

QA for digital imaging systems

Introduction

These tests should be carried out at approximately three-monthly intervals for intra-oral, panoramic and cephalometric equipment and monthly for cone beam CT equipment. The results of the tests should be entered in the log.

Some larger dental practices, with many intra-oral plates or sensors, may find it easier to check a few of these plates or sensors each week as part of a rolling programme of checks.

Computer screen set up

Before carrying out the tests detailed below, you should ensure that your computer screens used for 'reporting on patients' radiographs are set up correctly, and can be viewed under suitable conditions, as detailed in 'viewing facilities: computer screens'.

1 Tests for intra-oral systems

For these tests you need to identify one or more X-ray sets that will be used to perform the tests. You must however always use the same X-ray set for the same plate or sensor. This will ensure that there is consistency in the doses used for each of the tests. If, at some point, you cannot use this X-ray set (eg the X-ray set is not working or has been replaced) you will need to start a new record.

There are three basic tests to perform, as detailed below. Each plate or sensor will require a unique identifier. For plates this can be written on the back with a permanent ink marker (pressure must not be applied whilst writing on the plate). NB No writing should be made on the front of the plate.

1.1 Visual inspection of the condition of plates and sensors

Purpose

To confirm that your plates and sensors are in good condition.

The test

All plates or sensors should be visually inspected for signs of damage (including the cable for sensors) and for cleanliness. Record the results of your inspection in the log sheet.

1.2 Image uniformity

Purpose

To confirm that your plates and sensors are in good condition and that your sensors and plate reader are working effectively.

The test

- 1 The plates or sensors should be exposed to a low dose (use the child mandibular incisor setting or lower if you can manually adjust the timer) with nothing between the plate or sensor and the X-ray tube and at a set distance apart (usually about 3 cm [the width of a size 2 plate]).

- 2 View the image on your computer screen. There should be a uniform, dark grey image covering the exposed portion of the plate or sensor. Any more-regularly shaped spots, rectangles or lines on the image may indicate that a sensor or plate reader is not functioning correctly. Less-regularly shaped markings on the image will usually indicate damage to the plate or sensor.
- 3 Assess the condition of each plate/sensor, using your own clinical judgement to decide whether or not the uniformity is adequate for diagnostic purposes. To assist you in your judgement, you may wish to compare the image from this test with one from the previous test. The results should be entered in the log sheet.

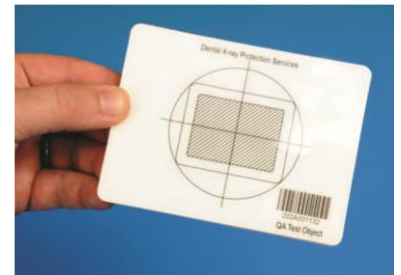
1.3 Image quality

Purpose

To confirm that your digital system can image small changes in the thickness and density of tissue and bone.

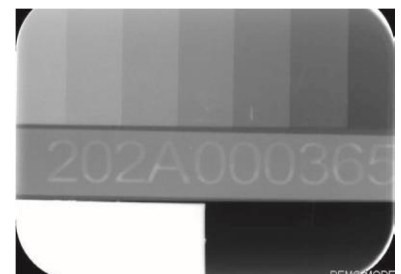
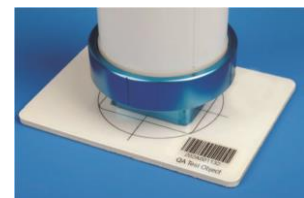
Equipment needed to carry out the test
(in addition to your X-ray set and digital imaging system)

DXPS test object

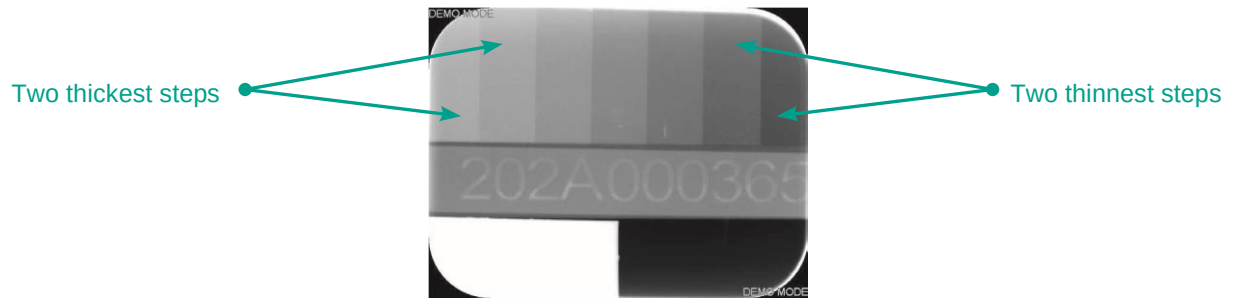


The test

- 1 The test object should be used to expose your plates or sensors. Insert the plate or sensor into the recessed area in the back of the test object, so that the front of the plate or sensor faces the front of the test object (for some sensors it may be necessary to cut off the plastic flap to be able to do this). Blu Tack® or sticky tape may be useful to hold the plate or sensor in place.
- 2 Turn the test object over, ensuring that the plate or sensor remains in position.
- 3 Carry out an exposure of each plate or sensor, with the end of the spacer/director cone in contact with the test object and carefully aligned with the rectangular (or circular) target area. The setting used for these exposures should be that used for an average adult mandibular molar.
- 4 For each plate or sensor view the image resulting from the exposure. The image should show a central area (this may give a serial number but not all objects have this), on one side, a completely white area and a completely black area and, on the other side, a series of steps of different 'density'. If your plate or sensor size is at least size 2 you should be able to see seven steps (you should repeat the exposure if this is not the case). Size 0 or 1 plates or sensors will not have all seven steps visible and you should try to expose the more central steps.



- 5 You should be able to view the 'density' difference between the two *thinnest* steps and between the two *thickest* steps on the image. Initially you may need to adjust the brightness and contrast settings in your imaging software but, if the density differences are still not apparent, you should contact your RPA/MPE.



- 6 Record your assessment of the low contrast sensitivity in the log sheet.