

Manufacturer's Recommendations for Alternate Dental CBCT QA Program

Acteon Group: Model X-Mind Prime

Table 6

Medical Physicist's Computed Tomography QC Survey

Item	Required Test or Procedure	Frequency	Substitute Test or Procedure	Standard
1	Scan Increment Accuracy	Initial & Annually	None – Not Applicable	None – Not Applicable
2	Scan Localization Light Accuracy	Initial & Annually	X-Mind Prime 3D User Manual 7.3 Laser alignment check Page: 48 (Appendix A)	Check that the mid-sagittal laser beam is aligned to the reference line of the support plate (± 3 mm).
3	Patient Dose (Multiple Scan Average Dose) MSAD or Computed Tomography Dose Index-CTDI	Initial & Annually	X-Mind Prime 3D User Manual 6.8 CTDI Information Pages: 42 to 44 (Appendix A)	Maximum deviation from the nominal values in the preceding tables is $\pm 25\%$
4	Pre-Patient Collimation Accuracy	Initial & Annually	X-Mind Prime 3D Service Manual 8.7 X-Ray beam alignment check Pages: 118 & 119 (Appendix B)	The x-ray beam is correctly aligned if a white border is visible on each side of the image
5	Contrast Scale	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.4 Contrast to noise ratio 7.5.5 Spatial Resolution Pages: 53 to 59, 62 (Appendix A)	Contrast ≥ 400 MTF _{10%} ≥ 1 lp/mm
6	CT Number for Water	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.6 CT number Pages: 53 to 57, 59 & 62 (Appendix A)	The mean and standard deviation of the gray levels inside the area are displayed. The mean value must be in the range from -100 to +100 HU.
7	Slice Thickness	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.8 Slice Thickness	Verify that the Slice thickness value displayed is in the range from 15.3mm to 18.7mm (nominal 17.0mm).

			Pages: 53 to 57, 60 & 62 (Appendix A)	
8	Field Uniformity	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.9 Homogeneity Pages: 53 to 57, 60 & 62 (Appendix A)	The measurement will be performed automatically. Homogeneity ≥ 5
9	Low Contrast Resolution	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.4 Contrast to noise ratio Page: 53 to 58, 62 (Appendix A)	Contrast ≥ 400
10	High Contrast Resolution	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.5 Spatial Resolution Pages: 53 to 57, 59 & 62 (Appendix A)	MTF _{10%} ≥ 1 lp/mm
11	Noise	Initial & Annually	X-Mind Prime 3D User Manual 7.5 3D image quality check 7.5.4 Contrast to noise ratio Page: 53 to 58, 62 (Appendix A)	CNR ≥ 4
12	Scan Protocol Review	Initial & Annually	See N.J.A.C. 7:28-22.10(a)	N.J.A.C. 7:28-22.10(a)
13	Review of Facility and Technologist's QC Tests	Initial & Annually	See N.J.A.C. 7:28-22.10(a)	N.J.A.C. 7:28-22.10(a)
14	Physicist Report and Recommendations	Initial & Annually	See N.J.A.C. 7:28-22.10(a)	N.J.A.C. 7:28-22.10(a)