QUART
Quality Assurance in Radiological Technologies

Guideline

for Dose Measurements
at Dental Panoramic Equipment

Reference Measurement of Dose-Width Product

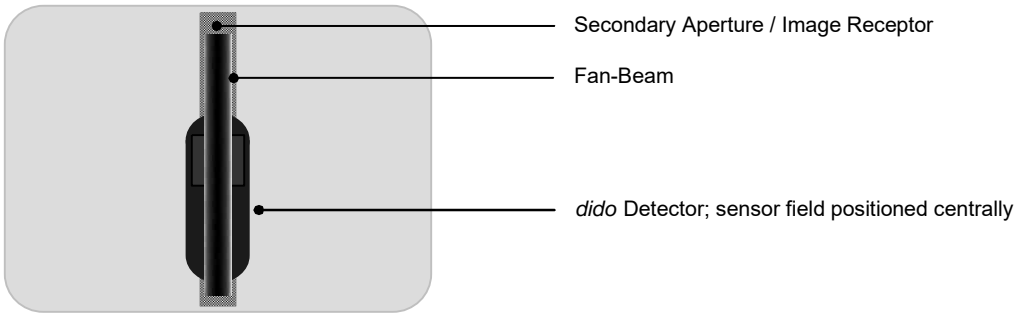
Application Area: Digital & Conventional Panoramic Equipment

Introduction

Due to the technical design of the *QUART dido series* dosimeter detector, the device is able to directly measure the dose-width product (**DWP**) of the fan-beam at dental panoramic units. To acquire the parameter, the position must be correct.

Measurement

1. Position the detector centrally on the secondary aperture, i.e. the image receptor. A very easy and practical way to do that is the use of duct tape.



2. Switch on the meter.

3. Either configure the meter for filtered measurement when using added filtration, e.g. 6mm Al + 0.8 mm copper (for **image receptor dose** measurement). Or, configure the meter for unattenuated measurement (for **patient dose measurement**).

4. Trigger the exposure circle.

5. Read the parameter value from the display. The value represents the integrated DWP for the full panoramic circle. As the display is designed for dose reading, the value needs to be interpreted as this: 6.481 µGy is actually 6.481 µGy*cm. (as the DWP unit is Gy*cm.)

Background

The acquisition of the value through calibrated pencil ionisation chambers calculates the value of air kerma (K) multiplied by a calibration factor (F) and chamber length (L) as specified by the manufacturer. The DWP is there defined as:

DWP [µGy*cm] = K [µGy] x F x L [cm]

For the *QUART dido* Meters, the necessity of any calibration factor is obsolete because their design is based on semi-conductor technology. Due to the sensor size of 1.0 cm (length) by 1.0 cm (width) the DWP is here defined as:

DWP [µGy*cm] = K [µGy] x 1.0 [cm]

Based on this coherence, the displayed value when measured as described above is in fact the true DWP value, e.g. 6.481 µGy means 6.481 µGy*cm.

Note

When compared directly with readings of ionisation chambers, the *dido* values will mostly be lower as the QUART meters measure without any back scatter radiation.

Direct Measurement of Dose

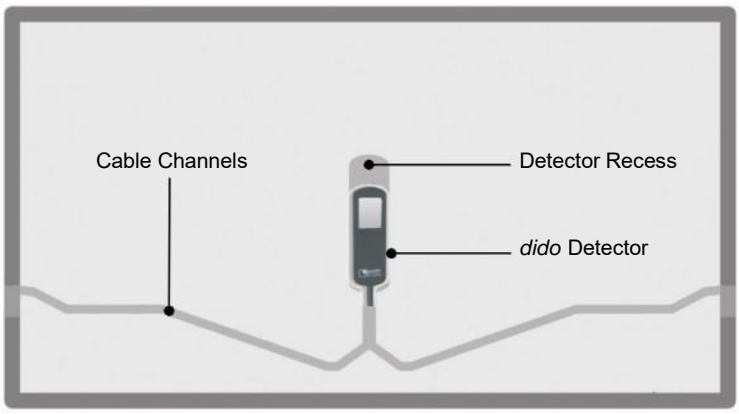
Application Area: Digital & Conventional Panoramic Equipment

Introduction

At dental panoramic systems using moving film-screen cassettes or moving digital storage screen cassettes, a direct measurement of dose is possible. A special accessory is provided to position the dosemeter detector in image receptor level. This measurement option applies to equipment featuring conventional film-screen as well as digital storage screen image acquisition technology.

Measurement

1. Remove the film-screen or storage screen cassette from the tray.
2. Replace the screen cassette by the *QUART MKdent* Measuring Cassette.
3. Insert the *QUART dido* Detector into the cassette's detector shaped recess and route the cable through the cable channels towards the outside of the measuring cassette.



4. Trigger the panoramic exposure.
5. Read the dose value from the display.

Background

The detector in the measuring cassette is positioned in the area of the panoramic circle where the dose rate (dose) is automatically raised by the machine. This is done to compensate the spine when creating the x-ray image in the rotation. Dose is measured in this area to check this value against the limit value.

As the fan-beam proceeds over the detector in the same way as it would proceed over a film, the measured dose can be directly correlated to the intensity of film exposure, i.e. the occurring grey value.

For additional information and information regarding the products, visit our corporate website.

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