

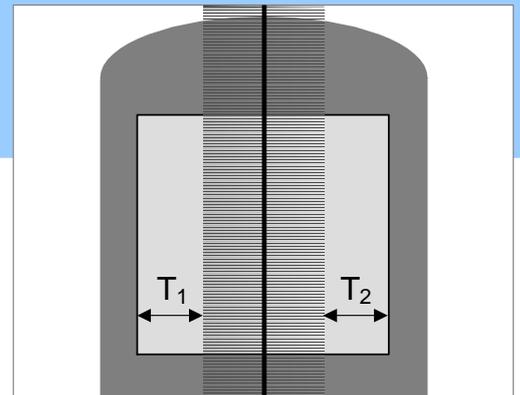
dose-width product
measurement (dental QA)

QUART dido2000K
QUART dido2100K

Recommendations and Standards

Diagnostic dosimeter for DWP measurements (I)

Diagnostic dosimeter for DWP measurements (II)



The dose-width product (DWP)

Facts on an elementary test value for dental Quality Assurance

All dosimeters of the QUART dido series already now fulfil the future requirements of the German standard for dental QA testing DIN V 6868-151 and all respective European standards! This includes the option to measure dose-width product (DWP) at dental panoramic x-ray installations!

Already in 1999 the British National Radiation Protection Board (NRPB) officially introduced a concept of DWP measurement. Since then the concept has been playing an important role in the establishment of diagnostic reference levels (DRL) for dental Quality Assurance. The specified value for DWP, which was suggested in 1999, has been adopted and/or listed by several national and international institutions.

Since its first description several international scientific surveys have broached the issue of DWP measurement as DRL and QA value. Some interesting concepts for the procedure have been outlined in the literature.

dose-width product (unit: Joule*cm/kg or Gy*cm)

The DWP is an integral value. It is the line integral of the air kerma (dose) perpendicular to an x-ray beam over the integrated length (i.e. length of a diode or an ionisation chamber).

Compliances

_ Acceptance testing



V 6868-151 (D)



61223-3-4 (EU)

_ Constancy testing



6868-5 (D)



61223-2-7 (EU)

_ DWP measurement



V 6868-151, App. B (D)

_ DWP as DRL



[65 mGy mm] (1999)



Committee 3 (2001):
Web Module Summary



EC Report 136, Tab. 5.8
(2004)

The QUART concept of dose-width product measurement

The QUART concept to measure DWP for dental QA is based on a suggestion which was outlined and analysed in a scientific article already in 1999. [QUINTESSENZ Nr. 8, 50. Jg. (August 1999), S. 807-811 (German Science and Health Magazine for Dentists)].

The procedure to measure DWP for dental acceptance and constancy testing is described in the German standard DIN V 6868-151, Appendix B.2. Despite being not compulsory as yet, it is currently exercised in daily routine already by manufacturers, dental depots and service experts who put emphasis on proper measurement methodology:

To measure the DWP a linearly specified volume is used. The result is an average DWP value for this specific volume. Inhomogeneities of dose distribution within the width of the volume are not considered.

To acquire the dose-width product value of fanned x-ray beams, the beam must be aligned vertically with the detectors sensitive surface (see fig.). However, there is a slight tolerance margin to the left (T_1) and right (T_2) of about 2 mm. This institutes a reproducible test configuration which provides accurate test results.

The test result is independent from the position of the fanned beam within the sensitive sensor area since the detector geometry is locally isotropic!

Calibration of the DWP test device is done in a homogeneous radiation field which fully radiates the sensor surface. The DWP value then is the true product of sensor length and local dose at this specific position. Due to the extensive detector shielding environmental influence of scattered radiation can be disregarded and neglected.

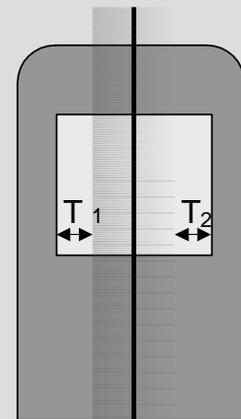


Fig.: Line-up of the fanned x-ray beam towards the sensitive sensor surface

QUART dido2000K

Diagnostic dosimeter for dental, DSA and R+F Quality Assurance



The QUART dido2000K is the first QA device which provides the option to measure dose-width product with a flat detector. Therefore an elementary value for adequate dental QA operations can be acquired quite easily now. Innovative performance solutions - for dental service experts and field engineers.

QUART dido2000K Diagnostic dosimeter with all measurement options
QUART dido2000 Diagnostic dosimeter without kV feature (upgradable)

Art. no.: 11101 (dido2000K)

11104 (dido2000)

Compact Design Concept

QUART dido2100K

Diagnostic dosimeter for mammography, dental, DSA and R+F Quality Assurance



The QUART dido2100K is QUART's top-of-the-line diagnostic dosimeter / voltmeter & DWP meter for most radiographic applications. It is officially approved for QA testing in mammography, radiography, fluoroscopy, DSA and dental applications. The perfect tool for x-ray service experts and manufacturers with a wide product portfolio programme.

The QUART dido2100K also measures the dose-width product at dental panoramic installations. It optimises QA at R+F due to its excellent reproducibility rating and it performs highly reliable half-value layer measurements for mammography because of its improved radiation entrance window.

QUART dido2100K Diagnostic dosimeter with all measurement options

QUART dido2100 Diagnostic dosimeter without kV feature (upgradable)

Art. no.: 11102 (dido2100K)

11105 (dido2100)