

**Worksheet for the determination of the absorbed dose to water
in an electron-beam**

User: **CLINICA AUNA CHICLAYO** Date: **31-Mar-25**

1. Radiation treatment unit and reference conditions for $D_{w,Q}$ determination

Accelerator:	INFINITY CHICLAYO				
Nominal dose rate:	600.0	MU min⁻¹	Nominal energy:	9.000	MeV
Reference phantom:			Measured R_{50} :	3.746	g cm⁻²
Reference field size:	10X10	cm x cm	obtained from		
Beam quality, $Q (R_{50,w})$	3.795	g cm⁻²	Reference SSD:	100	cm
			Ref. depth $z_{ref,w} = 0.6 R_{50} - 0.1$:	2.2	g cm⁻²

2. Ionization chamber and electrometer

Ion. chamber model		Serial No.:	268895004
Chamber wall / window material:	PMMA	thickness:	0.1180 g cm ⁻²
Waterproof sleeve material:		thickness:	g cm ⁻²
Phantom window material:		thickness:	g cm ⁻²

Abs. dose-to-water calibration factor ^a

Calibration quality Q_0 :		Calibration depth:	5.0 g cm ⁻²
If Q_0 is electron beam, give $R_{50,w}$:			
Reference conditions for calibration			
P_0 :	101.3 kPa	T_0 :	20.0 °C
		Rel. humidity:	50 %

Pol. potential V_1 :		V	Calib. polarity:	
			User polarity:	

Calibration laboratory:	LSCD IPEN	Date:	26-Jun-24
Electrometer model:	PC ELECTROMETER	Serial no.:	270267006
Calib. separately from chamber:		Range setting:	
If yes Calibration laboratory:		Date:	

3. Phantom

Water phantom window material:		thickness:		g cm ⁻²
Plastic phantom phantom material:		density:		g cm ⁻³
depth scaling factor c_{pl} :		reference depth $z_{ref,pl} = z_{ref} / c_{pl}$:		g cm ⁻²
fluence scaling factor:		$h_{pl} =$		

4. Dosimetry reading ^b and correction for influence quantities

Uncorrected dosimeter reading at V_1 and user polarity:	12.718				
Corresponding accelerator monitor units:	100	MU			
Ratio of dosimeter reading and monitor units:	$M_1 =$	0.1272			
(i) P :	100.6 kPa	T :	23.5 °C	Rel. humidity:	50 %
					1.0189

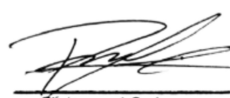
(ii) Electrometer calibration factor $k_{elec} =$

(iii) Polarity correction ^c	rdg at $+V_1$	$M_+ =$	12.718	rdg at $-V_1$:	$M_- =$	-12.722
--	---------------	---------	---------------	-----------------	---------	----------------

1.0002


 Clinicas **auna** | Sede Chiclayo
 JOSE VIDAL VALLADO SALAZAR
 FISICO MEDICO
 LIC. IND. IPEN/OTAN N° 0922-22


 Clinicas **auna**/Sede Chiclayo
 LUIS ENRIQUE QUISPE AYME
 Dosimetrista en Teleterapia.
 Lic. IPEN : 0268-20


 Clinicas **auna** | Sede Chiclayo
 RICARDO PALMA ESPARZA
 FISICO MEDICO
 LIC. IND. IPEN/OTAN N° 8970-22

(iv) Recombination correction (two-voltage method)

Polarizing voltages: V_1 (normal) = -300 V V_2 (reduced) = -150 V
Readings at each V: M_1 = 12.718 M_2 = 12.671
Voltage ratio V_1 / V_2 = 2.0000 Read. ratio M_1 / M_2 = 1.0037
Beam type:
 a_0 = 2.3370 a_1 = -3.6360 a_2 = 2.2990

1.0036^d

Corrected dosimeter reading at the voltage V_1 :

1.3008E-01

5. Absorbed dose to water at the reference depth, z_{ref}

Beam quality correction factor for user quality Q:

If Q_0 is ^{60}Co Table 18 gives

0.922

If Q_0 is electron beam Table 19 gives

Use derived from

If is derived from series of electron beam calibrations

Calibration laboratory:

Date:

9.9549E-03 Gy / MU

6. Absorbed dose rate to water at the depth of dose maximum, z_{max}

Depth of dose maximum: z_{max} = 2.00 g cm⁻²

Percentage depth-dose at z_{ref} for a 10X10 cm x cm field size:

$PDD(z_{ref} = 2.2 \text{ g cm}^{-2})$ = 99.41 %

Absorbed-dose calibration of monitor at z_{max} :

1.0014E-02 Gy / MU

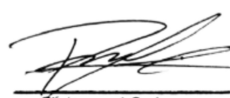
Notes:

300	-150	-300	Voltaje nC
-12.711	12.665	12.717	
-12.723	12.673	12.718	
-12.732	12.674	12.719	

-12.722 12.671 12.718


Clínicas **auna** | Sede Chiclayo
JOSÉ VIDAL VALLADOÑO SALAZAR
FÍSICO MÉDICO
LIC. IND. IPEN/OTAN N° 0927-27


Clínicas **auna**/Sede Chiclayo
LUIS ENRIQUE QUISPE AYME
Dosimetrista en Teleterapia.
Lic. IPEN : 0268-20


Clínicas **auna** | Sede Chiclayo
RICARDO PALMA ESPARZA
FÍSICO MÉDICO
LIC. IND. IPEN/OTAN N° 8970-22

^a Note that if Q_0 is ^{60}Co , is denoted $N_{D,w}$

^b All readings should be checked for leakage and corrected if necessary

^c M in the denominator of k_{pol} denotes reading at the user polarity. Preferably, each reading in the equation should be the average of the ratios of M (or M_+ or M_-) to the reading of an external monitor, M_{em} .

^d Check that

0.004

0.004


Clínicas **auna** | Sede Chiclayo
JOSÉ VIDAL VALLADO SALAZAR
FÍSICO MÉDICO
LIC. IND. IPEN/OTAN N° 0922-22


Clínicas **auna**/Sede Chiclayo
LUIS ENRIQUE QUISPE AYME
Dosimetrísta en Teleterapia.
Lic. IPEN : 0268-20


Clínicas **auna** | Sede Chiclayo
RICARDO PALMA ESPARZA
FÍSICO MÉDICO
LIC. IND. IPEN/OTAN N° 8970-22