensive capabilities in testing modern CT scanners. The set provides tools for comprehensive evaluations of CT image quality and corresponding test data to help physicists and radiologists understand and select optimal imaging protocols. Below is a list of the products contained in this set.

The Phantom Laboratory

## CTP700 Catphan® 700



The Catphan® 700 is designed to address the image performance measurement requirements for state-of-the-art CT volume scanners. David Goodenough, Ph.D. utilized his 35 years of CT image quality research and testing experience to guide us through the research and development of the Catphan® 700.

The phantom retains many of the tests and features offered in the other Catphan® models, including the CTP515 low contrast test module and integrated case mounting system. Other test objects have been refined in this development including the addition of higher resolution test patterns in the new 1 to 30 line pair per centimeter test module, the addition of smaller acrylic spheres to our low contrast sphere array contained in the sensitometry slice geometry module, and additional bone and lung samples to assist customers using CT images for radiation therapy treatment planning.

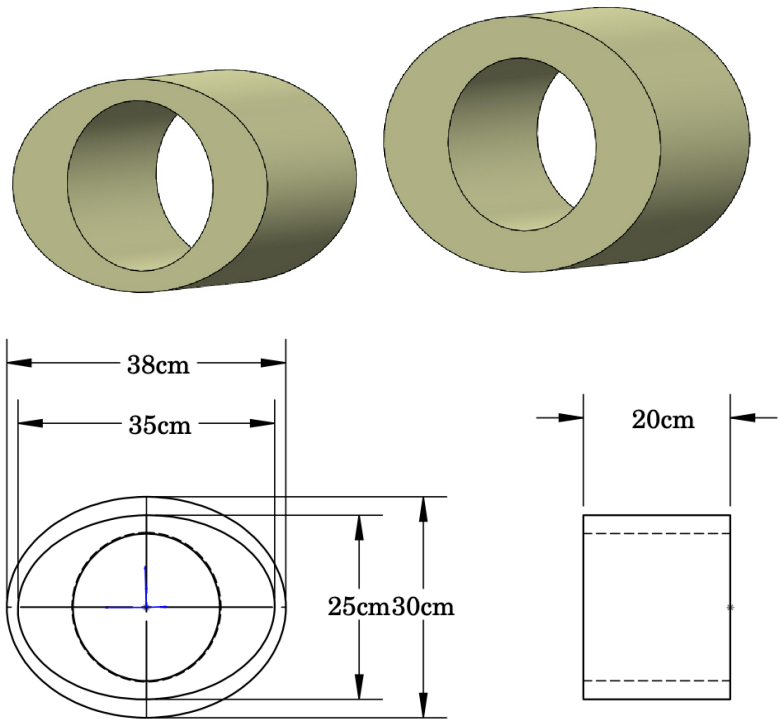
Additionally, the phantom also contains the new wave insert for measuring slice geometry and resolution across the scan area. To address possible variables due to test pattern orientation with the scanners x and y axis, the phantom has a new rotation mount enabling the mounted phantom to be rotated 360° with detents at 45° intervals.

For a full description of the Catphan® 700 please see the Catphan® 700 Data Sheet.

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## CTP579-20 and CTP651-20 Body Annuli



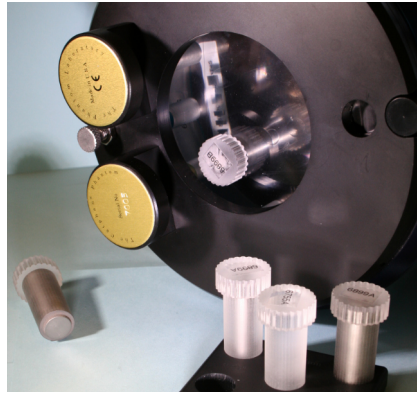
To better understand the performance of a CT scanner with different body sized imaging, the set includes an oval 25cm x 35cm annuli which simulates a large patient and the 30cm x 38cm oval annuli which simulates an extra-large patient. Both the annuli are 20cm in length so they cover the complete phantom and are wide enough for high volume scanners.

The phantoms are cast from our durable uniformity material. After placing the annuli on the patient couch, the Catphan® 700 can be slid into the annuli for scanning.

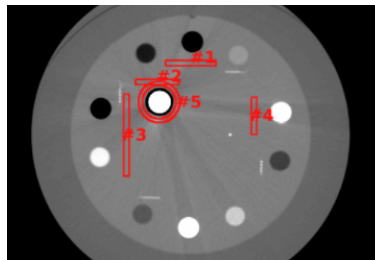
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## CTP748 High Density Insert Set



Most scanner manufactures now offer post processing algorithms to reduce image artifacts from metal inside the patient. The High Density Insert Set contains 2 titanium and 2 stainless steel inserts, each at 6.35mm and 12.7mm in diameter. By inserting these into the Catphan® 700's CTP682 module, streaks are created between the metal artifact and the module's sensitometry targets.



Images of the CTP682 module with these inserts can be analyzed using the Smári Analysis Service. The service records values in 5 defined regions of interest of the image containing streaking paths. In each area, the mean, standard deviation, and range are recorded. By comparing this data, the effectiveness of streak reduction processing can be evaluated.

The image above shows the 5 regions of interest and below is the Smári report. Along with this information, the Smári report provides a comprehensive report based on measurements made from the Catphan® 700 images.

Image Number	Target size (small or large)	Max pixel value
4	Large	69

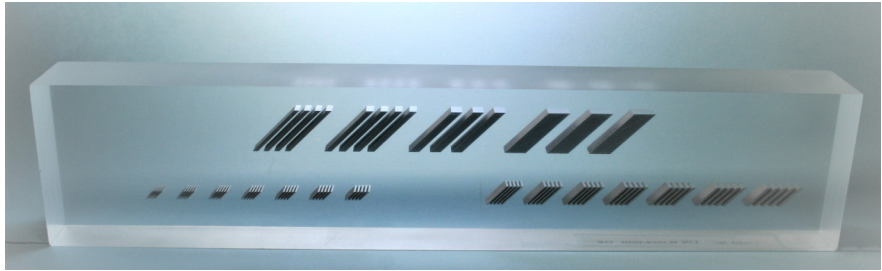
ROI#	Mean	SD	Range
ROI #1	58.0	2.77	16.0
ROI #2	58.6	2.65	15.0
ROI #3	59.1	2.66	17.0
ROI #4	58.0	2.88	18.0
ROI #5	58.6	2.88	19.0

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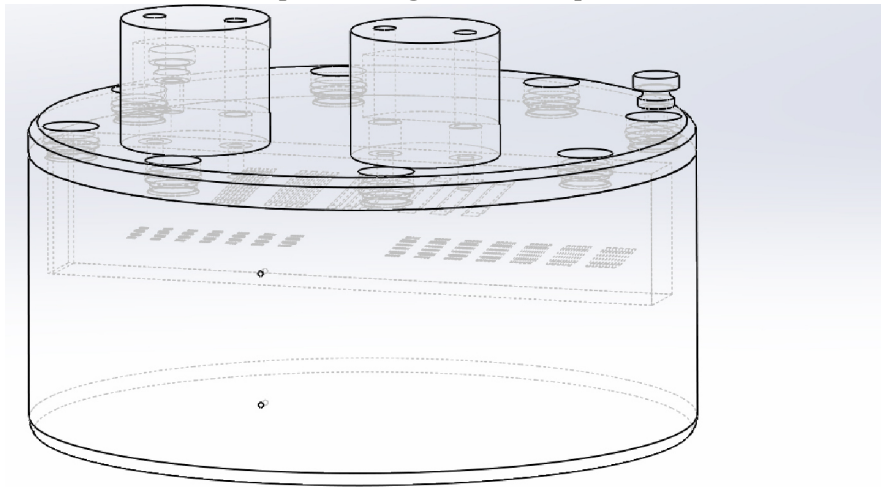
Catphan® 710 Comprehensive CT Image Quality Testing Set

## CCT287 45° High Resolution Gauge and Uniformity Holder

The patented 45° High Resolution Gauge is designed to illustrate the 3-D volume resolution of a CT scanner at a specific imaging protocol.



3-D resolution is important when using CT for volume measurements or modeling, such as radiation therapy treatment planning or building patient matched prosthetic devices. This can be used to evaluate the manufacturer's developments of greater isotropic resolution.



Analyzing CT images of the wave insert in the Catphan® 700 with the FFT function mathematically illustrates 3-D resolution by reporting critical frequencies. The 45° gauge provides an easy to comprehend visual representation of a scanner's 3D resolution. This is helpful when working with other medical personnel in optimizing imaging protocols.

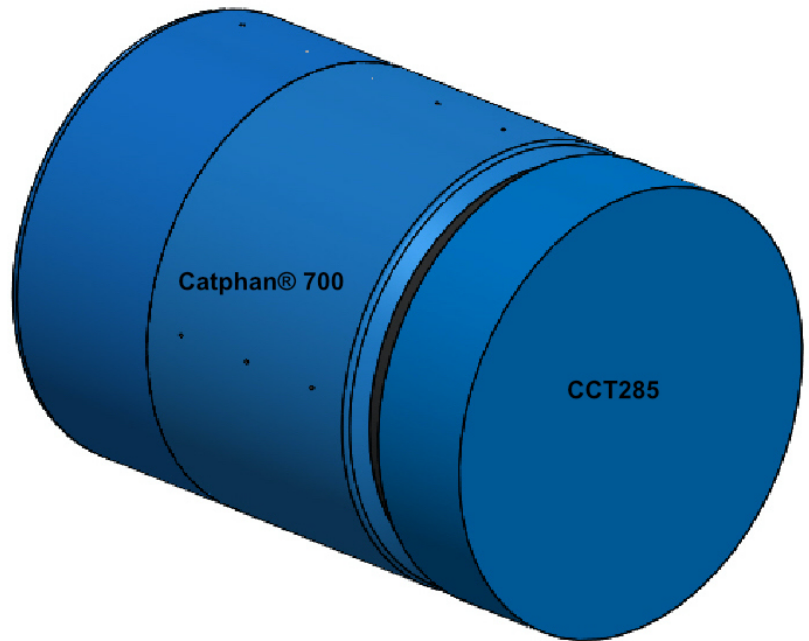
Traditionally, we have measured 2-D resolution and then slice thickness or a slice sensitivity profile for the third dimension. The 45° Resolution Gauge provides a simple evaluation that reflects both of these measurements. This is very helpful when selecting protocols and trying to understand the influence of imaging protocols such as reconstruction filter, slice thickness, and spiral pitch on the voxel size and precision.

The 45° Resolution Gauge contains 3 aluminum gauge sections in a 40mm x 190mm x 20mm clear urethane object. The gauge which is the same size as the wave insert is mounted in a uniformity housing with its own mount.

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## CCT285 Scatter Extension



With wide beam CT, measurements of the sensitometry targets are affected by scatter from the beam passing through adjacent slices. Since the sensitometry with water vial port is located towards the end of the Catphan® 700, wide beam scans could have different sensitometry values resulting from variations in scatter. The scatter extension provides additional material at the end of the phantom, providing a wide volume for beam scatter. The CCT285 is inserted onto the mount end of the Catphan® 700 which can be placed on the patient table or inserted into a body annulus.

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### **Smári Analysis Service**

The Smári image analysis service provides automated phantom image analysis in the cloud. Results can be viewed online or exported. Smári maintains measurements in a database for trend analysis, machine comparisons, and historical records. The CTP710 includes 5 years of service.

### **For more information on the Catphan® 710 set, contact:**

The Phantom Laboratory  
email: [info@phantomlab.com](mailto:info@phantomlab.com)  
Phone: 518-692-1190

[www.phantomlab.com](http://www.phantomlab.com)

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