



National  
Metrology  
Institute



## Proficiency Test

# Postal beam output audit radiotherapy (BOA-RT)

As a radiotherapy physicist you are aware of the importance of quality assurance for the treatment of patients. The accuracy of the delivered dose is of great importance. Independent dosimetry audits increase the confidence in your dosimetry and the quality of the patient treatment.

VSL offers a postal beam output audit (BOA) as a proficiency test (PT) for verification of your reference dosimetry in terms of absorbed dose to water,  $D_w$ . The subject of the PT in high-energy photon beams is the quantity absorbed dose at 10 cm depth in a water phantom,  $D_w$  in the unit cGy.

VSL organizes the PT services with the highest care. The VSL PT for the postal beam output audit (BOA-RT):

- is accepted by clinical trial organization such as the EORTC.
- is fully compliant with commonly used codes of practice such as that of the IAEA, the NCS and other standardization organizations.
- uses direct metrological traceability to internationally accepted, primary standards of the Netherlands.
- provides a realistic uncertainty for the determination of the absorbed dose to water.
- can be provided on-demand any time by the participant.
- is organised by an expert team, including an expert in radiation dosimetry.
- General requirements for the competence of proficiency testing providers.

### Information about the item to be used:

VSL will send a full-scatter PMMA phantom with radiochromic films.

### Participants capabilities:

The irradiation of the phantom is carried out by local staff in the accelerator facilities of the participant on the same day. It is essential that the participant irradiates the artefact within the agreed time-window and prepares the artefact to be ready for (pre-arranged) pick-up at the agreed location and time.

### Fee:

€ 1.500,00 (including transport and excluding VAT)

The participation fee is including shipping cost in Europe for the items.

Payment in advance.

### Schedule:

The start of the PT can take place within two weeks after request. The PT ends two weeks after the audit-irradiation took place.

### Registration:

Please go to our website [www.vsl.nl/en/services/proficiency-testing](http://www.vsl.nl/en/services/proficiency-testing) to complete the registration form.

## About VSL

VSL, the National Metrology Institute for The Netherlands, is a globally accredited PT provider (ISO/IEC 17043:2010, our scope reg. nr. R006).

Our independent proficiency tests cover a broad range of areas including pressure, mass, viscosity, temperature, electricity, length, chemical analysis, humidity and gas flow. Customers also ask VSL for advice and implementation of custom PTs.

For more information on VSL and our offer, please visit our website at [www.vsl.nl/en/services/proficiency-testing](http://www.vsl.nl/en/services/proficiency-testing). Should you have any questions or wish to join our PTs, feel free to contact us.

### Measurements protocol:

For this PT, VSL provides you with a full-scatter PMMA phantom and radiochromic films. The phantom with films are irradiated by your staff as a water phantom with the detector at 10 cm depth. Your institute reports the absorbed dose to water at this position. The phantom with film is irradiated by local staff with 300 cGy as if it was a water phantom with the detector at 10 cm depth. The methods are straightforward and expected to take less than 10 minutes for a single beam. On return of the audit equipment, VSL analyses and reports the measurement results of the films. The uncertainty VSL's measurement in the audit is 4.2 % ( $k = 2$ ).

The PT is performed at a minimum of four beam qualities in the agreed range of application:  $^{60}\text{Co}$ -photons and MV-photons between 6 MV and 18 MV with flattening filter (FF) or flattening-filter-free (FFF), including MRI-incorporated device (MRI-linacs). Treatment devices such as TomoTherapy™, CyberKnife™ and GammaKnife™ are not covered.

Participants have to perform the irradiation on a single day as agreed beforehand.

### Evaluation:

The evaluation of the audit is based on the normalized error score ( $E_n$ -score). The  $E_n$ -score is determined based on the difference between the reference values and the participants' reported doses considering the specified uncertainties.

### Deliverables:

VSL will deliver a test report including the anonymized measurement results of the comparison.

### Calibration points:

The audit involves a single dose value of 300 cGy at a depth of 10 cm in water.

### Reference laboratory:

VSL, the Dutch National Metrology institute (traceability of the reference values is guaranteed).

### Accreditation:

The organisation of this postal beam output audit (PT) is in accordance with the requirements of the ISO/IEC 17043:2023. Currently this audit/PT is not within the scope of VSL's accreditation (RvA R006). VSL is seeking to extend its scope of accreditation for ISO/IEC 17025:2017 (RvA K999) and ISO/IEC 17043:2023 to cover this service and the associated measurement capabilities. For details regarding our scope and capabilities go to <https://www.rva.nl>

### Confidentiality statement:

VSL keeps all data regarding the performance of individual participants, or groups of participants, strictly confidential. Data is accordingly protected and stored in areas on networks with restricted access. The relationship between results and the laboratories that submitted them will never be disclosed. Only the laboratory is granted access to its performance through the assigned code number.

### VSL

Thijssseweg 11  
2629 JA Delft  
The Netherlands  
**T** +31 (0)15 269 15 00  
**E** [vsl@vsl.nl](mailto:vsl@vsl.nl)  
**W** [www.vsl.nl](http://www.vsl.nl)

CoC: 27.228.703  
TAX: NL800189620B01  
IBAN: NL24ABNA0620273321