



SEDENTEXCT IQ

DENTAL CBCT

A PMMA cylinder (160 mm diameter) with recesses to house test inserts (fig. 1). Within the body of the cylinder are features for the following tests;

Noise/Uniformity

- The lower section of the phantom is uniform PMMA (density 1.20 +/- 1.00%)

Geometric Distortion

- An array of 2.0 mm diameter, 3.0 mm deep Air gaps are uniformly pitched through one slice of the cylinder



Test Inserts are included to perform the following measurements:

Spatial Resolution

- Line Spread Function (LSF) - PMMA/PTFE interface (fig. 2)
- Point Spread Function (PSF) - 0.25mm diameter stainless steel wire suspended in air (fig. 3)
- LP/mm - alternating Aluminium/polymer (XY) (1.0 to 5.0 LP/mm) (fig. 4)
- LP/mm - alternating Aluminium/polymer (Z) (1.0 to 5.0 LP/mm) (fig. 5)

Contrast Resolution (fig. 6)

- 1.0, 2.0, 3.0, 4.0, 5.0 mm diameter PTFE, delrin, LDPE, Aluminium, Air, Water (PMMA) rods suspended in PMMA

Pixel intensity (fig. 7)

- 10.0 mm diameter PTFE, delrin, LDPE, Aluminium, Air, Water (PMMA) rods suspended in PMMA

Beam Hardening Artefacts (fig. 8)

- A line of three 5.0 mm diameter rods of Ti suspended in PMMA

Blank PMMA insert (fig. 9)

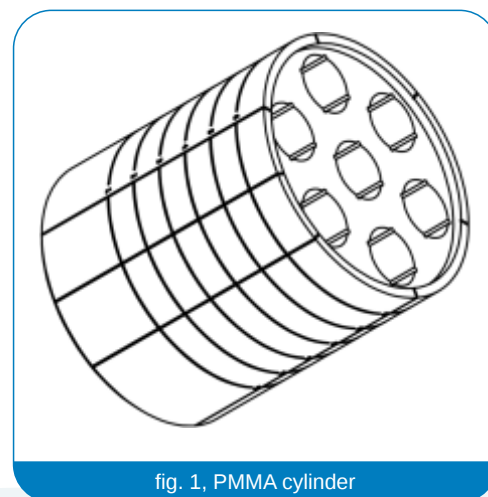


fig. 1, PMMA cylinder

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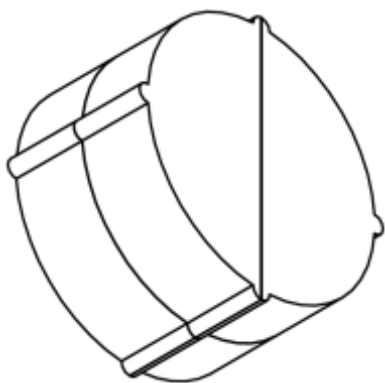


fig. 2, LSF Line Spread Function

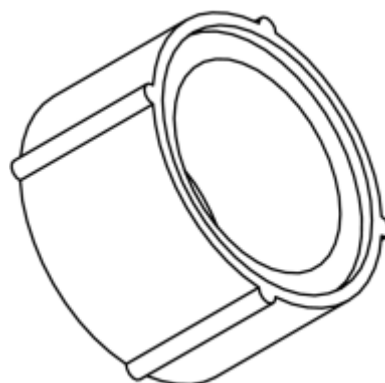


fig. 3, PSF Point Spread Function

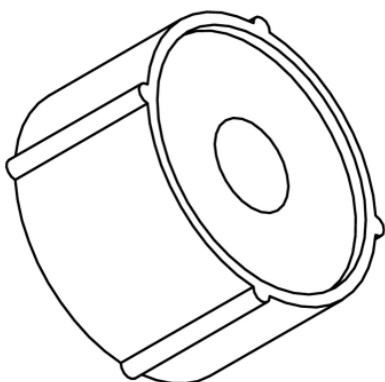


fig. 4, LP/mm Spatial Resolution (XY)

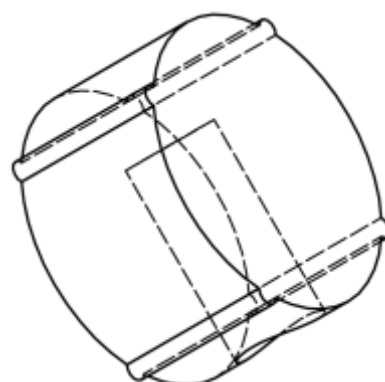


fig. 5, LP/mm Spatial Resolution (Z)

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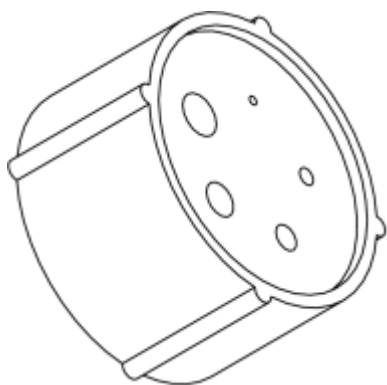


fig. 6, Contrast Resolution

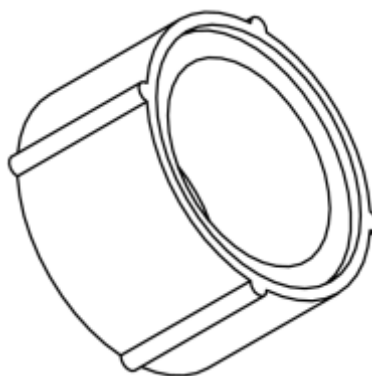


fig. 7, Pixel Intensity

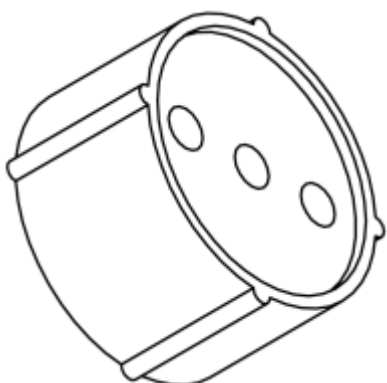


fig. 8, Artefacts

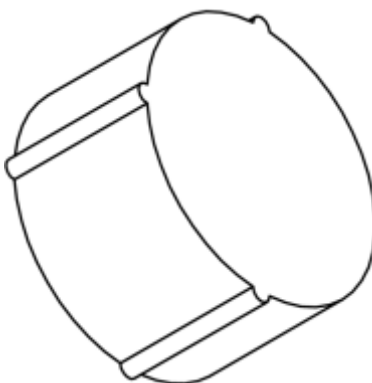


fig. 9, Blank PMMA insert

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SEDENTEXCT IQ

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PMMA cylinder



7 insert columns labelled A to G

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SEDENTEXCT IQ

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7 insert columns (6 peripheral, 1 central)



6 layers of inserts (labelled 1 to 6)

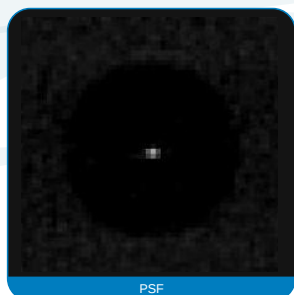
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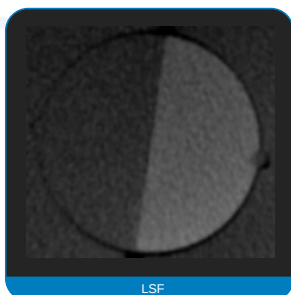


SEDENTEXCT IQ

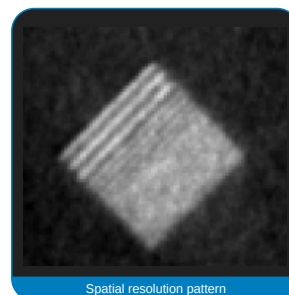
DENTAL CBCT



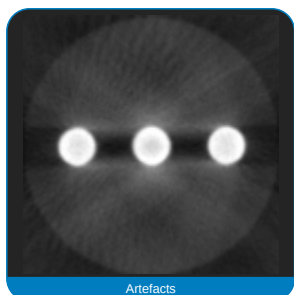
PSF



LSF



Spatial resolution pattern



Artefacts

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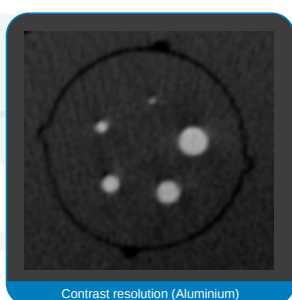
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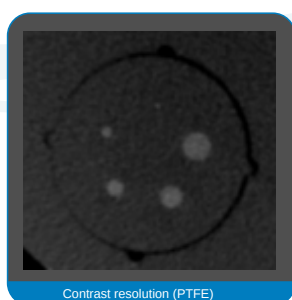


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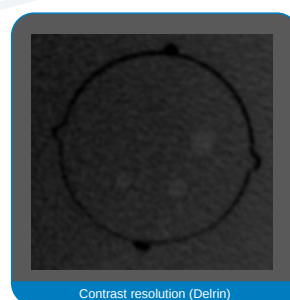
DENTAL CBCT



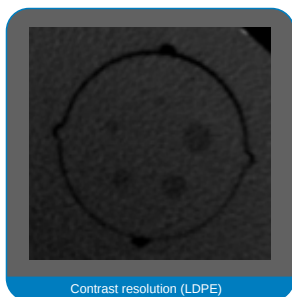
Contrast resolution (Aluminium)



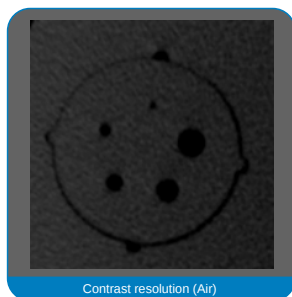
Contrast resolution (PTFE)



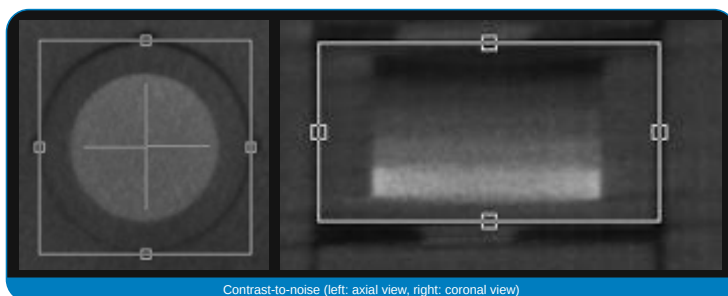
Contrast resolution (Delrin)



Contrast resolution (LDPE)



Contrast resolution (Air)



Contrast-to-noise (left: axial view, right: coronal view)

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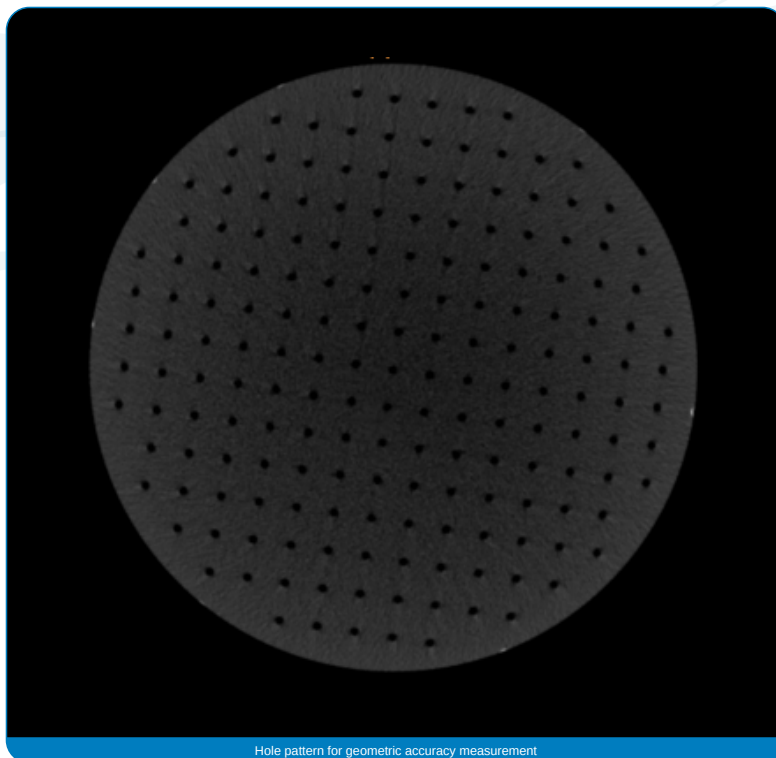
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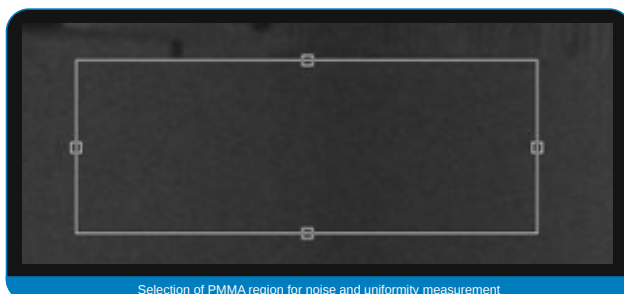


SEDENTEXCT IQ

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Hole pattern for geometric accuracy measurement



Selection of PMMA region for noise and uniformity measurement

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