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## External Quality Assurance of Clearance Measurement Systems: Measurement of Comparison Boxes

Method development and quality assurance measurements are of central importance in the operation of clearance measurement systems. The VKTA has a large number of boxes used for calibration and quality assurance. These boxes extend the possibilities of simulation of activity distributions compared with calibration boxes available from the manufacturer of the measuring system. The Radiation Protection Expert Committee of the "Länderausschuss für Atomkernenergie" recommends the use of boxes like used in the VKTA project "Second comparison between selected German clearance measurement systems as a tool for external quality assurance" (report of September 18, 2018).

The use of the comparison boxes can pursue two objectives:

- 1) Carrying out interlaboratory comparisons between several clearance measurement systems, optionally with comparison to results from previous measurements at VKTA and third parties
- 2) Provision of ready-made comparison boxes of known or unknown activity and nuclide composition for development or comparison measurements



The core are comparative boxes of different material composition. On the one hand, they can have a known homogeneous volume contamination. On the other hand, they can be equipped with radiation sources in such a way that different spatial activity distributions can be simulated. This can be done with one or more radionuclides from inhomogeneous to almost homogeneous distributions.

The involvement of the VKTA can range from only packaging the boxes to complete organization of comparative measurement campaigns with subsequent evaluation and comparison with comparable measurements.

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Illustration: Example of a comparison box

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