



Schematic illustration of PTB's mobile X-ray measuring device

Advantages

- on-site detection of X-ray radiation leaks
- 4π sterad profiling range
- easily transportable due to modular construction

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Mobile X-ray Measuring System

During development, certification and intermittently during operation, X-ray sources often have to be characterized. Especially unwanted leakage of radiation is a crucial parameter for the certification of X-ray tube assemblies.

PTB has constructed for its own regulatory task of type testing a mobile X-ray measuring device, to perform reliable on-site dose rate measurements at a fixed distance of 1 m from the focal spot of a X-ray tube.

Technical description

The X-ray measuring device can be disassembled and transported in a normal van. Erected on the three pillars, as shown in the picture, the device becomes a highly precise tracking instrument for the measurement of X-rays. It consists of four sensors riding in the vertical direction on a track, that is slightly larger than a semi-circle. This track can also be rotated horizontally. Vertical and horizontal scans are under the control of an embedded microprocessor.

Thus more than 2π steradian is accessible in one scan. Rotating the X-ray device under test (DUT) by 180° results in a full and overlapping 4π steradian leakage test of the DUT.

The track-segments are connected with highly accurate mechanical interfaces, thus safeguarding low measurement uncertainties. With this system, geometrical construction flaws of X-ray tube assemblies can be detected and located.

Application

PTB has constructed for its own regulatory tasks the described scanning X-ray measuring device and plans to use it for mobile as well as for stationary dose rate measurements of the leakage radiation of X-ray tube assemblies.

Economic significance

The investigation of X-ray sources as well as the detection of possible radiation leaks of the complete assembly is very important in medical, industrial and research applications.

Development status

A first functional prototype of the mobile X-ray measuring device has been tested at PTB. Licenses for mechanical and electronic components are available.

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