



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

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IAEA/WHO POSTAL DOSE QUALITY AUDIT New service For High Energy Electron Beams using RPLDs

We are happy to inform you that as of June 2021 we will be introducing a new reference dosimetry audit service for High Energy Electron Beams for **new installations only**.

The audits will be conducted using the existing radiophotoluminescence dosimetry (RPLD) system, which is also used for photon beam audits. The check is performed by irradiating RPLD capsules in a water phantom using the new universal IAEA RPLD holder. The new holder is made of PMMA and comes with rings of different diameters which make it mountable to Roos-type and Markus-type water tank holders (Fig. 1). The design allows for easy and precise positioning of RPLDs in a water tank at the reference depth corresponding to the energy of the beam tested, according to TRS-398 (Fig. 2).

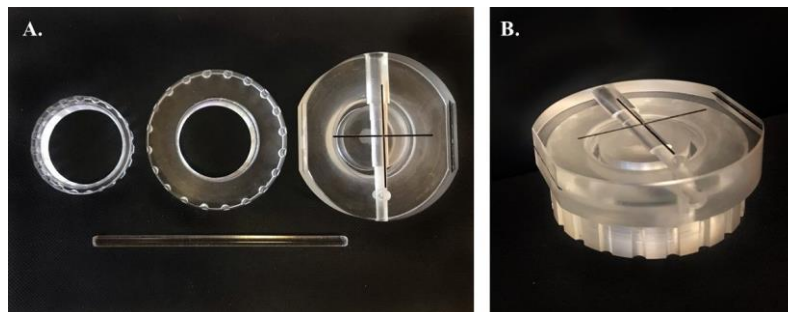


Fig. 1. The universal IAEA holder for RPLD irradiations: (A) Disassembled holder with two rings of different diameters (B) Assembled holder with the ring for the Roos detector holder.

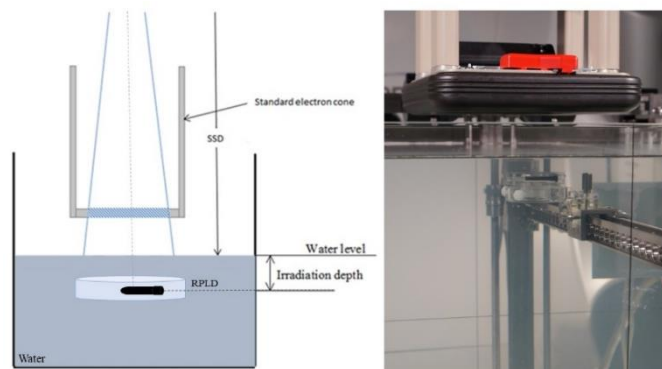


Fig. 2. Geometry set-up for the RPLD irradiation.

To request participation in the electron beam audit, please fill out the application form. The option to choose an electron beam appears for new installations only.

RPLD system used by the IAEA/WHO to operate dosimetry audits

Please note that the IAEA/WHO postal dosimetry audit service switched from using TLDs to RPLDs in 2017. The RPLD system utilizes radiophotoluminescent dosimeters in the form of 12 mm glass rods (Fig. 3). Each rod has a unique identification number (ID) engraved at one of its ends, and it is placed inside a plastic capsule marked with the same ID. The centre of the 6 mm long active volume is marked on the RPLD capsule with a dot.



Fig. 3. RPLD: a protective plastic capsule with ID number and the glass rod.

Glass rods must be kept in their protective capsules at all times in order to avoid dosimeter exposure to dirt and humidity. They should not be touched with bare fingers. The RPLD capsules are waterproof but when opened, the dosimeters may get wet, and the signal can be affected. In case opened, the glass rods must be placed back into their proper capsules with the engraved ID numbers towards the cap in order to make sure the active volume is centered with the marked dot on the capsule.

Glass dosimeters are reusable after annealing but are very expensive. In order to benefit from reuse, **it is crucially important that RPLDs are handled with care. Please make all efforts to return the dosimeters safely to the IAEA Dosimetry Laboratory after irradiation** so that next institutions can get them from us in good shape and benefit from the audit.

If you have questions, please do not hesitate to contact us at dosimetry@iaea.org.